

# FEDERAL DISASTER INSURANCE

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## REPORT

OF THE

16. Congress.  
COMMITTEE ON BANKING AND CURRENCY  
UNITED STATES SENATE

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## STAFF STUDY



JANUARY 9, 1956.—Ordered to be printed, with illustrations

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LETTER OF TRANSMITTAL

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UNITED STATES SENATE,  
COMMITTEE ON BANKING AND CURRENCY,  
November 30, 1955.

Hon. J. W. FULBRIGHT,  
*Chairman, Committee on Banking and Currency,  
United States Senate, Washington, D. C.*

DEAR SENATOR FULBRIGHT: At your direction, the staff has prepared background materials relating to consideration of a Federal disaster insurance program. Except for certain deletions and re-arrangements, this compilation was made available to all members of the committee, in substantially its present form, at the beginning of the hearings on October 31, 1955. Since the study was intended to lay the groundwork for the initial phases of the committee's inquiry, it does not generally include information developed during the hearings. Such data will be taken into account in future committee reports.

Limitation of time has restricted the amount of detailed data included and has precluded a more complete analysis of the materials. While the scope of the study includes all natural and manmade disasters, emphasis has been placed on those for which insurance is not readily available (such as floods) and for which information was obtainable in a short period of time from public and private sources. From this committee's own files came much of the material dealing with the problems of war damage—the result of considerable renewed attention given to this phase of the problem since 1950. The committee staff received fine cooperation from the Federal agencies, private organizations, and individuals that were requested to supply data.

The materials included in this study were compiled and prepared by Mr. William F. McKenna, counsel of the committee. Mr. Donald L. Rogers, also counsel of the committee, prepared the chapter on natural disaster relief.

The staff wishes gratefully to acknowledge the contributions of the various Government agencies, private organizations and individuals listed at the end of the study.

ROBERT A. WALLACE, *Staff Director.*

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## FEDERAL DISASTER INSURANCE

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JANUARY 9, 1956.—Ordered to be printed, with illustrations

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Mr. FULBRIGHT, from the Committee on Banking and Currency,  
submitted the following

### R E P O R T

#### I. SUMMARY

##### INTRODUCTION

Periodically man is afflicted by disaster. For certain of these, man is responsible, in some cases using weapons of war that cause disaster. Others result from the forces of nature without man's intervention. Among the latter, some are creeping, such as drought; others strike with sudden violence. Some, such as floods, have been known to occur since earliest recorded history. Others, such as the dangers of contamination of the atmosphere by smog, and, more recently, radioactive materials, are byproducts of developing technology.

All disasters constitute a potential risk to person and property. Depending upon the area of their occurrence, they may exert an adverse effect upon the economic livelihood of a nation.

The Senate Committee on Banking and Currency has decided to hold hearings on the occurrence and effects of disasters—both natural and manmade. It will attempt to determine what action can and should be taken by the Federal Government in order to lay plans for alleviating financial distress to disaster victims, by means of insurance, indemnity or otherwise.

This study has been undertaken in the realization that private enterprise, through insurance and reinsurance plans, now offers means of avoiding catastrophic financial loss as a result of certain disasters. Notably lacking among these plans of insurance protection, however, is insurance to offset the potential economic loss to property caused by flood, tidal wave, and the water damage accompanying hurricanes, and the potential injury to person and property resulting from the perils of war. For that reason this report will emphasize these phases of the study.

To aid the committee in conducting the proposed hearings, this report has been prepared. It is intended to supply in a convenient form for reference facts concerning certain natural and manmade

disasters. It discusses, briefly, the nature and history of disasters deemed pertinent to this study, and also the damage they have caused. It notes the present availability of insurance coverage for those disasters and points up some of the problems involved in offering insurance against those not now insurable with public or private organizations. The report sets forth relief measures presently in use to offset the ill effects of such disasters, and outlines the part played by the Federal Government in those measures of relief. Past action of the executive and legislative branches of this Government in exploring the feasibility of offering disaster indemnity by means of insurance or some similar program is recorded. Instances of other Federal Government insurance programs that may serve as a framework of reference for any disaster indemnity plan are set out. Within this general scope, possible legislative proposals to offset the evil effects of disasters by advance planning are discussed.

The scope of this study includes many natural and man-made disasters. Most emphasis is placed on disasters against which commercial insurance is not readily available. These are perils generically described by insurers as flood (including flood, high water, tidal waves, and water damage from hurricanes), as well as air pollution from radioactive contaminants and those types of war damage caused by the products of nuclear fission and bacteriological attack. The study is designed to furnish background information regarding the feasibility of plans to provide repair or replacement of or indemnity for presently uninsurable disaster losses.

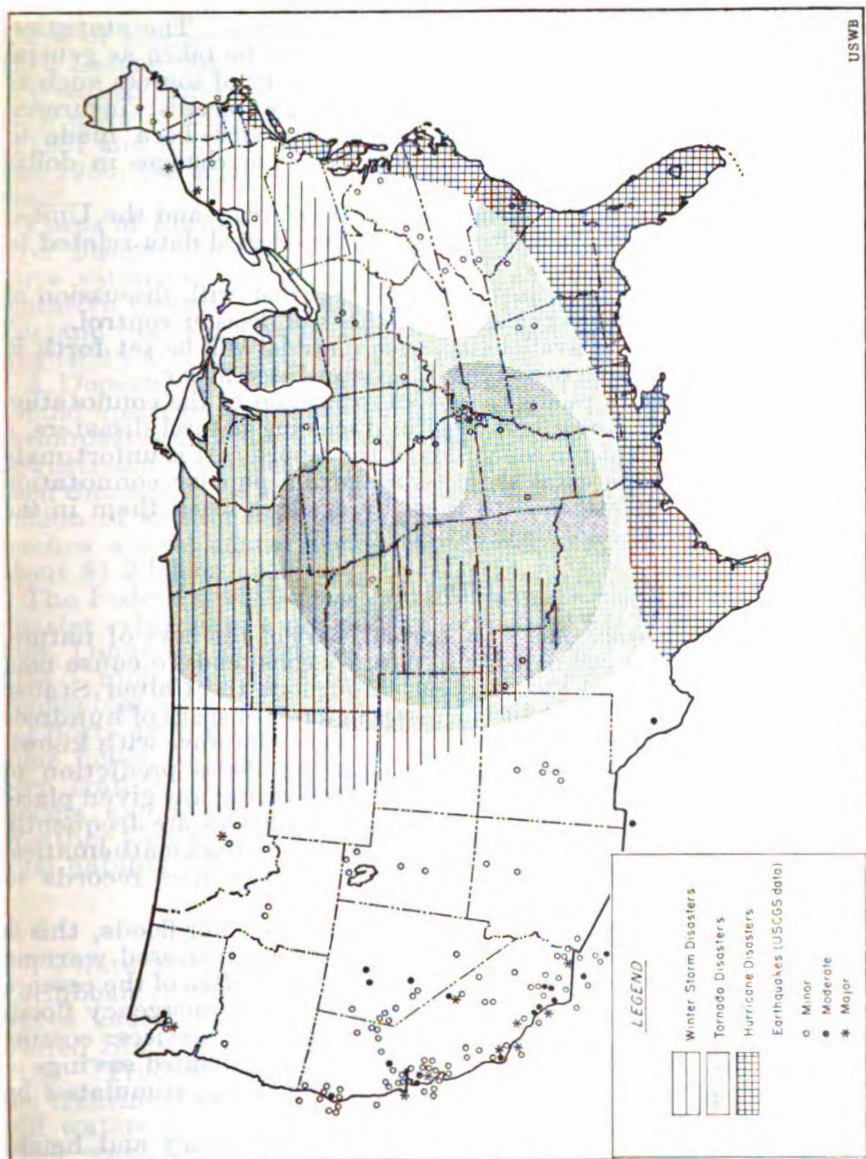
The following will be used as a representative group of natural disasters potentially perilous to man: flood, tidal wave, tropical storm (including hurricane), tornado, severe winter weather (including blizzard, glaze storm, excessive snowfall, severe frost or freeze, and snowslide), duststorm, thunderstorm, hail, earthquake (including landslide), volcano, explosion, and air pollution (including smog and radioactive contamination). Notable exceptions from this list are fire and lightning. They are omitted because private insurance against such hazards is widely available and used. For the other hazards listed, insurance is available from private or public sources to varying degrees; although in the case of floods, tidal waves and water damage from hurricanes such coverage appears to be extremely limited.

In many manifestations, explosion and air pollution are attributable to man's interference with nature. Of the remaining types of natural disasters listed, only earthquakes and volcanoes are not causally connected with what we generically call weather.

As noted by the United States Weather Bureau, disasters primarily caused by weather are unfortunately common occurrences in the United States (see fig. 1). The Bureau comments:

In one form or another, they affect all parts of the country. Some of them have become almost legendary: the Blizzard of '88 (March 12, 1888) with 400 lives lost; the Johnstown Flood (May 31, 1889) which left 3,000 dead in its wake; the hurricane-driven Galveston storm surge (September 8, 1900) which swept at least 6,000 persons into a wet grave. It is even doubtful if Mrs. O'Leary's cow would have gained her infamous reputation as incendiary in the great Chicago fire (October 8, 1871) had it not been for a period of long-persistent drought prior and a high wind just at the time of her kick at the lantern. The same weather circumstances on the same day, incidentally, led to the disastrous Peshtigo fire in Wisconsin.

FIGURE 1. — Incidence of disasters in United States.



The Weather Bureau, as part of its weather-recording functions, has kept some statistics on incidence of weather disasters and the casualties and damages caused by them. The data cover mostly the past few decades. They are presented in a series of figures and tables covering floods, tropical storms (including hurricanes), tornadoes, blizzards and other damaging windstorms. The statistics, particularly on casualties and damages, can only be taken as general estimates. Many of them are based on a variety of sources such as Red Cross reports, newspaper articles, police records, insurance company tallies. As for damages, no attempt has been made to adjust the data for increase in property values or changes in dollar values.

The Corps of Engineers of the United States Army and the United States Department of Agriculture also have collected data related to damage caused by floods.

These will be presented in the report, together with discussion of predictability, warning service, and methods of disaster control.

To the extent of its availability, such material will be set forth in the course of discussing each type of disaster listed above.

For convenience of reference and an exposition of the connotation attached to certain terms here used in discussing natural disasters, a glossary is set forth at the conclusion of the report. It is unfortunate but true that in some cases these terms have a popular connotation differing from that attached to them by agencies using them in the course of performance of their duties.

#### FLOODS

Floods are a normal, not an abnormal, part of the laws of nature. Man's brief lifespan compared with nature's eons tends to cause man to overlook this fact. Floods occur throughout the United States. Accuracy of their predictability increases in terms of spans of hundreds of years; but means of predicting flood frequency improve with knowledge and research facilities. Present learning defies prediction of occurrence or magnitude of a flood in any given year at any given place.

Past records of flood heights in the United States are frequently exceeded. They therefore form only guides, rather than mathematical formulas, in flood prediction. Hydrometeorology uses records to study possibilities of precipitation and flooding.

Warning service improves with study facilities. For floods, this is a function of the United States Weather Bureau. Increased warning efficiency enables decreased flood damage. Time is often of the essence for evacuation of persons, removal of property, and emergency flood-protection measures. In recent years, warning services costing \$900,000 a year on the average have resulted in estimated savings of \$27 million a year. Work in this field is progressing, stimulated by recent hurricane damage.

One step remains between predicting flood frequency and height and predicting resulting damage. Flood damage is caused both by rising water levels and by the dynamic force of water. When both combine in superfloods, the damage may become catastrophic. Man contributes to flood damage by denuding the tree cover, erecting structures that impede, without controlling, the runoff of floodwater, and encroaching on the flood plain with homes, stores, and factories.

Flood-damage statistics are useful in indicating magnitude, but do not give indisputably exact amounts. They come from many sources, include different items, and are collected in various ways. Moreover, damage estimates from any given source for a particular year vary widely from the annual average over a span of years. The study sets forth flood-damage statistics gathered by the Weather Bureau, the Corps of Engineers, the Department of Agriculture, and the Federal Civil Defense Administration.

Weather Bureau estimates between 1924 and 1955 (preliminary) show a low of \$2.8 million in 1931 and a high of slightly over \$1 billion in 1951 and 1955. From a \$150 million annual average between 1926 and 1950, the amount has increased to \$500 million over the past 5 years.

Corps of Engineers detailed data are given for three representative river basins—the Ohio, Columbia, and Missouri. About 1950 the corps estimated average flood damage at about \$500 million. Its tentative estimate of damage done by Hurricane Diane in the New England States of Connecticut, Massachusetts, and Rhode Island on August 18 and 19, 1955, was \$1,470 million.

A Department of Agriculture representative estimates the average annual upstream floodwater damage at about \$545 million. This area encompasses only the tributary headwaters of major rivers, not the downstream rivers themselves. Coupling this with an annual average flood damage in the major river valleys of about \$500 million, and \$66 million of indirect damage annually, the Department representative reaches a total annual average floodwater and sediment damage of about \$1.2 billion.

The Federal Civil Defense Administrator, as coordinator of Federal disaster relief, gave a preliminary estimate of \$352.6 million damage from Diane in Connecticut, Massachusetts, and Rhode Island, and \$464.5 million in these States plus New Jersey, New York, and Pennsylvania.

Efforts at weather control are proceeding with promising results in some fields, such as hail prevention. But this success has not yet been transferred to control of the terrific forces involved in severe storms and hurricanes. Progress of the Advisory Committee on Weather Control in the Federal Government on weather control and legal liability for weather manipulation bear watching.

#### TIDAL WAVES

To date, true tidal waves have occurred mainly in the Pacific and Caribbean portions of United States jurisdiction. These are ocean waves caused by undersea earthquake. The Atlantic coast of the United States is occasionally afflicted by high tidal levels caused by wind. True tidal waves have reached 80 feet in height and travel at the tremendous speed of 580 knots (nautical miles per hour). While still waters may run deep, tidal waves travel fastest in deep water. Their wave length of 100 to 300 miles or more on the open sea lets them pass unnoticed there. But in shallow water, speed declines and height increases. Initial rise in the ocean level is so slight as to escape observation, but the following sizable drop in level is observed and intriguingly dangerous, as it is followed by a sizable engulfing rise in level which traps unwary onlookers. The rise is potentially destruc-

tive whether it takes the form of a gentle swell or dynamic bore. Tidal waves have been recorded since 479 B. C. in Greece. Those affecting areas now under United States jurisdiction are recorded back to 1788, when a tidal wave hit Alaska. According to Coast and Geodetic Survey records, the largest recorded seismic waves on the United States west coast occurred on April 1, 1946, and November 4, 1952. The 1946 maximum recorded height was 8.5 feet at Avila, Calif., in San Luis Obispo Bay, and the maximum recorded height in 1952 on the United States coast was 9.5 feet at the same point. Higher waves than those recorded are frequently reported from areas having no gaging station.

A storm water level of as much as 15.6 feet above mean high water level was recorded at Providence, R. I., on September 21, 1938.

A comprehensive warning system has been developed in the Pacific centered around the Honolulu Magnetic Observatory of the Coast and Geodetic Survey.

Most severe tidal wave damage to an area under United States jurisdiction occurred in 1946 when 173 lives were lost and \$25 million of property damage was inflicted in the Hawaiian Islands. Potential damage is enormously greater as proved by records. Thirty thousand persons have lost their lives in a single tidal wave in Japan.

#### HURRICANES AND OTHER STORMS

Windspeed over 75 miles per hour is the feature distinguishing hurricanes from other tropical storms. Both cause heavy damage to the United States east coast and Gulf coast. Their precise course is unpredictable, but improved tracking methods are being developed. Aircraft reconnaissance ceases over land—an observation gap that deserves attention. Means of disseminating warnings need further development, especially during the wee hours. Improved warning service has resulted in lower death rates from tropical storms, but dollar value of property damage has increased. The last 2 years have seen the greatest property damage—over \$755 million in 1954 and more than \$1 billion to September 28 in 1955.

Tornados, of short duration but extreme violence, have occurred in every State and the District of Columbia. Hundreds hit the Great Plains annually. As many lives are often lost as from hurricanes. 8,899 deaths occurred from 1916 through July 1955. Property damage runs into millions of dollars each year, varying from \$2.2 million in 1916 to \$224.3 million in 1953, according to Weather Bureau estimates. Warning service is provided, but unpredictability of paths of tornadoes makes pinpoint forecasts difficult.

Winter storms, including blizzards, glazestorms, excessive snowfall, snowslides, and severe freezes, cause widespread damage in the United States along with duststorms. The Weather Bureau operates warning services for severe freezes, severe cold waves, heavy snowstorms, and blizzards.

Thunderstorms and hail, while localized and not formidable singly, cause sizable cumulative damage to the Nation. Thunderstorms are common in the Southeast and rare on the Pacific coast. Hailstorms are most frequent in the Midwest and Great Plains.

## EARTHQUAKES AND VOLCANOES

Due to rupturing of rock masses many miles below the earth's surface, earthquakes in the United States have caused vertical fault slips up to 49 feet and horizontal fault slips of as much as 21 feet. While activity in recent years has centered near the Pacific coast, the strongest United States quake occurred in New Madrid, Mo., in 1811 and was felt over two-thirds of the Nation. To the scientist, earthquakes are routine. The Coast and Geodetic Survey notes over 1 million occur annually in the world, of which about 700 are strong. Most begin undersea and cause little damage unless a tidal wave results. Shallow earthquakes (10 to 20 miles underground) as in the Western United States, have great violence. Aftershocks are normal but hard on morale and damaging. Major United States earthquake belts are along the San Andreas Fault in California, the St. Lawrence River Valley, and the confluence of the Mississippi and Missouri Rivers. In general, not a single State is free of earthquakes. Pin-point prediction of earthquakes as to time or place is not presently practical. Some areas are obviously susceptible, such as the San Andreas Fault, where future quakes will almost certainly occur.

The Coast and Geodetic Survey, in cooperation with religious and educational institutions, investigates seismology. Its services are useful in engineering design.

As it moves to the surface, the vibrational force of an earthquake magnifies 5 to 20 times; more in light soil, less in rock.

Progress through the earth of caterpillar-like and violin-string vibrational waves enables location of earthquake epicenters at distant points. Distributed to the public, this information helps minimize aftershock damage. Intensity (violence caused on the earth's surface) must be distinguished from magnitude (amount of energy released at the underground quake center).

Although less than flood damage in toto in the United States, earthquake damage is serious. The 1906 San Francisco quake resulted in \$90 million direct damage and \$1.5 billion indirect damage from fire, in terms of 1950 dollars. By comparison, the 1952 Kern County, Calif. quake caused \$60 million damage. As in flood-damage statistics, the earthquake loss in any particular year departs substantially from the average loss over a span of years. Recorded earthquakes have caused a loss of about 1,000 lives in the United States. Of these, 700 were lost in the 1906 San Francisco quake alone.

Volcanic destruction is mainly caused by the burning effect of lava (molten rock), the engulfing effect of mud and dry ash, and the crushing effect of ash or cinders. The speed of lava flow varies with its consistency, the conditions of cooling and the slope of the bed over which it flows. During the 1855 eruption of Mauna Loa on Hawaii, the speed of flow was 40 miles per hour. The rate of flow decreases as the stream advances. At times a smog-like cloud of suffocating gases accompanies an eruption as in the 1902 Martinique case.

On continental United States, no dangerous eruptions have occurred this century. Of the many eruptions on the island of Hawaii, the 1955 Kilauea flow in the Puna district caused the most damage. The Governor's Puna Volcanic Factfinding Committee estimated total net loss of \$928,609 to property up to April 2, 1955. A different group of community leaders headed by Richard Lyman, Jr., estimated total net

loss of \$2,847,003 (private and governmental) up to April 9, 1955. Unofficial estimates from the Puna Cane Planters Association place the net loss at about \$2.6 million, after recovery of \$725,000 in insurance benefits.

Alaskan and Aleutian volcanic eruptions are frequent and potentially destructive, but they occur mostly in undeveloped areas. Most property damage, measured in thousands of dollars, was caused by the Mount Spurr eruption in 1953. One serviceman was killed in a 1944 ash shower from Cleveland volcano.

No accurate prediction can be made of volcanic eruption, according to the Geological Survey.

#### TECHNOLOGICAL DISASTERS

##### *Air pollution*

*Smog.*—Its chemical composition varies with the nature of the pollutant, usually the product of combustion or decomposition. Air has a remarkably uniform mixture of its permanent elements, mostly nitrogen and oxygen. This committee studied smog in 1954 and 1955. For the first time, United States Public Health Service has a substantial sum, \$1.8 million, available for research. Smog causes personal injury and is suspect as a cause of disease and death. Gaseous elements, potential acids, threaten damage to metallic surfaces. A severe affliction hit Donora, Pa. in the 1940's. Recently, the Los Angeles area is most notoriously affected. Research is not far enough along to present firm conclusions regarding cause, effect, or cure.

*Radioactive materials.*—The extent of the danger of radioactive contamination of the atmosphere is the subject of disagreement among learned men. Potentially the danger is serious. But on the other hand, man's body has been adapting itself to radioactive materials since long before the atomic age. To date, industrial use of nuclear fission has resulted in only one recorded accident. A crack in the Chalk River, Canada, reactor plant in 1952 emitted radioactivity, but no injury to personnel resulted. Uranium miners have been afflicted with lung cancer, suspected to have developed from radioactivity. Debate still goes on concerning the lethal effect of radioactive fallout on the boat *Fortunate Dragon* resulting from the Bikini 1954 experiments.

An insurance study group appointed by the Atomic Energy Commission has indicated in a preliminary report disclosed on July 13, 1955, that commercial insurance companies can provide coverage against the perils of radioactive contamination resulting from industrial uses of atomic energy. The amount of total coverage to be made available for this purpose is still under study.

##### *Explosions*

Servants of man in their beneficent aspects, explosions are potentially very dangerous to life and property when accidental. Witness the Texas City, Tex., disaster with its millions of dollars of damage.

Improved safety practices help control unwanted explosions. No details are presented on damage, since commercial insurance is so readily available against this peril.

## MANMADE DISASTERS

Hand-to-hand combat has evolved into a process whereby a few with powerful nuclear weapons can inflict havoc on both combatants and noncombatants. Atomic bombs in their infancy wrought tremendous damage at Hiroshima. Yet the power magnitude of such bombs was equivalent to only 20,000 tons of TNT as compared with the last publicly released H-bomb magnitude equivalent to about 16 million tons of TNT in 1954. The Hiroshima bomb leveled nearly all structures within a mile radius of ground zero. The 1954 bomb potentially could increase that area of destruction to a 9-mile radius. Of 343,000 inhabitants, the Hiroshima bomb killed 60,000, wounded 100,000 and made 200,000 homeless. Present increased destructive potential of H-bombs could have a much larger lethal effect.

A nuclear explosion causes damage by blast, heat, radiation and residual radioactivity. The degree of danger of the last factor is still unsettled. It is most dangerous when the fireball touches the earth.

The 1954 H-bomb experiments at Bikini in one instance produced a cigar-shaped contaminated fallout area up to 40 miles wide for 220 miles downwind, and about 20 miles upwind and crosswind. The AEC estimates all persons taking no protective measures in an area within 140 miles downwind and up to 20 miles in width would have had their lives seriously threatened. The danger would decrease at areas more distant.

The March 1954 fallout affected the Japanese fishermen in the *Fortunate Dragon*, as well as many natives and United States personnel on nearby islands. There is a difference of opinion whether the fallout was the direct cause of death of one of the Japanese fishermen; United States representatives believing the death was due to an intervening cause. On the basis of a report recently made for the Office of Naval Research, no lasting physical or genetic effects resulted to the natives and United States personnel dusted by the fallout.

Fallout effect is not uniform, varying with atmospherics. Precautions can reduce its evil effects. A house basement reduces radiation level to one-tenth that prevailing outdoors. Cyclone cellar protection would be adequate with a 3-foot earth cover. Immediate bathing helps decontamination, as does a change of clothes. Dangers of internal radiation also exist from fallout particles inhaled or swallowed with food or liquids. Radioactive strontium and radioactive iodine are most dangerous. With an average life of 30 years, radiostrontium tends to collect in the bones. Inhalation danger is small, but it may be incorporated in plant tissue through the soil and later taken into the body of the person eating the plant. Radioiodine, with average life of 11.5 days, could damage thyroid cells by concentrating in the thyroid glands. AEC tests indicate radiostrontium in the soil or radioiodine outside test areas to date has nowhere reached the danger level. The Commission states the amount of exposure of United States residents to radiation due to all nuclear detonations by all nations up to February 1955 was about one-tenth of a roentgen, equivalent to the amount of exposure during a single chest X-ray, and about one one-hundredth of the average radiation exposure received from natural causes by a person during reproductive lifetime. AEC medical and biological advisers do not believe this small amount

of additional exposure will seriously affect the genetic constitution of humans. Study on the point is continuing. More pessimistic opinions regarding the potential danger from fallout come from those who believe the cumulative effect of exposure to radioactivity is more important than the slight additional amount to which a person may be exposed at any given time.

While knowledge of control measures has increased with the magnitude of destructive power of nuclear weapons, the United States must pray for the best and prepare for the worst. It cannot assume that any enemy will exercise the control it is scientifically capable of using. Any Federal program of war damage indemnity must keep sight of the potential maximum war damage. Other war damage problems were comprehensively set out in this committee's 1951 hearings on war damage insurance proposals.

#### NATURAL DISASTER RELIEF

Public Law 875, 81st Congress, approved September 30, 1950, is the basic Federal disaster relief statute. Briefly it authorizes the President to determine when certain catastrophes may be classified as major disasters. As a preliminary the governor of the State involved must request that the law be invoked and give assurance of the use of a reasonable amount of funds by the State or local governments for relief. In a major disaster, all Federal agencies are authorized to provide assistance when directed by the President. In addition, some have powers granted them by other statutes for use in the event of emergencies.

On January 16, 1953, the President delegated administration of Public Law 875 to the Federal Civil Defense Administrator by Executive Order 10427. Under the philosophy of the Executive order, Federal disaster relief is supplementary to relief from other sources. The FCDA Administrator, by June 1955, arranged to have over 40 States authorize their civil-defense agencies to take part in disaster relief. The FCDA has also developed a predisaster plan with several Federal agencies by use of memorandums of understanding. These have been completed with 10 agencies. Following Hurricane Diane, disaster order No. 1 was issued on August 20, 1955. This order listed assignments to the various Federal agencies for Federal disaster relief activities. The FCDA also entered a formal understanding with the American National Red Cross on mutual relief responsibilities.

Of \$59.3 million appropriated for Public Law 875, as of June 30, 1955, there remained available for allocation about \$10.6 million. Public Law 875 has been invoked 51 times up to June 30, 1954. The detailed duties assigned to the respective Federal agencies under Public Law 875 and other laws are set forth in detail in the text of this study, as well as instances of aid given by these agencies following Hurricane Diane.

A major role in private disaster relief has been performed by the American National Red Cross since it was chartered by Congress on July 5, 1905. Its nationwide organization operates at the national level, in four area headquarters and on the county level. It provides relief on both emergency and rehabilitation bases.

Emergency relief includes mass care without investigation; medical and nursing aid; warning, rescue and evacuation services; and registration and information services.

Rehabilitation relief applies to food, clothing and maintenance; building and repair; household furnishings; medical and nursing services; and occupational supplies and equipment.

It should be noted that among the major policies covering Red Cross relief, need, rather than loss, is the basis for assistance to disaster victims, and the relief is given in the form of outright gifts, not loans. Moreover no direct assistance is given to commercial or industrial concerns. So far as feasible, relief expenditures are kept in normal trade channels.

In the Eastern States floods, as of October 15, 1955, the Red Cross had made commitments amounting to \$1,782,281 for emergency relief and \$9,432,024 for rehabilitation relief, a total of \$11,214,305.

Other private organizations provide disaster relief as well as the Red Cross. These include such groups as the Salvation Army, religious welfare groups, service clubs and national veterans' organizations. Specific cooperation was also given in Hurricane Diane by the voluntary home mortgage credit program. The American Bankers Association and individual lenders assisted SBA in processing disaster loan applications.

State disaster relief is far from uniform. Some States are well equipped; others are confronted with constitutional barriers against providing any aid other than aid in kind. The FCDA encourages States to provide an adequate relief organization. The Commission on Intergovernmental Relations raises the question whether State and local governments are contributing enough to disaster relief.

#### DISASTER INSURANCE AVAILABLE

*Basic concepts of insurance and reinsurance.*—Insurance contains these elements: (1) A pecuniary interest, (2) subject to a peril threatening loss to the risk-bearer, (3) assumption of risk by another, (4) as part of a general scheme to share losses among a large group with like risks, and (5) a ratable premium payment to a general insurance fund. (See Vance on Insurance).

Insurance gives incentive to control risks, as the insurer profits and the insured benefits from lower premium rates.

Beginning with marine risks in Italy, insurance developed in Spain, Belgium, and England. Fire and life risks were covered too. Commercial insurance of every class has continued to expand as witness group life insurance and mortgagor death benefit insurance in the United States. Lloyd's of London continues to write coverage in unusual cases on a selective basis.

Reinsurance—laying off with another all or part of the risk assumed by the insurer. Insured's claim is against insurer, not reinsurer. Terminology: Ceding company—insurer that lays off part or all of risk; reinsurer—accepting company; cession—reinsurance transaction. Evidence of reinsurance is found about the mid-18th century. 1746 Act of Parliament outlawing "reassurance" was in effect until 1846; reinsurance developed slowly; pace quickened during recent decades.

Two branches of reinsurance are facultative (optional) and treaty (automatic or obligatory). The facultative form came first, but being on a case-by-case method, was cumbersome. Under treaty form, the ceding company binds itself to cede a fixed share of each risk insured, and the reinsurer (usually many on a single policy) binds

itself to accept a specified portion of that share. The ceding company is assured of a reinsurance market; the reinsurer is assured of a share of all insurance written by the insurer.

The three kinds of treaty are (1) quota share or open, (2) surplus, and (3) excess loss.

Under a quota-share treaty, the ceding company agrees to cede a fixed share of each risk it accepts. Under the surplus treaty, the ceding company fixes the retention it keeps, the rest of the insured amount forming the surplus, which is reinsured pursuant to the treaty. Under the excess of loss treaty, no part of an individual risk is reinsured. Rather, the ceding company lays off by reinsurance the excess of any single loss over an agreed figure.

Conditions of reinsurance usually coincide with those of the insurance. The reinsurer gets the same premium rate and pays its proportionate share of each approved claim. But under an excess of loss treaty, the reinsurer gets only a percentage of all premium received by the ceding company from the class of business reinsured. The reinsurer's share of premium is subject to a commission deduction of 20 to 45 percent; and the reinsurer usually pays a 10-percent commission on average treaty profits at year's end on the preceding 3 years' profits. The reinsurer has the right to share in salvage.

The ceding company controls settlement of insurance claims. Treaty party disputes are usually settled by arbitration.

**Bordereaux**—statement in which the ceding company gives risk details.

**Retrocession**—reinsurance to the second degree. Enables laying off part of the reinsurance risk if one reinsurer receives parts of the same risk under different treaties.

**Pool or syndicate**—many companies agreeing to share all insurance in a given territory on preagreed portions of premiums and losses.

*Types of disaster insurance available.*—Some type of commercial insurance generally covers property damage from natural disasters except flood, tidal wave, certain water damage from hurricanes, and air pollution. Accident, health, and life insurance is generally available from private or public sources against personal injury or death due to natural disasters. During 8 years (1947–54), of 750,000 accidental deaths in the United States, only 1,411 resulted from natural disaster, or less than one-fifth of 1 percent, on Metropolitan Life Insurance Co. calculations. At the end of 1954, life insurance in the United States totaled \$334 billion in 237 million policies covering 93 million holders. Of this, \$118 billion worth provided for double indemnity for accidental death. At that time, over 100 million persons had some form of health insurance, which paid \$2.7 billion in benefits in all. None of these life or health policies exclude natural disaster risk; and most do not exclude war risk. Accident policies tend to exclude war risk.

Insurance on flood risk to property is very limited in availability. The only real property generally so covered are bridges and tunnels under all-risk policies, and these are chosen selectively. Comprehensive coverage is available for motor vehicles. Inland marine policies cover merchandise in transit or on consignment. Cargo and equipment may be covered under other policies. Floater policies handle contractors' equipment, jewelry, furs, and certain other personal property.

When a flood causes a fire, fire-insurance policies cover the loss. Flood insurance is not generally commercially available on real property. Even hurricane damage is legally uninsured if caused primarily by water, under most extended coverage policies.

The study gives details on standard extended coverage provisions as they apply to flood damage.

The May 1952 Report on Floods and Flood Damage issued by the Insurance Executives Association concluded flood insurance on real property was not commercially feasible.

A 1951-52 survey of their policyholders by 4 of the 6 company members of the Associated Factory Mutual Fire Insurance Cos. indicated a majority not favoring flood insurance. Less than 10 percent favored it, and then only at low rates. The president of Manufacturers Mutual Fire Insurance Co. of Providence notes the policyholders apparently preferred to deduct their uninsured losses from taxable income for Federal income-tax purposes. He notes the danger of adverse selection in flood insurance—that is, only those deeming themselves subject to flood damage would be likely to buy the insurance.

But he offers a plan for a Federal catastrophe reinsurance fund to serve as a ready source of borrowing by insurers suffering catastrophic losses in any single disaster.

In September 1955 the American Insurance Association resumed study of the commercial feasibility of flood insurance, under chairmanship of Mr. J. V. Herd.

#### GENERAL PROBLEMS

Problems for study in this field include:

1. How broadly should flood be defined?
2. Should high-risk areas be excluded or carry higher premium rates?
3. (a) How overcome adverse selection?  
(b) Will most mortgagees require flood insurance be carried?  
(c) Should coverage be required on federally aided mortgages?  
(d) How overcome past private company flood insurance difficulties?
4. (a) Are hydrological data sufficient to forecast flood frequency and intensity?  
(b) Is a detailed survey of each river and its reaches required?
5. (a) Is a detailed survey and appraisal of each property needed; or (b) can broad classifications of exposure to risk be made?
6. Is the program plagued by either too high premiums or a subsidy?
7. (a) Would States allow private companies to issue a blanket natural disaster policy?  
(b) Would prospects buy it unless the premium rate is nonactuarial and low?
8. Would offering flood insurance as an added item to extended coverage in private company policies place the insurer at a competitive disadvantage?
9. Would risk be spread better by selling flood insurance to a community for its inhabitants?
10. (a) Can catastrophic losses be controlled to prevent bankrupting a private insurer?

- (b) Would Government reinsurance solve this problem?
- (c) What if the insurer bears only a percentage of the middle risk in an approved claim?
- (d) What if Government provided a catastrophe excess loss reinsurance fund on a portfolio basis for an insurer?
- 11. (a) To reduce premiums, could a V-loan type program be offered to complement flood insurance; guaranteeing the victim borrowing power when he needs it?
- (b) Would this help lower economic groups?
- 12. (a) How prevent a premature impact of flood loss before private company reserves can be built up?
- (b) Would a Government reinsurance fund do so?
- 13. Can private companies adequately insure against radioactive air pollution damage?
- 14. Are adequate private programs offered to insure against other natural hazards?
- 15. If not, is a Government indemnity program feasible?
- 16. (a) How make it usable for intended beneficiaries without unreasonable subsidies?
- (b) Should fees be actuarial or only on ability of beneficiaries to pay?
- (c) Should they be uniform or graded by risk?
- 17. Would nonparticipants have persuasive basis for relief claims against Government?

#### LOSS EXPERIENCE

Of the 1951 Kansas-Missouri \$1 billion flood loss, only 5 percent was covered by insurance, according to a Kansas City official.

Figure 26 contains information about stock company experience under the extended coverage clause for 5- and 10-year periods ending in 1954. Eastern United States shows an unprofitable ratio of losses incurred to premiums earned—132.1 over a 5-year term and 105 over a 10-year term. An increase in premium rates has followed.

The 1954 annual report of the Factory Mutual Engineering Division shows a 10-year net loss equaling 3.53 percent of net insurance in force. For 1954 alone, the percentage was 3.62. Table 45 in the study shows types of losses. Fire and windstorm are the greatest perils.

In 1954 Manufacturers Mutual Fire Insurance Co. loss ratio was 4.11 cents per \$100 of insurance in force. Table 47 in the study summarizes the losses. Fire and wind perils again predominate.

The Coast and Geodetic Survey estimates about \$1 billion of earthquake insurance is in force in California.

War damage insurance is offered privately for Mackinac Straits Bridge foundations and superstructure.

Private insurers also offer some policies not purchased by potential buyers; witness third party liability additional coverage in motor vehicle policies.

BACKGROUND CONSIDERATIONS FOR FEDERAL PARTICIPATION IN  
DISASTER INSURANCE

Natural disasters cross State boundaries and are widespread throughout the Nation. They raise problems Congress can settle under its constitutional grant of powers.

In the 1936 Flood Control Act, Congress declared that floods menace national welfare, and called flood control a proper Federal activity. Flood insurance is a related step in minimizing flood menace to national welfare.

The Federal Government has operated at least 15 insurance or similar programs; many began when private business doubted their workability. A recent example is Federal crop insurance. Administered by the Federal Crop Insurance Corporation in the Department of Agriculture, its growing pains serve as guides for disaster insurance.

Another guide is War Damage Corporation, particularly on administrative problems. Chartered by RFC on December 13, 1941, WDC's authority to insure or reinsure against war damage to real and personal property was confirmed by statute on March 27, 1942. WDC is presently in liquidation. Originally coverage was automatic and free. Later its premium structure involved uniform rates by type of property. WDC had power to make general exceptions from coverage and limit protection in areas where the United States loses control. From total premiums of about \$250 million, operating expenses of around \$39 million were paid, leaving net profit of some \$210 million. Of this, participating private companies received around \$21 million. A total of \$1.2 million was paid in claims.

HISTORY OF LEGISLATIVE PROPOSALS RELATING TO FEDERAL DISASTER  
INSURANCE

On August 20, 1951, President Truman sent to Congress a special message requesting a \$50 million revolving fund to finance a Federal insurance program, as well as partial personal indemnity for flood victims, direct and guaranteed loans for homes and businesses, farmland and building aid, and loans to aid State and local government participation.

In September 1951 hearings before the House Appropriations Committee resulted in an October 3, 1951 report (H. Rept. No. 1092) to accompany House Joint Resolution 341, reviewing difficulties contemplated in a flood-insurance program and not recommending appropriation of any portion of the \$50 million requested.

Senate Appropriations Committee hearings on House Joint Resolution 341 in October 1951 resulted in Senate Report No. 961 noting that flood insurance involved substantive legislation that should be considered by other legislative committees.

A flood indemnity bill for property had been introduced by Congressman Bolling. On September 20, 1951, Senator Carlson introduced S. 2148 to establish a National Disaster Insurance Corporation offering reinsurance against certain natural disasters. Provisions were the same as those in the bill Senator Carlson proposes to introduce in January 1956 which is summarized later in this study. Referred

to this committee, the bill was sent to the appropriate executive agencies for comment. In a December 5, 1951, reply, RFC raised five objections to the bill.

By request of the Budget Bureau, RFC helped draft proposed legislation which accompanied President Truman's May 5, 1952, special message to Congress recommending national flood insurance. Senator Maybank introduced the bill by request as S. 3146. Congressman Bolling introduced it in the House as H. R. 7726. Under it, RFC could have insured or reinsured against damage to real or personal property (including farm commodities and State or local government-owned property) due to floods in the United States, its Territories, or possessions. A more detailed summary of S. 3146 appears in the text of the study. Preoccupied with the Defense Production Act amendments, the committee held no hearings on S. 3146. The House Committee on Banking and Currency held a hearing on the companion bill, H. R. 7726, on July 1, 1952, but took no further action.

No new bills on flood insurance were introduced in the Senate in the 83d or during the first session of the 84th Congress. In the House, Congressman Bolling reintroduced his bill on January 3, 1953, as H. R. 377, but no further action on it developed.

Renewed interest accompanied hurricanes and floods in August 1955. Committee staff action was initiated by Senator Fulbright immediately. Expressions of interest in the subject have been received from many Senators and Representatives.

Four proposed bills have been presented to the committee: the Lehman bill, the Kennedy-Saltsonstall bill, the Carlson bill, and a bill drafted by the staff at the request of Senator Bush. These four are summarized later in this study.

The executive branch is also studying the matter.

#### RECENT LEGISLATIVE PROPOSALS RELATING TO WAR DAMAGE INSURANCE

After WDC ceased operating, several measures have been introduced to renew its program or an expanded program of war damage insurance.

In December 1950, the House passed H. R. 9802, but after being favorably reported to the Senate by this committee, it did not pass.

The 82d Congress saw 4 bills and 1 Senate joint resolution on this subject matter introduced in the Senate: S. 439, by Senator Magnuson, to revive WDC; S. 114, by Senator Ferguson, to do this plus provide workmen's compensation liability coverage; S. 1309, by Senator Ives, to do both these things plus coverage for injury to or death of civil defense workers; S. 1848, a comprehensive disaster indemnity bill presented by the Bureau of the Budget and introduced by Senator Frear by request; and Senate Joint Resolution 171, stating a declaration of policy recognizing some Federal responsibility for war damage without providing detailed remedies.

Extensive public hearings were held on the subject by this committee's Subcommittee on Securities, Insurance, and Banking under chairmanship of Senator Frear in April and July, 1951. These were followed in 1952 by informal conferences with several interested groups.

In the 83d Congress, Senator Frear reintroduced Senate Joint Resolution 171 of the 82d Congress as Senate Joint Resolution 40. Senator Ferguson introduced S. 476 to grant succession to WDC. Referred to this committee, no further action was taken on them.

No war damage insurance bills or resolutions were introduced in the Senate during the 1st session of the 84th Congress.

The proposed Lehman bill and the bill drafted at Senator Bush's request would authorize war damage indemnity.

#### ARGUMENTS FOR FEDERAL INDEMNITY PLAN

*Tax loss.*—Though not precisely calculable on presently available information, tax losses accompany natural disasters. Filling this void would give the Government an equal amount of funds to operate a Federal disaster insurance or indemnity program without increasing net cost to the Federal Government. In individual Federal income tax returns for 1952, taxpayers deducted \$367.5 million as unreimbursed losses due to flood, among other disasters. Of this, \$295.6 million was in taxable returns. Assuming the flood loss component to be high because relatively uninsurable, a substantial tax loss to the Federal Government would result, depending on the tax bracket of the victim. Additional loss would be sustained from returns by corporate flood victims and from excise tax losses due to interruption of production.

Similar tax losses may be suffered by States and local governments, as well as sales tax losses and property tax losses.

Interruption of taxable income due to flood causes further tax loss.

In general the main arguments for a Federal indemnity plan would include the following:

1. Keeps disaster victim's credit sound.
2. Quickens his economic recovery.
3. Tax income recuperates faster.
4. Sales tax receipts increase quicker.
5. Reimbursed losses can't be deducted for Federal income tax purposes.
6. Would complement and save costly expense of superflood protection.
7. Would offset present demands for Government relief and would be supported by advance contributions.
8. Variable premium rates discourage use of floodable land.
9. Would help morale of potential victims.
10. Government need not seek a profit on the program.
11. Government can meet catastrophic impact demands.
12. Federal reinsurance could limit net exposure of private insurer, enabling low actuarial rates for that portion of coverage. Adding a low nonactuarial rate for Government exposure could result in a low overall premium rate.
13. Government can do what private industry or people can't or won't do—provide a workable flood indemnity program.
14. Objections to some features of certain plans can be met without discarding the whole plan.
15. Statutory limits can control Government exposure to risk.

#### ARGUMENTS AGAINST FEDERAL INDEMNITY PLAN

Arguments against a Federal indemnity plan include:

1. Actuarial premiums are discouragingly high.
2. Without them, Federal subsidies are involved.
3. Those not participating will still demand Federal flood relief.

4. Some proposals conflict with insurance now available.
5. Charging for a peril not present violates insurance principles.
6. Insurance is a deceptive description of an indemnity program; its failure may impair confidence in true insurance operations; its success may lead to unjust comparison with private company rates.
7. Private insurers may hesitate to issue disaster policies even with Federal reinsurance.
8. Flood losses are catastrophic and frequent; hence insuring them is feared unprofitable.
9. Mortgagees will self-insure against flood risk by selectivity.
10. Insisting on mortgagor's carrying flood insurance would place a mortgagee at a competitive disadvantage.
11. So would adding flood risk to extended coverage.
12. Excluding high-risk areas denies benefits where needed; including them induces a high premium or an unfairly distributed premium.
13. Contractual Federal insurance policies may impede sound Federal fiscal management.
14. Providing relief on the basis of actual disaster facts is more practical.
15. The brother's keeper method of [handling disaster relief has worked well.
16. Flood-protective works should be emphasized.
17. A short program will not give a true measure of failure or success.
18. Issuing high-risk policies to many compounds, rather than spreads, the risk.
19. Voluntary insurance would be plagued by adverse selection.
20. Uniform charges would unwisely encourage use of floodable land.
21. Those building in known flood-risk areas have probably paid little for the land.
22. Statutory limits on Government exposure can be easily pierced on demand.
23. Such limits on eligible beneficiaries won't hold against demands from others wanting to be beneficiaries.
24. Experience shows tendency to drop flood coverage in nonflood years.
25. The same trend develops when premium rates increase.
26. While a small program can't spread the risk, a large program would be costly upon failure.

#### SPECIFIC TOPICS FOR DEVELOPMENT

If a Federal program is desired, the following specific topics for development should be noted:

1. Policy conditions?
2. Insurance or reinsurance?
3. Use private insurers as issuers?
4. Use private insurers to recommend claim adjustments?
5. Government administering agency?
6. Advisory committee makeup?

7. Total liability?
8. Government reimbursement of loss on private policies?
9. Types of policies?
10. Items insured?
11. Require Government-aided mortgagors to carry disaster insurance?
12. Reinsure excess loss on portfolio basis?
13. Group insurance for community residents?
14. Line of credit to potential victims on payment of commitment fee?

#### PROPOSED LEGISLATION

This study sets forth a summary of the four proposed bills on this subject presented to the committee, a sectional analysis of each, and each proposed bill in full.

In general terms, the four bills may be summarized as follows:

1. *The Lehman bill.*—By far the most comprehensive in scope and detail of the four, this bill authorizes insurance and reinsurance for several types of natural and man-made disaster and would strengthen the statutory authority of the Federal Civil Defense Administration to handle disaster-relief insurance and reinsurance. In recognition of the broader scope to be covered by the Federal Civil Defense Administration, the bill changes its title to Federal Disaster Administration.

#### *Title I—Natural Disaster*

Insurance and reinsurance could apply to damage from flood, tidal wave, hurricane, tornado, blizzard, duststorm, hailstorm or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination or other air pollution, or volcanic eruption.

Coverage is authorized for both real and personal property, either privately owned or owned by State or local governments. It is limited to property located in the United States, its Territories, or possessions. Variable premium rate schedules are to be based upon consideration of the risks involved and shall be as nearly adequate as practicable to make the program self-supporting, consistent with the aim of achieving rate schedules reasonable enough to encourage insurance purchase. Risks impractical to cover may be excluded. No property used inconsistently with flood zoning laws shall be covered. A \$300,000 limit per person or government is set on Federal insurance against natural disaster. Each policy must contain a \$200 loss deductible provision. Terms and conditions of reinsured policies must meet the Federal Disaster Administrator's approval. Insurance may be offered on a community basis. Reinsurance plans may include a Federal catastrophe excess loss reinsurance fund to cover an insurer's excess losses on a portfolio basis in any single catastrophe.

The total outstanding liability of the Administrator under natural disaster insurance or reinsurance shall not exceed \$2 billion. Appropriate funds for operations and reserves are authorized, to be fed by

premiums, investment income, salvage, and Treasury borrowings up to \$1 billion by the Administrator (or such larger amount as the President may approve). Claims paid shall not exceed the lower of actual value or replacement cost minus depreciation. Court review is authorized for unsatisfactory claims adjustment. No insurance or reinsurance can cover perils for which insurance is reasonably available from public or private sources, except that a blanket natural disaster policy may be offered under the bill. Facilities of private organizations are to be used to the maximum extent practicable. They may contract to share underwriting risks, sharing profits or losses.

Federally aided property may be required to carry natural disaster insurance.

### *Title II—Manmade disaster*

Insurance or reinsurance is authorized for war damage (as defined) to real and personal property and persons. Coverage may include damage to realty or personalty, workmen's compensation liability, injury or death of civil-defense workers and those performing like duties with official sanction, and injury, disease, or death of persons generally. General exceptions as to classes of persons or property are authorized. Civil-defense workers and those in similar status receive indemnity without paying premiums. Other coverage requires premiums based on the average risk for each class. Rates are uniform for (1) each type of property, (2) workmen's compensation liability, and (3) legal residence for personal insurance. Coverage applies only to property in or touching United States territory or in transit from one point to another therein and to persons in United States territory. Indemnity offered varies with property value, its importance to national security, and State workmen's compensation or occupational disease laws. It is limited to 75 percent of the declared value of property. It may be paid in stages of 10 percent within 2 months after claim approval and the balance within 14 months after such approval, if advisable in the interest of Federal credit or stability. No other limits are placed on coverage under an individual policy but aggregate exposure to liability for property insured can't exceed \$10 billion. Federally aided property may be required to carry war-damage insurance. No overall limit applies to personal injury, disease, or death; this is governed by State law limits per person. Appropriate funds for operations and reserves are authorized, fed by premiums, investment proceeds, salvage, and Treasury borrowings up to \$10 billion (or more with Presidential approval). No indemnity, insurance, or reinsurance applies to risks eligible for other Federal insurance or to the extent coverage is reasonably available from other public or private sources. The facilities of private organizations are to be used to the maximum extent practicable. Court review is authorized for unsatisfactory claim adjustment.

### *Title III—General provisions*

A 3- to 15-man advisory committee is required, composed of persons familiar with indemnity, insurance or reinsurance problems. House-keeping provisions are included. Statutory authority is given the Federal Civil Defense Administration (renamed the Federal Disaster Administration) to handle natural disaster relief. State responsibility

for disaster relief is broadened by requiring (1) maintenance of a \$100,000 disaster relief fund in each State or a State agreement to set off up to \$100,000 disaster relief against other Federal moneys coming due to the State and (2) State assurance of maximum use of State and local personnel and facilities with agreement to shift their control during an emergency to Federal authorities upon request. The Administrator is authorized to federalize public relief personnel (except as to employment status), much as the National Guard can be called into Federal service. Annual reports to the Congress are required.

2. *The Kennedy-Saltonstall bill.*—Except for the fact that it authorizes insurance as well as reinsurance, this bill is the most limited in scope of the four contained herein. It is offered as a small experimental program to test the feasibility of Federal flood insurance and reinsurance for homeowners and businessmen. The Small Business Administration would be authorized to insure or reinsure privately owned real property (commercial, industrial, and residential) against flood loss in the United States, its territories and possessions. Personal property would not be covered. General exclusions are authorized, as well as limits of coverage by areas. Premium rates would be uniform by type of insurance or reinsurance and type or class of property covered. Rates are to be based on consideration of risks and to the extent practicable shall be adequate to cover operations and reserves. A limit of \$250,000 is set for a policy on any single piece of realty. Subsidiary and affiliated corporations are subject to regulation as to obtaining insurance. No claim paid shall exceed the lower of actual cash value or replacement cost minus depreciation. Each policy shall contain a loss-deductible provision of \$300 plus 10 percent of the remainder of the claim, as a minimum. SBA may regulate reinsurance terms. Total exposure to risk is limited to one-half billion dollars (plus one-half billion dollars additional on each July 1 in 1957 and 1958 with Presidential approval). A national flood insurance fund is authorized in the Treasury to cover operations and reserves to be fed by premiums, salvage, and other receipts, and appropriations authorized by the bill without fiscal-year limitations. Actual advances from appropriations shall be made upon SBA request, and interest on advances shall be charged at the average rate on United States obligations. Excess capital may be repaid to appropriations. Private insurance companies may contract to share underwriting risks and participate in profits or losses. The program shall be handled so as not to induce unwarranted acquisition of facilities in recurrently flooded areas. SBA shall consult with Federal, State, and local flood-control agencies to make insurance program consistent with their programs. SBA shall not offer insurance or reinsurance for property used in conflict with flood zoning laws. Federally aided property may be required to carry flood insurance. An advisory committee of six or more persons experienced in writing property insurance is required. No insurance or reinsurance is to be issued for risks eligible for other Federal insurance or to the extent coverage is reasonably available from public or private sources. Facilities and services of private insurance companies shall be used to the fullest extent possible, consistent with minimum-cost insurance.

3. *The Carlson bill.*—This bill authorizes only reinsurance on real or personal property owned privately or by State or local governments.

Coverage includes damage by flood, tidal wave, earthquake, or hurricane in the United States or its Territories. The bill creates a National Disaster Insurance Corporation with a bipartisan three-man Board of Directors appointed by the President subject to Senate confirmation. The President designates one director as Chairman. Capital stock of \$50 million is authorized, a like amount being authorized to be appropriated to the Secretary of the Treasury to subscribe to such stock. Usual powers of a Government corporation are granted to NDIC. It is made subject to the Government Corporation Control Act. Reinsurance premium rates are to be based upon consideration of risks and the desirability in the public interest of providing insurance otherwise unavailable. From private insurance organizations the Corporation may obtain loss-experience information necessary to establish premium rates on a sound actuarial basis and on the lowest practicable level. The Corporation regulates types of property covered, nature and limits of reinsured losses, and other matters necessary. No statutory limit is provided for policies reinsured or for total exposure to risk. Court review is authorized for unsatisfactory claim adjustments. A national disaster insurance fund is created as a permanent trust fund in the Treasury, fed by premiums and interest earnings. Portions of the fund may be set aside as reserves. Administrative expenses are to be paid from appropriations authorized, not from the fund. An annual report to the Congress is required. Reinsurance is to be offered only to the extent not otherwise reasonably available from private sources. Facilities and services of private insurance companies shall be used to the maximum extent practicable.

4. *The staff bill drafted by request of Senator Bush.*—This bill is as broad in perils covered as the Lehman bill, but is not as detailed. It covers flood, tidal wave, hurricane, tornado, blizzard, duststorm, hailstorm, or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination or other air pollution, and volcanic eruption; as well as war damage, upon a Presidential finding that such coverage is necessary in the public interest. The bill authorizes administration of the program by the Small Business Administrator or such other existing Government officer or agency as the President may designate. It authorizes indemnity (rather than insurance) and reinsurance against damage to real and personal property owned privately or by State or local government, occurring within the United States or its Territories or possessions. Fees and reinsurance premium rates are to be based on consideration of the risks, the desirability in the public interest of providing protection and the aim of providing from premiums, investment income, and salvage a sum sufficient to pay operating expenses and maintain reserves. Types of property covered, nature and limits of losses, and other necessary matters are left to regulation. Limits under a single agreement or policy are set at \$60,000 for a 1- to 4-family house and \$250,000 on a property in a single area. Total outstanding liability under this bill is limited to \$2 billion. The bill authorizes the Federal Government to reinsure 100 percent of each loss up to \$1,000 and over \$50,000 and as much as 80 percent of the portion of each loss from \$1,000 to \$50,000, in an effort to limit the federally uninsurable exposure of the insurer to a maximum of \$9,800 per policy, in the hope that this would enable the insurer to set a low actuarial premium rate on this limited exposure. This,

added to the rate charged by the Federal Government for reinsurance (which need not be based solely on actuarial principles), would tend to lower the insurance premium required from the policyholder below that required on true actuarial principles. Any policy reinsured under this bill would be subject to Federal approval. A loss deductible provision could thus be required. Court review is authorized for unsatisfactory claim adjustment. A disaster indemnity fund and a disaster reinsurance reserve fund are created for operations and reserves, to be fed by fees and premiums, investment income, salvage, and Treasury borrowings up to \$1 billion (or more if approved by the President). No indemnity or reinsurance is to be provided for risks eligible for other Federal insurance or to the extent coverage is reasonably available from public or private sources. Nor is protection to be offered for property used in conflict with flood or disaster zoning laws. Services of private insurance companies are to be used to the maximum extent practicable. Free indemnity up to half their unreimbursed proven property loss in major disasters during the current fiscal year is authorized for victims of major disasters. Payments may be made from the disaster indemnity fund.

War damage (as defined) coverage by insurance or reinsurance may be triggered by a Presidential finding that it is necessary in the public interest. Terms and conditions of such reasonable protection against damage to real and personal property and against personal injury or death and the amount charged for it are left to administrative discretion. Total exposure to liability outstanding is limited to \$10 billion. A war damage fund is authorized to be established by transfer of \$100 million as a non-interest-bearing loan from the disaster indemnity fund. The fund may be fed by charges, investment income, salvage, and Treasury borrowings within the natural disaster borrowing limits of \$1 billion, or higher amount approved by the President.

An advisory committee of 3 to 25 persons familiar with indemnity, insurance, or reinsurance problems is required. Annual reports to the Congress are to be made.

#### GLOSSARY OF TERMS

A glossary is included containing terms used in the chapter discussing weather phenomena.

#### LIST OF CREDITS

This list identifies those who substantially contributed to this study.



## II. FLOODS

Flooding is a natural, not an abnormal, behavior of streams. What makes the process appear abnormal is the lack of a forecastable cycle of flood patterns over a short span of years and the variation in stages or magnitude of successive flooding in a given stream. Hydraulic engineers use frequency of recurrence as a basis for flood comparison. As noted on page 57 of the authoritative book entitled "Floods" by William G. Hoyt and Walter B. Langbein:

We speak of a 10-year flood, or a 100-year flood, meaning in each case a flood of such magnitude that it occurs once in 10 years, or 100 years, on the average. This does not mean that the floods occur evenly spaced at 10- or 100-year intervals. On the contrary, 2 or more floods of 100-year magnitude can and sometimes do happen in close succession. A recent experience involves the group of four floods in 1943, 1944, 1947, and 1951 on the Mississippi at St. Louis. Floods of the height of these years had not occurred since 1844. At the other extreme, a century or more may elapse without a 100-year flood. But on the average, in a very long history, say 1,000 years, there would be ten 100-year floods.

Because of this irregularity in what may prove to be a cycle over hundreds of years, men sometimes tend to discount flood warnings and ignore the fact that flooding is a natural process. "Floods" on page 115 invites attention to an experience during the 1935 flood in Kansas as reported in Water-Supply Paper 796B of the United States Geological Survey, quoted as follows:

Dwellers on the lowlands were warned of their danger, and trucks were waiting to take them to higher ground, but they had lived there so long and seen so-called high water so many times without trouble, that all warnings and proffered help were rejected with perilous results.

According to competent hydrological engineers, that a river will overflow its adjoining flood plain on occasion is as certain as the rise and fall of the tide, but its exact timing is completely unpredictable. Man's short span of life (and sometimes shorter memory of unpleasant events) compared to nature's eons accounts for man's occasional failure to accept the process of flooding as a natural law to the same extent that he accepts the rise and fall of ocean tides.

In nontechnical terms, the beginning of a flood may be traced to the condition in which the soil does not absorb rainfall or melting snow, leaving the water to run over the surface into a stream. The level of the stream rises. The composite result of many such streams flowing into the main body of a larger river is to compound the effect of this sudden runoff. The river rises above its usual channel level and spills over on to the adjoining flood plain. The valley of the river acts as a natural reservoir. Upon the magnitude of the flood depends how much of the valley is used for this purpose. The velocity of the passage of floodwater down the stream adds peril to the normal effects of inundation. Manmade structures located in the path of the rising water suffer from the combined effects of the stage or height of the floodwaters and the speed of the flow.

## GEOGRAPHIC PATTERN

Hundreds of floods, small and great, occur annually in the United States. Under certain combinations of meteorological and hydrological conditions, superfloods of unprecedented magnitude occur. The authors of "Floods" note that there is every reason to believe that in most rivers past floods may not be an accurate measure of ultimate flood potentialities.

Only a few areas in the United States possess soil able to absorb nearly all precipitation. In the lava-covered portions of the Pacific Northwest and the sand hill areas of the Great Plains, porous soil accomplishes this result, so surface runoff is rare and streamflow is uniform. These ideal antiflood conditions also exist in most river basins the greater part of the time. Under other conditions, however, flood conditions develop at one time or another over most of the United States.

The nature of the soil, taken together with frequency and intensity of precipitation and the state of vegetation, are factors vitally influencing the development of flood conditions. Obviously these factors differ in several areas of this Nation.

For example, the Northeastern United States usually has quite uniform annual precipitation. Shallow snow (2 to 4 feet) in this area constitutes a potential source of flood runoff. Major recorded floods in the area have been associated with melting snow, producing a 10- to 15-inch runoff. Ice breakup in the rivers in warm winter spells or in spring aggravate flood conditions.

Summer and autumn floods occur due to intensive rains following wet periods that prime the ground for nonabsorption. These were the conditions that prevailed during the recent damaging Northeast floods. Precipitation from Hurricane Connie soaked the ground to an extent causing most of Hurricane Diane's rains to form a flood runoff. Seldom do summer and autumn runoffs in this area exceed 8 to 10 inches, but being sharply concentrated, peak discharges equal and in local areas may exceed those of more general winter floods of greater volume.

The Southeastern area of the United States is generally humid and has fairly uniform rainfall distribution by seasons. An exception is Southern Florida which receives most of its rain in late summer and autumn during the hurricane season. The Southeast region has more rainfall than the Northeast, experiencing some of the greatest rainstorms recorded in the United States. Coastal plain streams are somewhat sluggish and flood peaks are low and of relatively long duration.

The Great Plains from the 95th meridian near the western boundary of Missouri to the foothills of the Rocky Mountains are subhumid to semiarid grasslands. Smaller streams are mostly dry except during heavy rains, especially cloudbursts. Only the larger streams beginning in the Rockies are perennial. Snow is an important factor in flood runoff only in the Missouri Basin in the northern Great Plains. Rivers heading in the Rockies reach high stages during their course through the plains each winter and spring. Severe floods sometimes develop from intense summer rains but runoff volume usually is small compared to the humid eastern part of the United States. From a watershed with an average rainfall of 7 inches, only 1 inch of runoff resulted. In the May-June 1935 storm on the Republican and upper Kansas

Rivers, precipitation was as high as 15 inches during the 5 days of rain. The storm covered about 80,000 square miles. But in the July 1951 lower Kansas River flood, runoff rose to 10 or 12 inches after 12 to 14 inches of rainfall because the soil had already absorbed several inches of rain during preceding weeks.

At the high southern edge of the Great Plains, about 150 miles from the Gulf of Mexico, large flood-producing storms are more frequent than in any other region in the United States. Moist air from the gulf is lifted up the Balcones escarpment at the southern edge of the plains and causes heavy rain. The greatest recorded rainstorm in the United States fell September 1921 at Thrall, Tex., in the Balcones area.

In Western United States, physiography is closely related to flood potentialities. It is an area of cool, humid mountains and warm semiarid valleys. Winter rains from the Pacific go eastward at high altitudes. Summer rains from the Great Plains go west at lower levels. Accumulated snow on the mountain ranges below 10,000 feet in altitude is the main source of spring floods. Higher up, the snow thaws so slowly it seldom makes floods. The low level snow disappears with the first thaw. Therefore, annual flood potential depends on the depth of snow lying on the middle altitude levels. A delayed thaw in late spring causes the highest river stages in the valleys. In the Pacific Northwest and to a lesser degree in the lower Sierras in California, rain is apt to fall during the snowmelt period. The combination runoff may range from 15 to 30 inches in a single flood. This is about the probable maximum runoff in the United States. However, it takes place over periods as long as several weeks and therefore is usually of a low order of intensity.

Cloudburst floods are common in the West. They are most frequent in the intermountain deserts of Nevada, Arizona, Utah, and New Mexico, and usually happen in summer. Moist air hitting mountains or lifted from valleys on hot days produces these cloudbursts. But summer rainfall from cyclonic or frontal activity is negligible in this area. Occasionally wide general summer storms develop from moist tropical air moving inland from the Pacific Ocean. For example, the storm of September 25-27, 1926, covered 3,000 square miles in southern Arizona and northern Mexico.

Thunderstorms occur in scattered areas, and are most likely where a sharp break in topography occurs. Most occur between noon and midnight, with high intensity at the start of the storm and relatively gentle rain for several hours thereafter in many cases. While the resulting runoff in inches is low, the discharge rate is rapid, being concentrated within an hour or two. Resulting flash floods occur in "dry" stream channels, flowing swiftly downstream as a steep-fronted wave, often reported as a wall of water. At the mouth of mountain canyons, the result is often a debris-laden flood called a mudflow that spews out over the alluvial fan like wet mortar.

For nearly all the foregoing material under this heading, "Geographic Pattern," the committee is indebted to the book *Floods*, by Hoyt and Langbein.

Representative major floods over the past 30 years in the United States include the following in chronological order:

1. November 1927: New England
2. July 1935: Southern New York State

3. January 1, 1934: La Canada Valley, Calif.
4. August 1935: Muskingum River Basin, Ohio
5. May and June 1935: Republican and Kansas Rivers
6. 1936: Texas
7. March 1936: Northeastern United States
8. January–February 1937: Ohio and Mississippi Rivers
9. July 1937: Eastern Kentucky
10. August 1940: Southeastern States
11. July 1942: North Central Pennsylvania
12. April–May 1943: Ohio and Mississippi River Basins
13. May–June 1948: Columbia River Basin
14. July 1951: Kansas–Missouri
15. March–April 1952: Missouri River Basin
16. May–June 1954: Iowa, Cedar and Des Moines River Basins
17. October 9–10, 1954: Chicago, Ill.
18. August and October 1955: Northeastern United States

Estimates of damage caused by those floods appear later in this report. It is noticeable that at one time or another, most parts of the continental United States have been afflicted by major floods.

The Office of the Chief of Engineers, Department of the Army, has furnished detailed information concerning three river basins as being representative of floods included in the foregoing list. The three selected were the basins of the Ohio, Columbia, and Missouri Rivers.

A basin map for the Ohio River is set forth in figure 2A on which the areas inundated during the 1937 flood are indicated by overlay. Because of the scale required to provide a map of reasonable size, the figure is not considered to provide a particularly impressive picture of the seriousness of the flood.

Due to the relatively narrow valleys of the upper Ohio Basin, it is not practicable to show the areas flooded in March 1936 on a general map of reasonable size without giving the false impression that the flood was of minor consequence. This can be seen from the following tabulation of selected data on river widths at the time of the flood crest, table 1.

TABLE 1.—*River widths, upper Ohio River Basin, 1936 flood*

Reach—miles above mouth (miles below Pittsburgh for Ohio River)		Average width of river at crest of March 1936 flood-feet (including normal in-bank width)				
From	To	Ohio	Alle- gheny	Kiskiminetas- Conemaugh	Mononga- hela	Youghiogheny
0	10	4,200	2,450	1,000	1,700	1,050
10	20	2,600	2,200	1,000		1,000
20	30	2,350	2,000	1,100		
30	40	1,900	1,300	1,800		
40	50	2,400	1,550	1,450		
50	60	2,400	1,050	950		
60	70	2,250	850	2,150		
70	80	3,150		750		
80	90	3,050				
90	100	2,900				
100	110	2,250				

The profile contained in figure 2 is believed to provide an excellent general picture of the situation along the Ohio River main stem during major floods. It shows that the 1936 flood was the greatest of record in the basin area above Wheeling; that the 1913 flood was the greatest in the Wheeling-Point Pleasant area; and that the 1937 flood was the



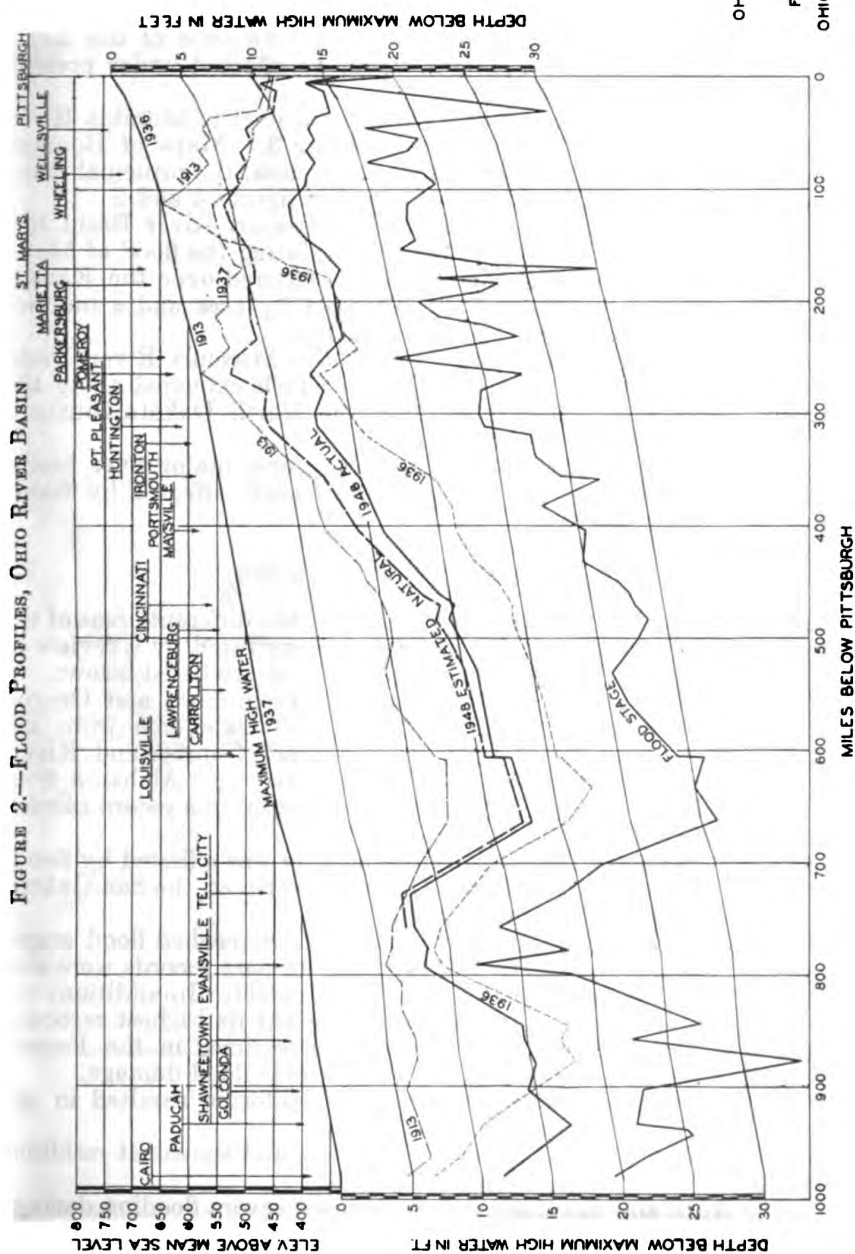
## OHIO RIVER BASIN

AREAS INUNDAED BY  
FLOOD OF JANUARY 1937

SCALE OF MILES

0 10 20 30 40 50 60 70





greatest in the 700-mile reach below Point Pleasant. The plate includes a flood-stage profile which permits determination of maximum depths of flooding at important river communities. (It should be recognized, of course, that the flood-stage profile does not reflect the high level of protection now afforded at a substantial number of the communities by local protection projects completed by the Corps of Engineers. In addition, the profiles shown for the 1948 flood reflect only the effect of reservoirs in operation at the time of the flood. Somewhat greater flood reductions would be effected under present conditions of reservoir development.)

A map showing the general areas inundated in the Columbia River Basin during the 1948 flood appears in figure 3. Maps of Bonanza Ferry, Idaho, and the lower Columbia River area, the principal damage centers during the flood, are contained in figures 4 and 5.

The map in figure 6 shows areas in the Missouri River Basin (including the Kansas River Basin) inundated during the flood of May-July 1951. It can be noted that the flood centered over the Kansas River Basin, severely afflicting the Kansas City area and a number of other urban centers along the Kansas River.

The map in figure 7 indicates areas in the Missouri River Basin directly affected by the April 1952 flood, which extended along the Missouri River some 1,300 miles from the North Dakota southern boundary to the mouth of the river.

The material submitted relative to these three major river basins depicts in impressive terms the widespread areas affected by flooding occurring in those basins.

#### RECENT UNITED STATES FLOODS

The tendency of floods to afflict widespread but different areas of the United States from time to time is also demonstrated by a review of floods occurring within the past 5 years. These are listed below:

1951.—(1) Minnesota River Basin; (2) Washington and Oregon from the Columbia River; (3) Arkansas and Oklahoma from the Arkansas River; (4) Kentucky from the upper Cumberland River; (5) Nebraska and Iowa from the Missouri River; (6) Alabama from the Warrior River system; (7) Kansas, resulting from a record rainfall affecting 1,000 square miles.

1952.—In 1952, the southern California area was afflicted by flooding in January due to the rising of the Los Angeles River, the San Gabriel River, Rio Hondo and Balboa Creek.

During March and April the Missouri River reached flood stage. Due to ice jams in the North Dakota area, all past records were surpassed by the flood volume of 10 million acre-feet. In addition, the Mississippi River above Keokuk, Iowa, reached its highest recorded level due to melting snow, and heavy rains occurred in the Passaic River Basin in New Jersey, causing considerable flood damage.

1953.—In January, storms in northern California resulted in the loss of several lives and severe damage.

In March, New England suffered heavy rain and snowmelt resulting in the loss of some lives and heavy damage.

During April and May, heavy rains caused severe flooding damage in Louisiana and eastern Texas.

Severe flooding also occurred in the upper Red River near Wahpeton and Fargo, N. Dak.



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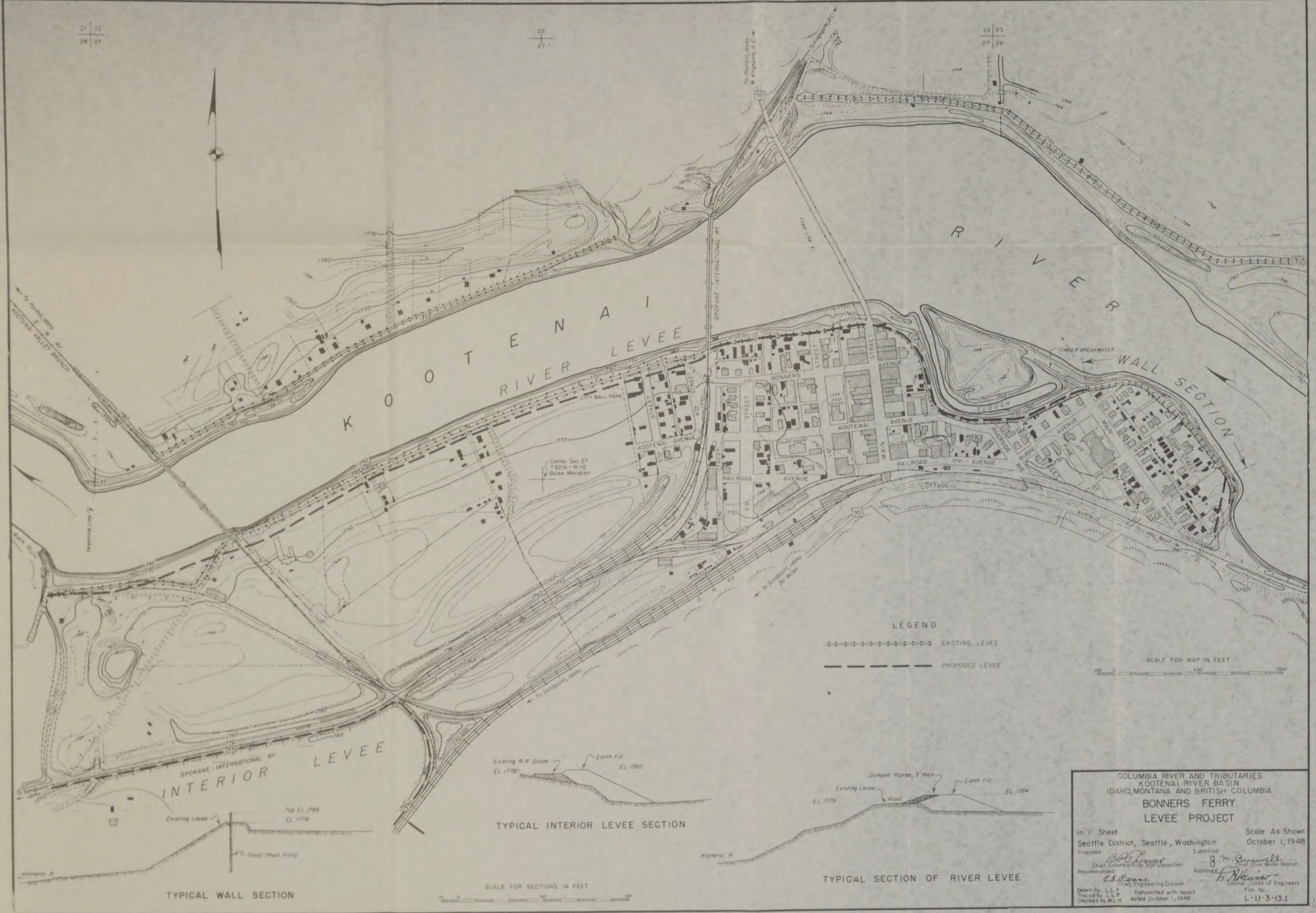
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COLUMBIA RIVER AND TRIBUTARIES  
KOOTENAI RIVER BASIN  
IDAHO, MONTANA AND BRITISH COLUMBIA  
**BONNERS FERRY  
LEVEE PROJECT**

In 1 Sheet  
Seattle District, Seattle, Washington  
Prepared by *Ed. J. Brown*  
Reviewed by *Ed. J. Brown*  
Checked by *W. L. H.*

Scale As Shown  
October 1, 1948  
Submitted by *J. M. Gammell*  
Approved by *J. M. Gammell*  
Colonel, Corps of Engineers

Drawn by L.L.P.  
Traced by L.L.P.  
Checked by W.L.H.  
dated October 1, 1948

File No.  
L-11-3-13.1

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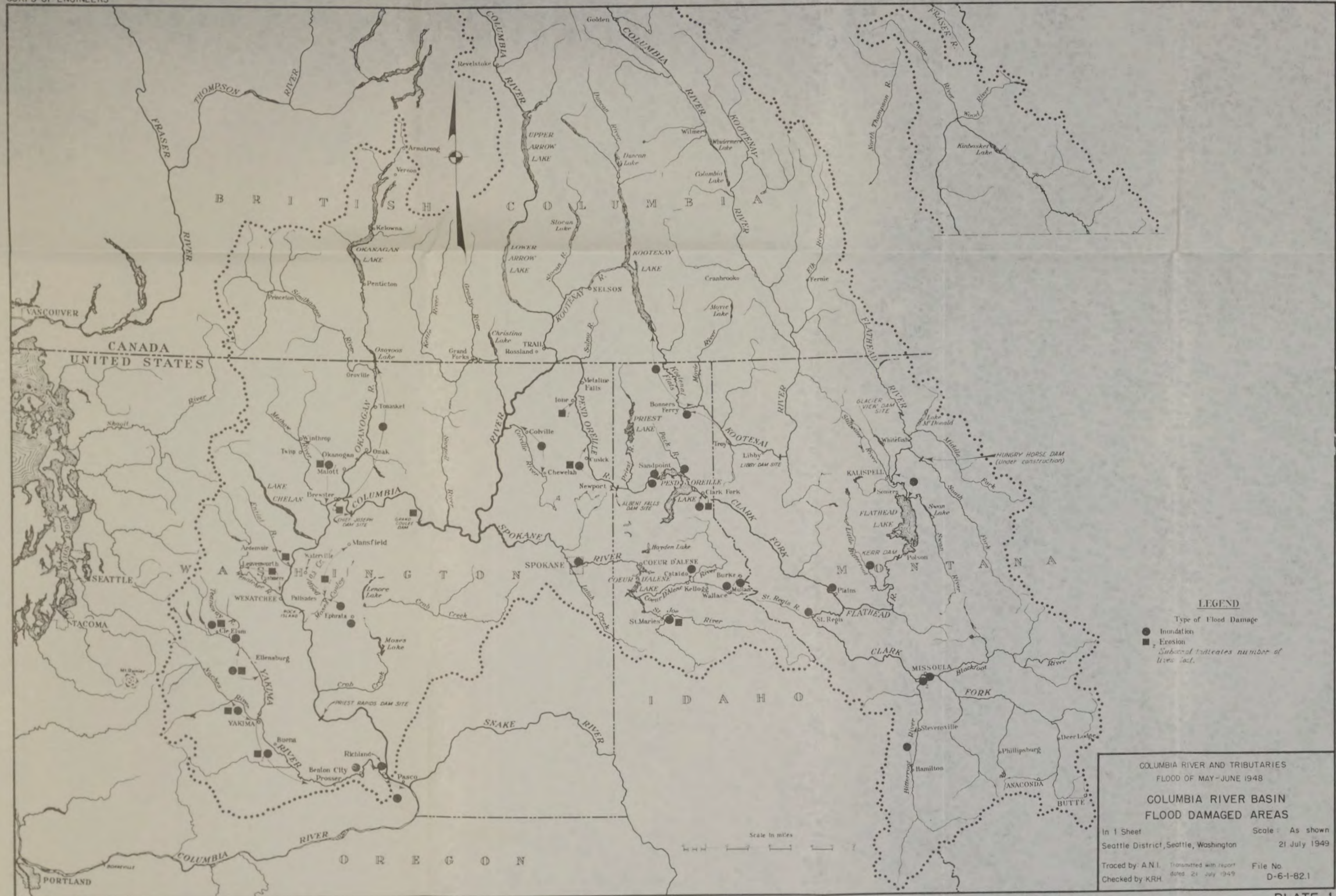
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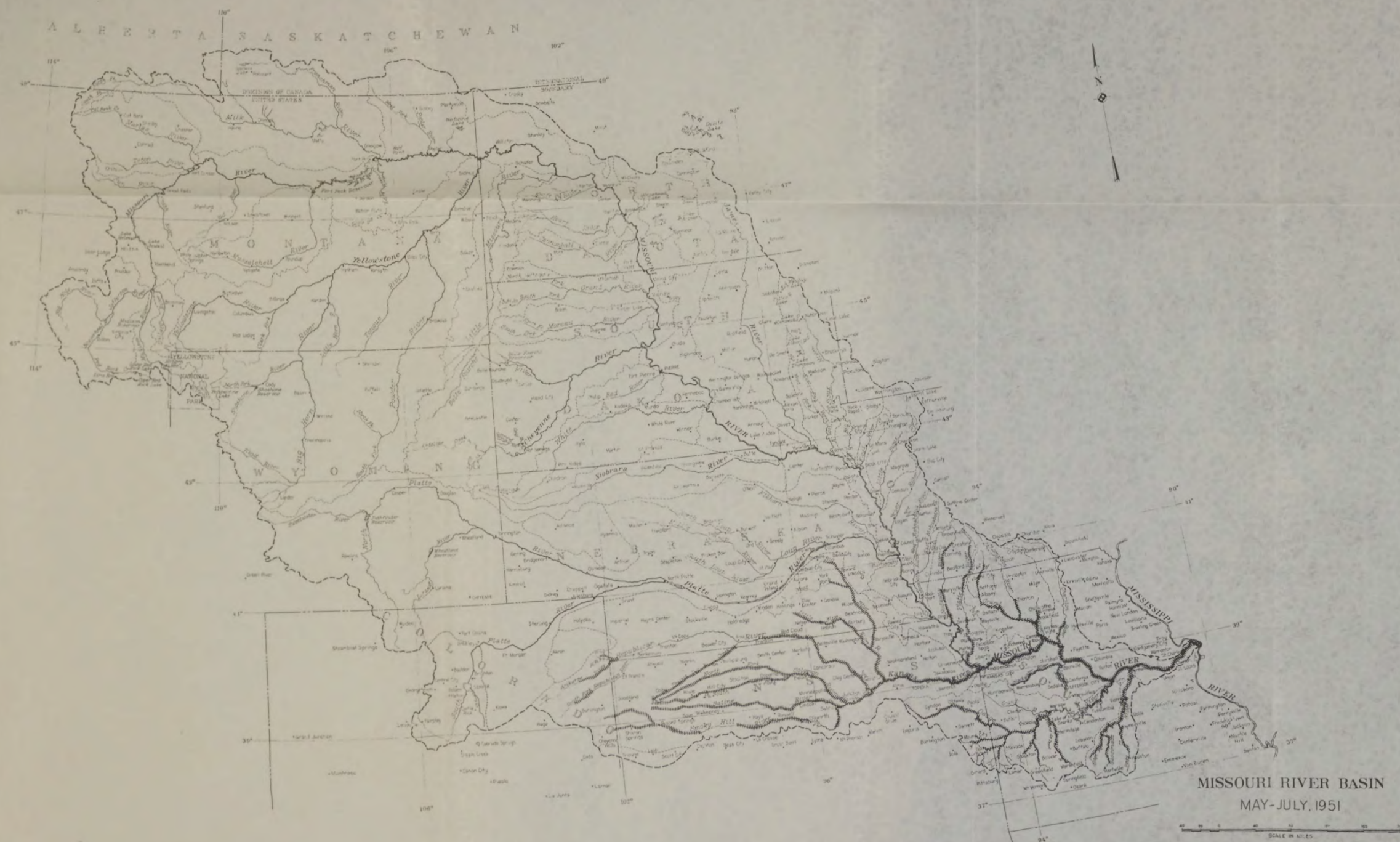
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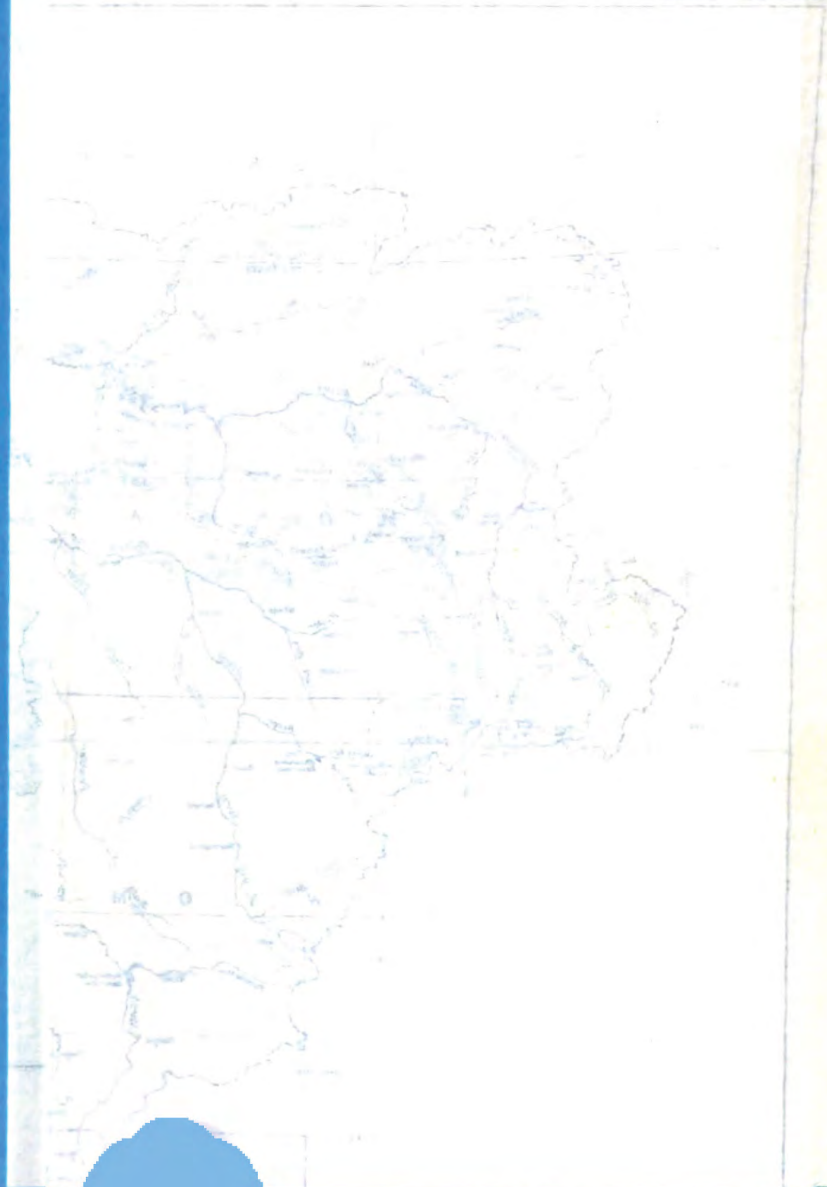
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In June, Montana suffered the largest flood experienced on the upper Missouri River since 1908.

Also in June, near James, Iowa, the Floyd River reached a height  $5\frac{1}{2}$  feet above its previous record. This resulted in considerable damage to Sioux City and the river valley.

1954.—In January, 2 storms resulting in a total of 13 inches of rain caused flooding of the Los Angeles and San Antonio Creek areas in Los Angeles and San Bernardino Counties. Earlier, fires had severely burned growth on some 22,300 acres of the headwater area. As a result, the debris load in the streams during the flood increased to such an extent that many dams proved to be inadequate.

Also in January, northern California experienced flooding of the Russian and Eel Rivers, with substantial damage near Eureka.

In January, too, heavy rains covered the area from Virginia and North Carolina to Tennessee and Arkansas and the lower Ohio River. Damage resulted in Alabama, North Carolina, South Carolina, and Georgia.

In May, the snow pack on the Kootenai Range was the heaviest ever recorded for that time of year. The peak runoff occurred at Bonners Ferry, Idaho, on May 21.

Also in May, a flash flood resulting from heavy rains hit eastern New Mexico, with heavy damage, in the Roswell area.

In June, heavy rains fell in New York from Buffalo and Syracuse to Binghamton, with considerable damage in Unadilla and in Otsego and Delaware Counties.

During May and June, heavy rain fell in Iowa amounting to as much as 10 inches of rainfall during individual storms. As a result, flood conditions occurred on the Little Sioux, Maple, Des Moines, Boone, and Shell Rock Rivers. A resulting peak occurred at Des Moines amounting to 3 feet above the previous recorded high in May 1903.

In June, severe rains occurred in West Texas in the Pecos and Devil River Basins and on the Rio Grande near Del Rio. These caused the greatest recorded flood on the Rio Grande from the mouth of the Pecos to Falcon Reservoir. Twenty-two inches of rain fell near Langtry. The peak discharge in the Rio Grande amounted to 900,000 cubic feet per second at Del Rio, compared with the previously recorded high of 600,000 cubic feet per second in 1932. Many lives were lost in Texas and Mexico, and heavy property damage was suffered.

In July, flash floods occurred in the vicinity of Richwood, W. Va. A 6-hour rain averaged 6 inches, resulting in flooding of 5 counties in the watersheds of the Gauley, Elk, and Little Kanawha Rivers.

During October, heavy rains accompanying Hurricane Hazel fell on the upper Ohio River Basin. The river went above flood stage from Pittsburgh, Pa., to Parkersburg, W. Va. Heavy damage also resulted above Pittsburgh in the Allegheny and Monongahela River Basins.

In October, 6 inches of rain fell in the vicinity of Chicago, Ill. As a result, many were made homeless and transportation facilities were crippled. Several deaths and severe damage occurred in Chicago and suburban areas in Illinois, Wisconsin, and Indiana.

1955.—Of recent memory is the damage inflicted by Hurricanes Connie, Diane, and Ione, and by a severe October storm on the east-

ern seaboard in 1955. Main areas of damage from these storms tered in South Carolina, North Carolina, Virginia, New Jersey, Pennsylvania, New York, Connecticut, Rhode Island, and Massachusetts.

The foregoing statistics serve to emphasize the nationwide distribution of flood damage.

At the request of the staff of this committee, the Office of Chief of Engineers, Department of the Army, has supplied maps designated as figures 8 to 11, showing the river basins of the Housatonic, Connecticut, Blackstone, and Thames Rivers and indicating the general areas in which severe flooding occurred on August 18-19, 1955, in New England. The accompanying table 2 compares the magnitude of these floods at key points in these basins with the largest flood in the preceding recorded period. In each instance the maximum discharge set a new record. The increase in discharge ranged from 10 percent to almost 395 percent above the preceding record discharge.

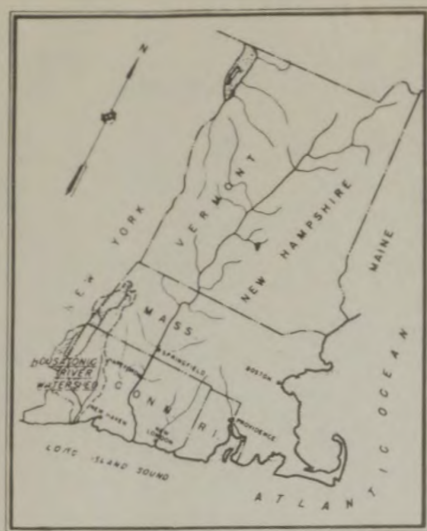
TABLE 2.—Selected provisional discharges of floods during August 1955

Stream and place	Drainage area	Period of record	Maximum discharge August 1955	Maximum previous discharge
	<i>Square miles</i>		<i>Cubic feet per second</i>	<i>Cubic feet per second</i>
Housatonic River Basin: Naugatuck River near Naugatuck, Conn.	246	1918-24, 1928 to date.	140,000	28,000
Connecticut River Basin:				
Farmington River at Rainbow, Conn. ....	584	1928 to date. ....	62,000	26,000
Westfield River near Westfield, Mass. ....	497	1914 to date. ....	61,000	55,000
Thames River Basin: Quinebaug River at Putnam, Conn.	331	1929 to date. ....	39,000	20,000

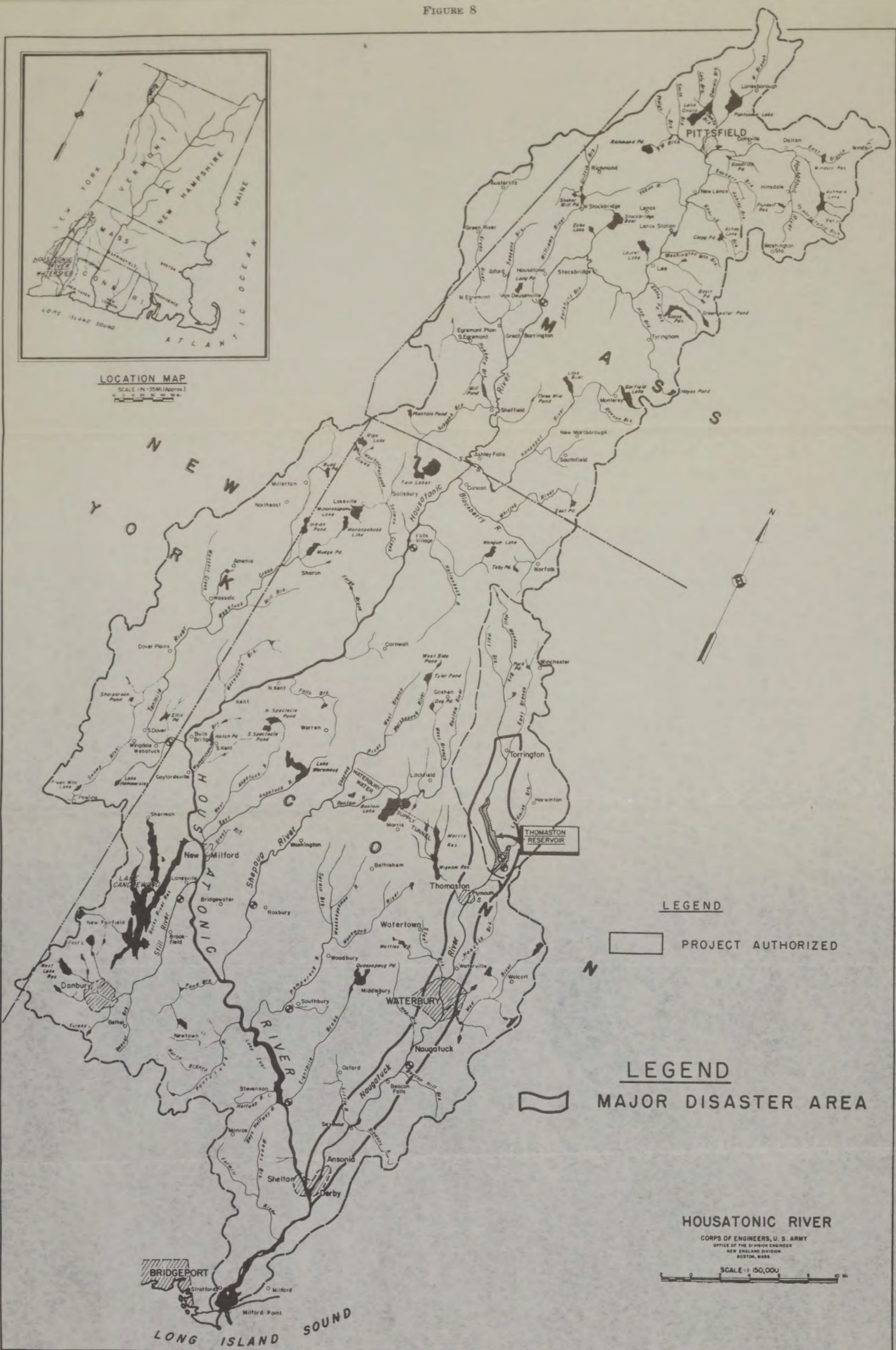
#### FREQUENCY

From many sources of measurement of water volume and height the Geological Survey data (see appendix A to this chapter, p. 50) indicate the possibility of computing flood frequency over a long period of time. In the United States, flood records go back to the year 1543, when De Soto noted the occurrence of a flood on the lower Mississippi. Unfortunately, his account left few reference points, and therefore the notation of the flood served little practical value. By contrast, Col. Henry Boquet in 1762 reported to his superior the occurrence of a flood at Fort Pitt at the head of the Ohio River at what is now Pittsburgh's Golden Triangle. This report contains specific references to height of the water, with notations of high-water marks on the physical structures which continued in existence until long after the gage record was instituted at Pittsburgh. Consequently, the record for this area runs back nearly 200 years. Over this span, 2 of the 3 highest recorded floods occurred in 1762 and 1763. The height of the latter was not exceeded during the next 173 years.

Among the next longest flood records kept in the United States are those for the Connecticut River at Hartford. "Floods" notes that since its settlement in the 1600's, flood heights have been matters of record. Physical high-water marks have been noted on structures. Early settlers made helpful notes in diaries and other writings. Flood-height data were published in the Connecticut Courant (now the Hartford Courant), first printed in 1764.



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OFFICE OF THE DIVISION ENGINEER  
NEW ENGLAND DIVISION  
BOSTON, MASS.

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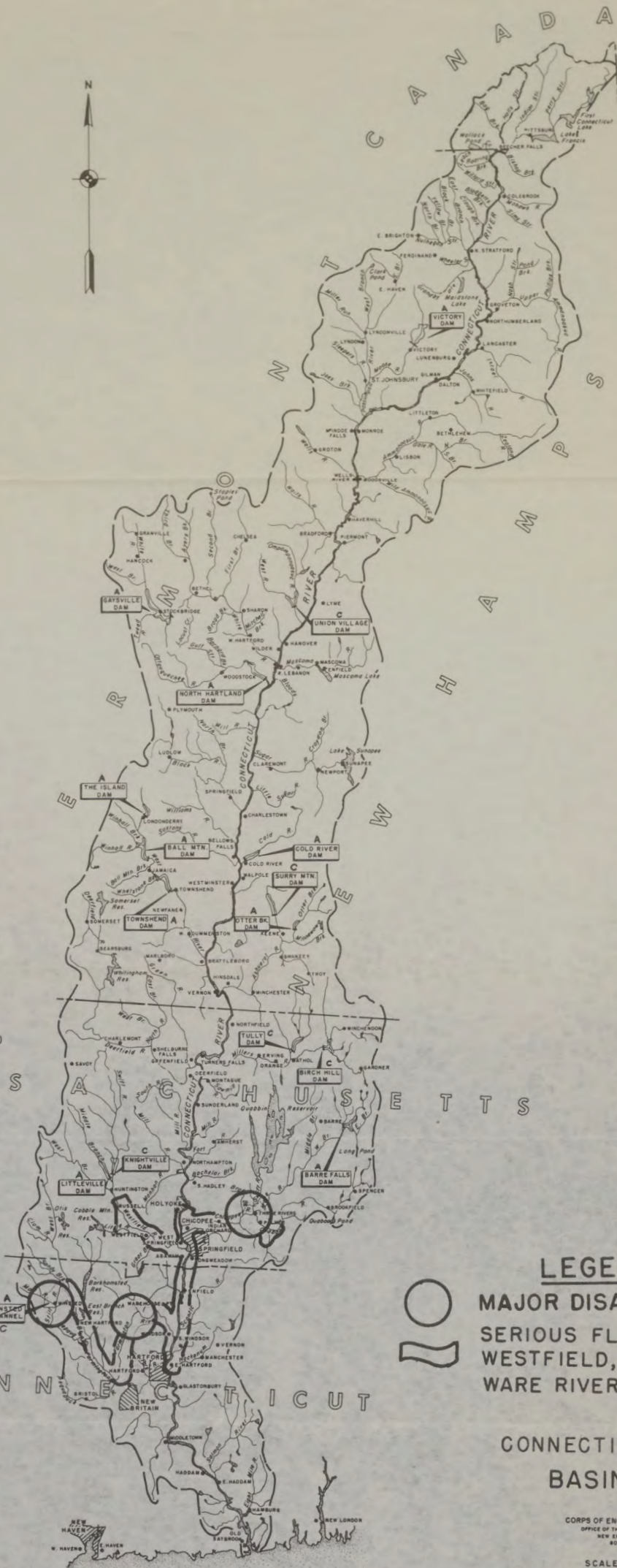
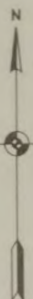
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MAJOR DISASTER AREAS  
SERIOUS FLOODING ALONG  
WESTFIELD, FARMINGTON &  
WARE RIVERS.

CONNECTICUT RIVER  
BASIN MAP

CORPS OF ENGINEERS, U. S. ARMY  
OFFICE OF THE DIVISION ENGINEER  
NEW ENGLAND DIVISION  
BOSTON, MASS.

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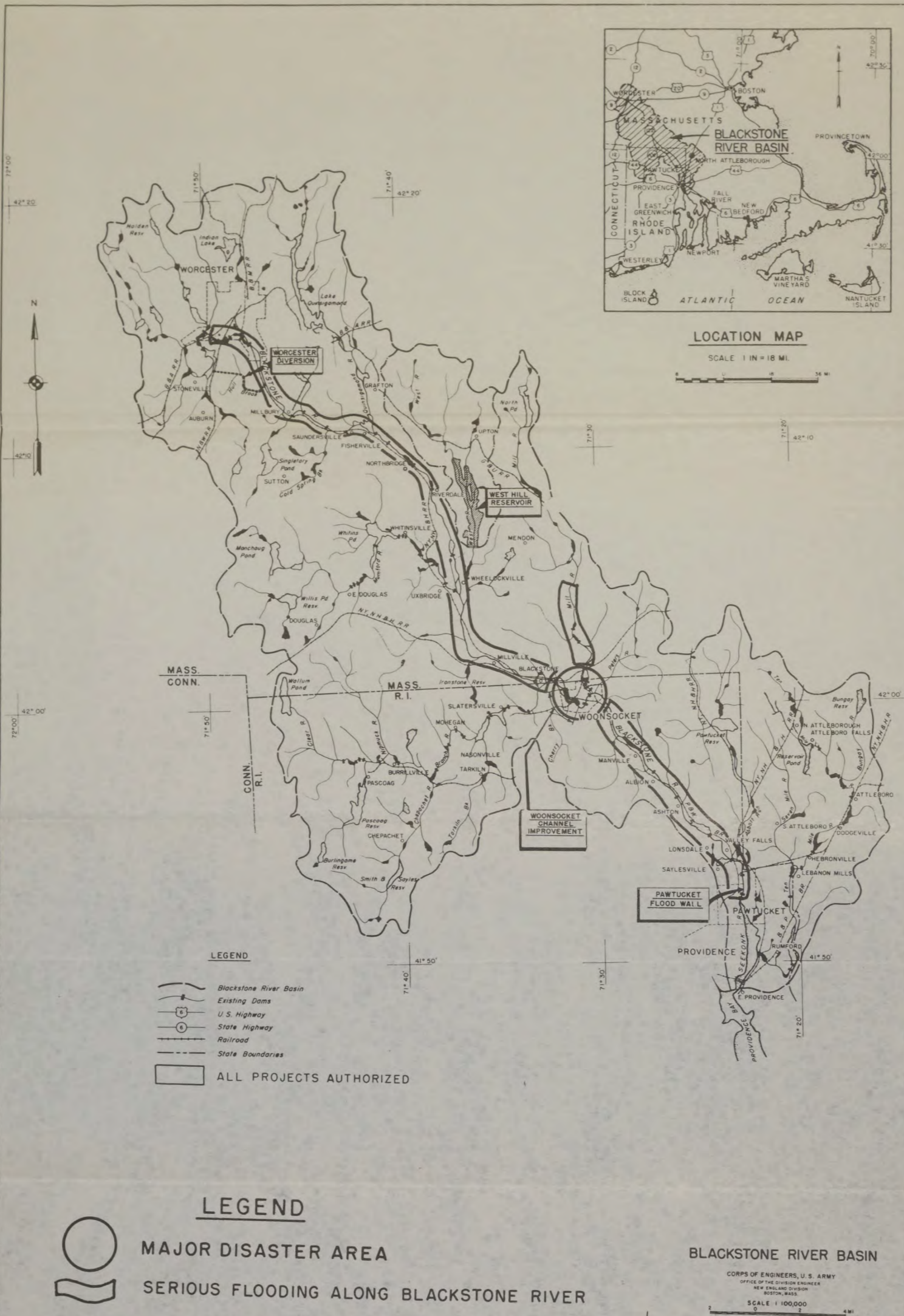
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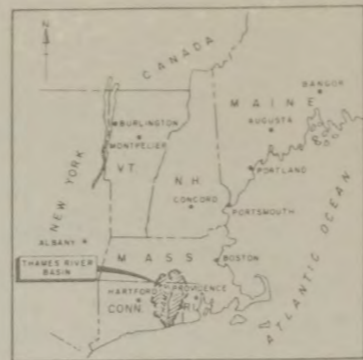
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Long records are highly desirable for frequency forecasts. River level and discharge statistics are of comparatively recent origin. Begun on the Mississippi and Ohio Rivers in the middle of the 19th century, the process has attained importance as a source of records only over the past 8 decades.

In connection with material submitted by the Corps of Engineers, Department of the Army, as being typically representative of floods occurring in the Ohio, Columbia, and Missouri River Basins, the following comments may be made concerning frequency of flooding in those three river basins.

Extensive review of flood frequencies in the Ohio Basin is currently underway by the Corps of Engineers in connection with a basinwide review investigation. It is probable that adjustments will be made on a river system basis, and other bases, to compensate for inadequacies and inconsistencies in basic data. Accordingly, it is thought preferable that no attempt be made for the purpose of this report to give flood-frequency data in terms of estimated recurrence intervals for floods of various magnitudes. Rather, table 3 lists selected major flood occurrences at several key points on the Ohio River, and provides a rough qualitative indication of frequency. It may be noted also that nominal flood stage would have been exceeded on an average of about once in 10 months at Pittsburgh, once in 19 months at Wheeling, once in 14 months at Cincinnati, and once in 18 months at Evansville, based on records since 1873, and assuming no flood-control reservoirs to be in operation. It should be recognized, however, that the basis of selection of nominal flood stage has considerable influence on the approximate frequencies indicated above. For example, the official flood stage gage height at Evansville was changed from 35 feet to 42 feet, several years ago, in response to local request.

TABLE 3.—Crest stage gage heights for selected floods

Location	Flood stage gage height—feet	Crest stage gage heights—feet										
		Recent large floods								Historical large floods		
		Mar. 1955	Oct. 1954	Feb. 1950	Apr. 1948	Mar. 1945	Dec. 1942, Jan. 1943	Jan.-Feb. 1937	Mar. 1936	Mar.-Apr. 1913	Mar. 1907	Feb. 1884
Pittsburgh.....	25 feet.....	26.9	41.2	18.9	33.1	35.2	39.4	34.5	46.0	33.6	38.7	36.5
Wheeling.....	36 feet.....	39.2	53.7	24.2	47.9	49.6	54.5	48.7	55.2	50.6	49.6	52.6
Huntington.....	50 feet.....	63.6	-----	56.6	64.5	61.4	61.7	69.4	58.8	65.3	57.3	64.5
Maysville.....	50 feet.....	63.6	-----	58.1	65.9	66.5	61.7	75.4	59.1	68.4	-----	-----
Cincinnati.....	52 feet.....	64.2	-----	59.0	65.2	69.7	61.8	80.5	60.6	69.9	62.1	71.1
Cincinnati.....	55 feet.....	66.0	-----	63.4	68.2	74.6	63.5	85.5	64.7	73.8	65.0	74.4
Evansville.....	42 feet.....	44.8	-----	45.3	45.6	48.3	45.1	53.8	44.4	48.4	43.8	48.0
Cairo.....	40 feet.....	51.0	-----	57.1	-----	55.6	-----	59.6	52.8	54.8	46.2	51.8

† Tentative values.

NOTE.—Data shown are for actual natural conditions prior to 1937 and for estimated natural conditions since that time, that is, they do not reflect the operation of local protection projects and reservoirs completed by the Corps of Engineers.

The frequency of the 1948 flood at Bonners Ferry, based on 1948 levee conditions, is estimated by the district engineer, Seattle, as about once in 34 years. He points out, however, that the frequency curve for Bonners Ferry is not and has not been stable because of the

continued construction of new levees and raising the height of existing levees of the extensive levee system downstream from that city. Levee systems in the diking districts offer variable degrees of protection because of variations in adequacy of the individual levees and extent of maintenance by the owners. These factors introduce further uncertainties into the frequency determination estimate. The water surface elevation reached at Bonners Ferry during major floods also depends upon backwater from Kootenay Lake, duration of the flood, and magnitude and timing of levee breaks during the flood. In the 1948 flood, the Kootenai River reached a maximum elevation of 1,778.32 feet. This peak elevation has a 25-year frequency, based upon the period of record 1894 and 1914 to date and upon 1955 conditions of levee improvement. At The Dalles, Oreg., and Vancouver, Wash., the frequency of the 1948 flood is estimated at once in 25 to 30 years.

The estimated frequencies of occurrence of major flood peak discharges at several key points in the Missouri River Basin is shown for the 1951 and 1952 floods in table 4.

TABLE 4.—Estimated frequencies of occurrence of major flood peak discharges at key points, 1951 and 1952—Missouri River Basin

Stream and key point	Peak discharge	Estimated frequency	
		Natural conditions	All reservoirs operating
MAY-JULY 1951 FLOOD			
Missouri River:	Cubic feet per second	Percent	Percent
Kansas City.....	573,000	1.5	0.13
Boonville.....	550,000	2.0	.25
Kansas River:			
Topeka.....	469,000	.25	-----
Bonner Springs.....	510,000	.37	-----
Marais des Cygnes River: Ottawa.....	142,000	1.0	-----
APRIL 1952 FLOOD			
Missouri River:			
Yankton, S. Dak.....	480,000	.5	1.1
Sioux City, Iowa.....	441,000	.5	1.1
Omaha, Nebr.....	396,000	.5	1.1
Nebraska City, Nebr.....	414,000	.4	1.1
St. Joseph, Mo.....	397,000	.6	1.1
Kansas City, Mo.....	400,000	8.0	.8
Boonville, Mo.....	360,000	18.0	2.0

<sup>1</sup> Very rare—beyond normal extrapolation limits of discharge-probability curve. Kansas and Osage frequencies with all reservoirs operating not immediately available.

As previously noted, hydrological experts compare floods on the frequency of their recurrence. But they recognize that a 10-year flood (occurring once on an average in 10 years) will not appear exactly every 10 years. Rather, over a long span of 1,000 years, for example, 100 10-year floods may be expected to occur. It is obvious that such information is helpful in determining flood damage potential over a long period, but is of little use in determining in exactly which years the impact of that damage will occur.

An increase in data collection facilities serves to enhance ability to forecast flood frequency with greater accuracy. In this as in many other fields of endeavor, what is past is prolog. The ability to know and record what becomes the past is of help in better forecasting the future. "Floods" notes that the new scientific branch, hydrometeorology, uses accumulated records to study the possibilities of precipita-

tion and flooding. Studies have been made to compare recent floods with the geologic record. The 1937 Ohio River flood and the 1936 and 1938 Connecticut River floods all proved, on comparison, to be higher than any others of which evidence could be found in the sediments deposited by earlier floods.

"Floods," whose authors were both associated with the Geological Survey, notes on page 66:

The study of flood frequencies enables us to judge fairly dependably from available records the frequency of floods of say 25-year or even 50-year magnitude. We can also, through hydrometeorologic and geologic studies, begin to know something of the maximum flood potentialities of a given basin. We can also assume that our records and knowledge of flood behavior will grow. Therefore, we should be able to look forward with confidence to the time when rivers will have few flood surprises in store for us.

Information given above in this study indicates that floods occur frequently in the United States, and information given below will indicate that the resulting damage is large in amount.

At this point, a note of caution should be sounded. For although flood stages and recurrence could be predicted with complete accuracy, this is not to say that resulting damage could be computed exactly. The latter calculation involves an additional process of noting the effect of the predicted flood upon the terrain in its natural or unaltered state and upon structures and personal property imperiled by the flood.

#### WARNING SERVICE

Over a short period of time, the forecasting of floods is possible and has played an important part in keeping damage to a minimum. This service began in the United States in 1871. Originally vested in the Signal Service of the United States Army, the function was transferred to the United States Weather Bureau when it was established in 1890. Through its hydrologists in river forecast centers in the larger river basins, the Bureau maintains a continuous river watch and prepares forecasts. Annual appropriations in recent years for these flood forecast services average about \$900,000, with resulting savings estimated at \$27 million. This amount should, in effect, increase as a byproduct of intensified warning service authorized by law due to hurricane damage in recent years. New methods of forecasting floods have been introduced recently. Research in this and other weather forecasting is being carried on by the Weather Bureau, other Government agencies, and private institutions.

Flood forecasts and warnings are issued by the Weather Bureau whenever soil conditions (degree of saturation) and current river stages plus reported rainfall indicate river rises to above flood stage; also when snow cover in basin, combined with rainfall and melting temperatures, indicates volume of runoff producing overflow.

Types of warnings given are noted here:

*General warnings.*—Issued as a general alert, weeks or even months in advance, on the basis of a heavy snow cover, critically distributed, and the anticipation of even normal spring rains and melting temperatures.

*Main stem forecasts.*—For the major downstream areas where the time lag is sufficient to allow routing of known upstream stages; issued several days to weeks in advance, with accuracy increasing as day of crest approaches. The stage at numerous points on the river is given.

☛ *Tributary forecasts.*—Based on known conditions in the basin and reported rainfall processed through rainfall-runoff procedures giving a stage forecast. Issued from hours to days in advance, and revised as later reports of rainfall and stage are received.

*Headwater warnings.*—Where floodwaters rise practically as the rain falls, these warnings are issued on the spot based either (a) on rainfall reports collected locally or (b) on forecasts of anticipated local heavy rainfall; issued up to 12 hours in advance, seldom specific as to stage.

The following use may be made of predictions to reduce damages:

- (a) Evacuation of people from the flood-threatened area
- (b) Removal of goods to higher levels
- (c) Removal of livestock to higher areas
- (d) Protection of fixed machinery, installations, etc., by covering, greasing, sandbagging, etc.
- (e) Inspection, maintenance and bolstering of levees
- (f) Operation of floodgates, reservoirs, and other flood-control devices
- (g) Preparation for the use of emergency general welfare measures by city, State, Corps of Engineers, Red Cross, and civil defense
- (h) Rerouting of transportation
- (i) Early or more rapid harvest of crops.

#### DAMAGE

Flood stage of a river is generally defined as that level at which the water either causes or threatens damage. Beyond that, existing estimates of the amount of damage resulting from separate floods serve only as a yardstick for comparison of the general magnitude of their destructive effect. Damage figures available unfortunately cannot be accepted as an exact mathematical calculation of the evil effects of flood.

Several factors contribute to this result. So far as we have been able to ascertain, no centralized agency has been assigned to collect all flood damage statistics. Nearly all agencies that undertake to assemble estimates of damage engage in the task as a sideline. Moreover, there seems to be no uniformity on ground rules concerning precisely which elements of damage will be considered. Some consider privately owned real property while some include privately owned personal property. Other areas involved are government-owned real property (Federal, State, and local). Crop and pasture damage and soil erosion sometimes come in for separate treatment in damage estimates, in conjunction with other agricultural losses such as livestock and farm buildings and equipment. By contrast, "urban" damage estimates appear for industrial and commercial buildings and equipment and residences. Separate estimates are often made for damage to highways and railways. Publicly owned facilities and structures are often treated as a separate category for the purpose of estimating flood damage.

Added to these items are the problems of assessing indirect damage for such items as (a) business interruption with resulting income loss to entrepreneur, employee and investor, (b) health hazards, (c) tax losses and (d) sociological changes.

Lacking are private sources of fairly reliable statistics similar to those that exist where private insurance carriers honor disaster loss claims. The coverage offered by private carriers against flood damage is confined to very limited types of insurance.

Moreover, once items are selected for the compilation of damage statistics, the method of collection is usually far from scientific. It seems to be a truism that early estimates of damage given immediately following a flood tend to be high. Press accounts recounting these estimates therefore probably tend to overemphasize the actual amount of damage. Damage sometimes seems greater than it later proves to be. Structures, which at the time appear to have lost their economic life, often find their way back into use.

Enough has been set down here to indicate the danger of relying upon the value of specific damage estimates. With that note of caution, however, the staff has attempted to assemble the most reliable flood damage estimates available. The United States Weather Bureau and the Corps of Engineers of the United States Army draw their flood damage estimates from the Nation as a whole.

#### *Weather Bureau estimates*

The United States Weather Bureau has presented 3 tables and 1 figure pertinent to damage estimates.

Table 5 sets forth statistics concerning loss of life and property in the United States from floods during the period 1924 to 1955.

Table 6 presents figures for loss to life and property resulting from individual great floods in the United States from July 1902 through August 1955 identifying the flood locality.

Appendix B, page 57, sets forth by districts and by years from 1902 through 1953 life and property flood losses in the United States.

TABLE 5.—*Loss of life and property in the United States from floods, 1924-55*<sup>1</sup>

Year	Property	Lives	Year	Property	Lives
1924.....	\$16,979,745	27	1940.....	\$40,466,483	60
1925.....	9,922,035	36	1941.....	39,524,600	47
1926.....	23,469,749	16	1942.....	98,506,198	68
1927.....	347,658,422	423	1943.....	199,733,145	107
1928.....	44,613,564	15	1944.....	101,079,400	33
1929.....	68,099,002	89	1945.....	165,796,900	91
1930.....	15,850,125	14	1946.....	70,813,500	28
1931.....	2,809,975	0	1947.....	272,328,100	55
1932.....	10,295,235	11	1948.....	229,960,400	82
1933.....	36,679,474	33	1949.....	93,931,900	48
1934.....	10,361,360	88	1950.....	176,049,100	93
1935.....	127,129,624	236	1951.....	1,028,741,500	51
1936.....	282,540,260	142	1952.....	254,064,400	54
1937.....	440,739,529	142	1953.....	122,203,400	40
1938.....	101,099,645	180	1954.....	99,149,200	44
1939.....	13,833,806	83	1955.....	1,031,795,000	182

<sup>1</sup> 1955 partly estimated.

TABLE 6.—*Losses in individual great floods in the United States since July 1902*

Date	Locality	Lives <sup>1</sup>	Property
May-June 1903.....	Kansas, lower Missouri, and upper Mississippi Rivers.....	100	\$40,000,000
July 1908.....	Missouri River.....		9,339,000
	Upper Mississippi River.....		5,600,000
	Red River.....		16,200,000
July 1909.....	Missouri River east of Kansas City.....		5,500,000
March 1912.....	Lower Mississippi River.....		70,000,000
March 1913.....	Ohio River and tributaries.....	467	147,000,000
	Mississippi River.....		7,000,000
December 1913.....	Texas rivers.....	177	9,000,000
June 1915.....	Kansas River.....		5,950,000
August 1916.....	Rivers of the Carolinas.....		21,700,000
June 1921.....	Arkansas River in State of Colorado.....	120	25,000,000
September 1921.....	Texas rivers.....	215	19,000,000
April-May 1922 <sup>1</sup> .....	Upper Mississippi River.....		4,700,000
	Ohio Valley.....		4,000,000
	Lower Mississippi River.....		7,500,000
October 1923.....	Lower Arkansas, including the State of Oklahoma.....		15,000,000
March 1924.....	Potomac River.....		6,000,000
Spring of 1927.....	Mississippi Valley.....	313	284,117,631
August 1927.....	Arkansas River and tributaries.....		3,440,000
November 1927.....	New England rivers.....	88	45,577,700
June 1928.....	Ohio Valley.....		7,535,500
August 1928.....	South Atlantic drainage.....		4,400,000
September 1928.....	do.....		4,000,000
March-June 1929.....	East gulf drainage.....		8,000,000
	Ohio Valley.....		16,500,000
	Missouri Valley.....		2,000,000
	Upper Mississippi Valley.....		3,600,000
	Lower Mississippi Valley.....		10,000,000
	Arkansas-White Valley.....		2,700,000
	Rivers in Texas.....		8,000,000
July 1929.....	Rivers in central Kansas.....		4,000,000
October 1929.....	Rivers in Southeastern States.....		9,000,000
January 1930.....	White-Wabash Rivers.....		7,000,000
May 1930.....	Red River and tributaries.....		3,000,000
September-October 1932.....	Lower Rio Grande.....		2,500,000
March 1933.....	Ohio River.....		2,000,000
December 1933.....	Columbia River and tributaries.....		10,000,000
May 1935.....	Rivers in eastern Colorado.....		6,000,000
May-June 1935.....	Republican and Kansas Rivers.....	110	18,000,000
	Lower Missouri River.....		10,000,000
July 1935.....	Upper Susquehanna tributaries.....	52	26,000,000
December 1935.....	Houston, Tex., area.....		2,500,000
March-April 1936.....	Rivers in eastern United States.....	107	270,000,000
July 1936.....	Rivers in central Texas.....		2,000,000
September 1936.....	Rivers in central and northern Texas.....		5,000,000
January-February 1937.....	Ohio and lower Mississippi River Basins.....	137	417,685,000
December 1937.....	Sacramento Valley.....		7,100,000
March 1938.....	Streams in southern California.....	79	24,500,000
September 1938.....	Rivers in New England.....		37,000,000
July 1939.....	Licking and Kentucky Rivers.....	78	1,715,000
February-March 1940.....	Sacramento Valley.....		6,700,000
August 1940.....	Rivers in southern Virginia, the Carolinas, and eastern Tennessee.....	40	12,000,000
October-November 1941.....	Arkansas River Basin.....		8,500,000
April-June 1942.....	Upper Mississippi, Missouri, Arkansas, Red, and Trinity River Basins.....		44,350,000
May 1942.....	Delaware and Susquehanna River Basins.....	33	13,000,000
July 1942.....	Upper Allegheny River and Sinnemahoning Creek Basins.....	15	10,000,000
November-December 1942.....	Willamette River.....	10	6,900,000
December 1942-January 1943.....	Ohio River.....		10,540,000
April-June 1943.....	Maumee, Wabash, upper Mississippi, Missouri, White, and Arkansas River Basins.....	60	172,500,000
August 1943.....	Little Kanawha.....	23	1,300,000
April-June 1944.....	Upper Mississippi, Missouri, Arkansas, Red, lower Mississippi Basins and east Texas streams.....	17	82,000,000
February-March 1945.....	Ohio River.....	18	30,000,000
February-April 1945.....	Trinity and Sabine Rivers.....		9,000,000
March-July 1945.....	Lower Mississippi River.....		9,500,000
July 1945.....	Lake section of Rensselaer County, N. Y.....		3,500,000
December 1945.....	Willamette River.....	9	6,000,000
January 1946.....	Cumberland River.....		3,925,000
	Tennessee River and tributaries.....		4,500,000
May-June 1946.....	Trinity River.....		4,150,000
September 1946.....	San Antonio and Nueces Rivers.....	9	6,050,000
December 1946.....	Willamette River.....		5,525,000
April 1947.....	Allegheny River.....		4,319,000

See footnotes at end of table, p. 39.

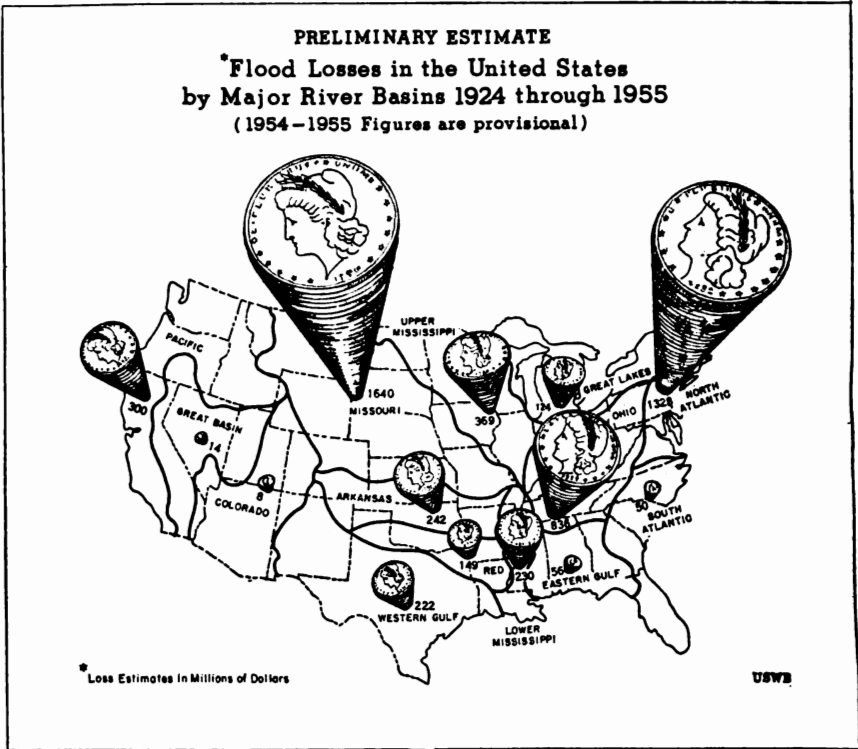
TABLE 6.—*Losses in individual great floods in the United States since July 1902—Continued*

Date	Locality	Lives <sup>1</sup>	Property
May-July 1947.....	Rivers in Middle West in the lower Missouri and middle Mississippi River Basins.	29	\$235,000,000
June 1947.....	East Creek at Rutland, Vt.	—	2,000,000
March 1948.....	Susquehanna River and tributaries	—	4,300,000
April-May 1948.....	Red River of the North and tributaries	—	18,700,000
May-June 1948.....	Columbia Basin	37	112,000,000
June-July 1948.....	Arkansas River and minor tributaries	—	14,500,000
December 1948.....	Housatonic River	—	4,200,000
April 1949.....	Rio Grande	—	3,300,000
May 1949.....	Trinity River	10	14,000,000
June 1949.....	Shenandoah and Potomac Rivers	11	8,850,000
April-May 1950.....	Red River of the North	9	\$33,000,000
June 1950.....	Central West Virginia	31	4,020,000
November-December 1950.....	Central Valleys of California and western Nevada	—	\$23,000,000
February 1951.....	Western Washington	—	2,088,300
March-April 1951.....	Alabama-Georgia	—	3,292,200
April 1951.....	Upper Mississippi Basin	—	18,622,200
June-July 1951.....	Kansas-Missouri	25	935,224,000
January-February 1952.....	Ohio River	1	1,897,500
April 1952.....	Red River of the North-Upper Mississippi-Missouri River Basins.	11	198,000,000
May 1952.....	Great Basin	—	8,372,800
September 1952.....	West Gulf of Mexico drainage	6	7,761,800
January 1953.....	Northern California, Oregon, and Washington	—	5,970,700
March 1953.....	New England States	1	10,000,000
April-May 1953.....	Louisiana-Texas	12	38,959,000
June 1953.....	Northwestern Iowa	14	32,950,300
June 1954.....	Iowa and adjacent States	4	27,740,000
Do.....	Middle Rio Grande and Lower Pecos Rivers	16	19,080,000
October 1954.....	Upper Ohio flood	4	16,220,000
Do.....	Chicago area flood	0	15,000,000
Do.....	Upper Pecos River in New Mexico	13	2,370,000
March 1955.....	Ohio River	3	12,570,000
Do.....	Tombigbee River	1	2,480,000
April 1955.....	Pearl and Pascagoula Rivers in Mississippi	4	1,820,000
May 1955.....	Purgatoire River in Colorado	1	4,800,000
August 1955.....	Hurricane floods in Northeast	167	\$1,000,000,000

<sup>1</sup> Loss of life carried only where considerable.<sup>2</sup> No lives lost in Mississippi Valley floods of 1922.<sup>3</sup> Partly storm damage caused by tropical disturbance.<sup>4</sup> Preliminary.<sup>5</sup> Estimated.

Figure 12 presents in pictograph form flood losses in the United States by major river basins from 1924 through 1955.

FIGURE 12



Cursory examination of these statistics in general and table 1 in particular shows the great variance in total flood damage to property from year to year. During the past 31 years, the nadir occurred in 1931 with a low of \$2.8 million and the zenith in 1951 with a high of slightly over \$1 billion (unless higher preliminary estimates for 1955 in the amount of \$1,031,795,000 are accepted). Because of this variation, the average annual loss over this period of years bears little relation to the actual loss occurring in any given year. Accepting these statistics as accurate, this points up the difficulty of determining in advance in which particular year the impact of heavy flood loss is apt to occur. This is one factor noted by private insurers who fear the impact may arrive in bankrupting force before an insurer has had an opportunity to build up adequate reserves for payment of losses. Table 6 shows a similar disparity in annual flood losses even within particular river basins.

Weather Bureau statistics are for the most part based on questionnaires handed out following floods to such persons as county agents, mayors, county and city engineers, postmasters, and river observers. Returns deal largely with direct property loss. They are reviewed and coordinated to avoid duplication.

At the time "Floods" was written, it noted the Weather Bureau's figures averaged roughly \$150 million per year from 1926 to 1950. Table 5 alone, however, throws this average out of joint. For the 2 years prior to 1926, the annual average dropped to only about \$13 million. For the 5 years following 1950, the annual average jumped to about \$500 million. Apparently to arrive at any meaningful average, it is essential that a very long span of years be used as a base.

### *Corps of Engineers' estimates*

Corps of Engineers' estimates are largely based on postflood surveys and flood-control investigations. Around 1950, the corps estimated average flood losses at about \$500 million per year, arrived at by noting \$309 million annual damage prevention by means of flood-control projects existing then as compared with potential flood damage of \$809 million per year as of the 1948 status of river valley development. It has been suggested that these estimates include indirect damage.

As part of its contribution in supplying statistics for typical major floods, the Corps of Engineers, Department of the Army, has submitted estimates of damage resulting from designated major floods in the three respective basins of the Ohio, Columbia, and Missouri Rivers.

The basic estimates of damage for the flood of March 1936 and the flood of January 1937 in the Ohio River Basin are set forth on pages 27 and 28 of the record of hearings before the Committee on Flood Control, House of Representatives, 75th Congress, 1st session, on levees and flood walls, Ohio River Basin, H. R. 7393 and H. R. 7646 (Comprehensive Flood Control Plan for Ohio and Lower Mississippi Rivers). These estimates are set forth in table 7 for ready reference. Table 8 summarizes these data by principal categories of damage:

TABLE 7.—Flood damages in Ohio River Basin for 1937 and 1936

	1937	1936		1937	1936
<b>PITTSBURGH DISTRICT</b>			<b>ZANESVILLE DISTRICT</b>		
Pittsburgh, Pa.	\$3, 100, 000	\$53, 000, 000	Muskingum River Basin	\$3, 300, 000	-----
McKees Rocks, Pa.	425, 000	5, 500, 000	<b>HUNTINGTON DISTRICT</b>		
Neville Island, Pa.	14, 000	142, 000	Powhatan Point, Ohio	42, 000	\$75, 000
Coraopolis, Pa.	37, 000	1, 240, 000	Woodlands, W. Va.	3, 000	-----
Leetsdale, Pa.	4, 000	100, 000	Clarington, Ohio	25, 000	50, 000
Rochester, Pa.	2, 000	110, 000	Proctor, W. Va.	3, 000	8, 000
West Bridgewater, Pa.	14, 000	1, 260, 000	New Martinsville, W. Va.	340, 000	433, 000
Industry, Pa.	5, 000	41, 000	Brooklyn, W. Va.	32, 000	54, 000
Smiths Ferry, Pa.	6, 000	61, 000	Sardis, Ohio	2, 000	5, 000
Wellsville, Ohio	5, 000	890, 000	Sistersville, W. Va.	12, 000	26, 000
Strattonville, Ohio	12, 000	104, 000	Friendly, W. Va.	7, 000	12, 000
Empire, Ohio	20, 000	200, 000	New Matamoras, Ohio	7, 000	9, 000
New Cumberland, W. Va.	36, 000	236, 000	St. Marys, W. Va.	42, 000	67, 000
Foilsansbee, W. Va.	29, 000	585, 000	Newport, Ohio	3, 000	6, 000
Mingo Junction, Ohio	63, 000	190, 000	Waverley, W. Va.	11, 000	13, 000
Wellsburg, W. Va.	110, 000	1, 640, 000	Marietta and West Marietta, Ohio	1, 300, 000	236, 000
Brilliant, Ohio	12, 000	180, 000	Williamstown, W. Va.	42, 000	8, 000
Warwood, W. Va.	15, 000	114, 000	Riverview, W. Va.	16, 000	-----
Martins Ferry, Ohio	9, 000	1, 960, 000	Belpre, Ohio	80, 000	6, 000
Wheeling, W. Va.	900, 000	3, 900, 000	Parkersburg, W. Va.	1, 400, 000	289, 000
Benwood, W. Va.	221, 000	1, 000, 000	Hockingport, Ohio	6, 000	-----
Bellaire, Ohio	153, 000	2, 560, 000	Portland, Ohio	3, 000	2, 000
Moundsville, W. Va.	23, 000	187, 000	Ravenswood, W. Va.	15, 000	-----
Cambria County, Pa.	-----	60, 000, 000	Millwood, W. Va.	3, 000	-----
Damages on tributaries, and to public utilities, highways, railways, and farms, etc., outside of towns	1, 582, 000	63, 800, 000	Letart, W. Va.	2, 000	1, 000
			Letart Falls, Ohio	6, 000	1, 000
<b>Total</b>	<b>6, 800, 000</b>	<b>199, 000, 000</b>	Racine, Ohio	60, 000	11, 000
			Syracuse, Ohio	42, 000	2, 000

TABLE 7.—Flood damages in Ohio River Basin for 1937 and 1938—Continued

	1937	1938		1937	1938
<b>HUNTINGTON DISTRICT—continued</b>			<b>CINCINNATI DISTRICT—con.</b>		
Hartford, W. Va.	\$24,000		Damages to public utilities, highways, railways, farms, etc., outside city and town areas.	\$25,200,000	None
Mason City, W. Va.	60,000	\$6,000	Total	119,000,000	None
Pomeroy, Ohio	315,000	71,000	<b>LOUISVILLE DISTRICT</b>		
Clifton, W. Va.	6,000	2,000	Milton, Ky.	141,000	None
Middleport, Ohio	515,000	37,000	Madison, Ind.	496,000	None
Cheshire, Ohio	95,000		Westport, Ky.	11,000	None
Point Pleasant, W. Va.	550,000	150,000	Utica, Ind.	208,000	None
Henderson, W. Va.	100,000	30,000	Jeffersonville and Clarksville, Ind.	10,000,000	None
Mapleshade, Ohio	37,000		Louisville, Ky.	94,500,000	None
Gallipolis, Ohio	165,000	19,000	New Albany, Ind.	5,000,000	None
Chambersburg, Ohio	3,000		West Point, Ky.	710,000	None
Miller, Ohio	21,000	1,000	Mauckport, Ind.	118,000	None
Athalia, Ohio	22,000	1,000	New Amsterdam, Ind.	212,000	None
Proctorville, Ohio	240,000	7,000	Leavenworth, Ind.	272,000	None
Huntington and Guyandot, W. Va.	14,600,000	612,000	Alton, Ind.	17,000	None
Chesapeake, Ohio	4,000		Concordia, Ky.	11,000	None
Burlington, Ohio	7,000		Derby, Ind.	22,000	None
Ceredo and Kenova, W. Va.	2,700,000	25,000	Rome, Ind.	11,000	None
South Point, Ohio	32,000		Cloverport, Ky.	60,000	None
Catlettsburg, Ky.	2,000,000	39,000	Hawesville, Ky.	90,000	None
Damages to public utilities, highways, railways, farms, etc., outside of cities and towns.	1,500,000	186,000	Cannelton, Ind.	270,000	None
Total	26,500,000	2,500,000	Tell City, Ind.	1,800,000	None
<b>CINCINNATI DISTRICT</b>			Troy, Ind.	53,000	None
Normal, Ky.	130,000	None	Lewisport, Ky.	130,000	None
Ashland, Ky.	3,200,000	None	Grandview, Ind.	254,000	None
Coalgrove, Ohio	175,000	None	Rockport, Ind.	63,000	None
Russell, Ky.	350,000	None	Owensboro, Ky., and Evansville, Ind.	114,000	None
Ironton and Hanging Rock, Ohio	7,600,000	None	Howell, Ind.	12,100,000	None
Greenup, Ky.	510,000	None	Uniontown, Ky.	386,000	None
Scioteville, Ohio	117,000	None	Shawneetown, Ill.	1,100,000	None
New Boston, Ohio	5,600,000	None	Caseyville, Ky.	23,000	None
Portsmouth, Ohio	15,300,000	None	Cave-in-Rock, Ill.	8,000	None
Fullerton, Ky.	250,000	None	Tolu, Ky.	9,000	None
South Portsmouth, Ky.	85,000	None	Elizabethtown, Ill.	20,000	None
Buena Vista, Ohio	130,000	None	Rosiclare, Ill.	100,000	None
Vanceburg, Ky.	1,120,000	None	Golconda, Ill.	40,000	None
Manchester, Ohio	680,000	None	Smithland, Ky.	114,000	None
Maysville, Ky.	1,370,000	None	Paducah, Ky.	25,500,000	None
Aberdeen, Ohio	130,000	None	Brockport, Ill.	400,000	None
Ripley, Ohio	650,000	None	Metropolis, Ill.	472,000	None
Dover, Ky.	70,000	None	Harrisburg, Ill.	4,000,000	None
Higginsport, Ohio	190,000	None	Belknap, Ill.	16,000	None
Augusta, Ky.	580,000	None	Karnak, Ill.	60,000	None
Chile, Ohio	140,000	None	Ullin, Ill.	18,000	None
Moscow, Ohio	560,000	None	Damages to public utilities, highways, railways, farms, etc., outside city and towns.	89,071,000	None
New Richmond, Ohio	920,000	None	Total	248,000,000	None
California, Ohio	500,000	None	<b>NASHVILLE DISTRICT</b>		
Cincinnati, Ohio	35,000,000	None	<b>Cumberland River Basin.</b>		
Dayton, Ky.	1,320,000	None		5,000,000	None
Bellevue, Ky.	270,000	None	<b>MEMPHIS DISTRICT</b>		
Newport, Ky.	3,900,000	None	Cafo, Ill.	110,000	None
Covington, Ky.	5,300,000	None	Mounds City, Ill.	1,690,000	None
Ludlow, Ky.	435,000	None	Mounds, Ill.	800,000	None
Bromley, Ky.	133,000	None	Total	2,600,000	None
Lawrenceburg, Ind.	3,900,000	None			
Aurora, Ind.	1,980,000	None			
Rising Sun, Ind.	85,000	None			
Patriot, Ind.	240,000	None			
Vevay, Ind.	200,000	None			
Carrollton, Ky.	550,000	None			
Prestonville, Ky.	130,000	None			

TABLE 7.—*Flood damages in Ohio River Basin for 1937 and 1936—Continued*

SUMMARY	1937	1936
Pittsburgh district.....	\$6,800,000	\$199,000,000
Zanesville district.....	3,300,000	
Huntington district.....	26,500,000	2,500,000
Cincinnati district.....	119,000,000	
Louisville district.....	248,000,000	
Nashville district.....	5,000,000	
Total.....	408,600,000	201,500,000
Memphis district.....	2,600,000	
Grand total.....	411,200,000	201,500,000

TABLE 8.—*Summary of flood damages in Ohio River Basin for 1937 and 1936*

Item	1937 flood	1936 flood
Direct physical damages:		
To fixed real property.....	\$162,000,000	\$84,000,000
To contents and stocks.....	109,000,000	45,000,000
Subtotal.....	(271,000,000)	(129,000,000)
Related direct damage: <sup>1</sup> (including suspension of business, depreciation of property values and organized evacuation and relief and related personal costs).....	137,600,000	72,500,000
Total direct damage.....	408,600,000	201,500,000
Intangible damage.....	( <sup>2</sup> )	( <sup>2</sup> )

<sup>1</sup> The term "related direct damage" is used in the above tabulation to describe damages of types generally classified as "indirect damage" under present practice.

<sup>2</sup> Not evaluated.

The foregoing damage estimates are based on prices and development current at the time of flood. Insofar as the figures on direct physical damage are concerned, they are thought to be quite conservative. The relative conservatism and optimism of the "related direct damage" estimates cannot be determined without extensive review not considered warranted for the present purpose. It is believed, however, that recurrence of the 1936 and 1937 floods under present conditions of development and values, but with flood-control construction at the negligible level that prevailed in those years, would result in total direct damages at least 3 times greater for the 1937 flood and as much as 4 times greater for the 1936 flood.

Flood damages suffered throughout the Columbia River Basin due to the flood of May-June 1948 are estimated to have totaled \$110,071,800, based on 1948 price levels, distributed as follows:

Stream or area	Amount of damage
Clark Fork.....	\$3,658,500
Flathead River.....	661,500
St. Regis River.....	60,000
Kootenai River.....	5,792,000
Spokane River.....	848,000
Yakima River.....	2,263,000
Naches River.....	172,500
Okanogan River.....	2,000,000
Methow River.....	2,250,000
Entiat River.....	500,000
Wenatchee River.....	246,800
Colville River.....	50,000
Moses Coulee.....	1,125,000
Snake River Basin.....	5,437,400
Columbia River (main stem above Yakima River).....	100,000
Columbia River (main stem below Yakima River).....	84,907,100
Total.....	110,071,800

Available data permit a breakdown of the above to show damages to fixed real property only for the Kootenai River and the Columbia River below the mouth of Yakima River. Along the Kootenai River, damage at Bonners Ferry amounted to \$230,000; of which \$150,000 was damage to fixed real estate; \$51,500 was damage due to traffic interruptions, debris removal, etc., and \$28,500 represented the cost of flood fighting. Damage to the Kootenai Flats leveed areas, extending from about 4 miles upstream from Bonners Ferry downstream to the Canadian border, amounted to \$4,770,000, while damage to the Great Northern Railway in that area was estimated at \$217,000. Flood damages upstream from Bonners Ferry within the United States amounted to \$575,000.

Details of damages suffered along the main stem of the Columbia River below the mouth of Yakima River and along the Snake River during the 1948 flood have been summarized below in table 9 to show flood damages along the Columbia River below the Yakima River in the available categories, with damage to fixed real property shown separately in each instance:

TABLE 9.—Flood damage, Columbia River, 1948

Type of damage	Damage to fixed real property <sup>1</sup>	Other damages	Total damages
Agricultural.....	\$2,778,900	\$10,223,800	\$13,002,700
Residential.....	17,368,100	7,403,700	24,771,800
Commercial.....	1,857,900	4,403,000	6,260,900
Industrial.....	1,581,100	19,526,700	21,107,800
Utilities.....	489,000	1,173,900	1,662,900
Public property.....	261,300	3,926,500	4,187,800
Transportation.....	2,822,700	5,308,300	8,131,000
Flood control.....	<sup>2</sup> 1,910,000	2,671,700	4,581,700
Public aid.....		1,200,500	1,200,500
<b>Total.....</b>	<b>29,069,000</b>	<b>55,838,100</b>	<b>84,907,100</b>

<sup>1</sup> Grounds, buildings, and improvements.

<sup>2</sup> Total direct damages.

A further breakdown of damages by types and locations is given in appendix C, page 62, originating from reports prepared in the Corps of Engineers.

In the flood of May–July 1951, centered over the Kansas River Basin, extremely heavy losses were suffered at the Kansas Citys and at a number of urban centers along the Kansas River.

Estimated direct damage to physical property throughout the Missouri River Basin for this flood totaled \$522,810,000. This damage by categories is shown for principal damage centers in table 10. In addition to these direct damages in urban centers, there were heavy losses in agricultural areas as well as large indirect losses. Estimates of these losses are stated by the corps to be currently under review.

In the flood of April 1952, total direct damage was estimated at \$121,257,000. Agricultural losses made up a large part of the total. Direct damage by categories at five principal urban damage centers is shown in table 10.

**TABLE 10.**—*Estimated direct flood damages at principal damage centers in Missouri River Basin 1951 and 1952 floods*

1951

Damage category	Salina, Kans.	Topeka, Kans.	Lawrence, Kans.	Kansas Citys, Mo. and Kans.	Ottawa, Kans.	River- side, Mo.	Man- hattan, Kans.
Business.....	\$190,280	\$10,476,430	\$632,880	\$118,741,970	\$2,766,760	\$381,890	\$5,448,700
Residential.....	1,717,750	8,935,750	613,270	29,821,250	1,342,140	-----	3,126,950
Public property.....	253,400	2,061,000	254,160	8,055,030	264,350	-----	821,700
Transportation.....	4,300	4,384,800	80,000	65,015,100	100,000	-----	642,100
Communications and utilities.....	1,020	664,100	99,990	2,377,680	38,010	-----	100,650
Flood-control works.....	-----	246,800	-----	7,191,200	-----	-----	-----
Urban agricultural.....	-----	240,010	-----	770,830	-----	-----	-----
<b>Total.....</b>	<b>2,166,750</b>	<b>27,008,890</b>	<b>1,680,300</b>	<b>231,973,060</b>	<b>4,511,260</b>	<b>381,890</b>	<b>10,140,100</b>

1952

Damage category	Sioux City, Iowa	South Sioux City, Nebr.	Pierre, S. Dak.	Fort Pierre, S. Dak.	Bismarck- Mandan area, South Dakota
Residential.....	\$419,800	\$328,200	\$435,400	\$734,500	\$408,140
Business and industry.....	645,200	208,400	699,100	410,400	410,815
Municipal.....	114,300	381,800	91,300	50,000	-----
Flood fighting and rescue.....	-----	-----	-----	-----	-----
Transportation.....	-----	-----	-----	-----	12,800
Communications and utilities.....	-----	-----	-----	-----	16,230
<b>Total.....</b>	<b>1,179,300</b>	<b>1,418,400</b>	<b>1,225,800</b>	<b>1,194,900</b>	<b>847,985</b>

The foregoing data are sufficient to indicate in general terms the type of damage estimates made by the Corps of Engineers.

#### *Department of Agriculture estimates*

The United States Department of Agriculture also takes a hand in flood damage estimates. Its 1944 estimate indicated annual average flood damage of \$100 per square mile in a humid farm region with many rivulets, brooks, and creeks. It stated an opinion that there 75 percent of the damage occurs on farmland in headwater valleys due to frequent small floods. By making adjustments to 1953 dollar values, "Floods" computed a figure of \$240 million for agricultural damage alone on the 1.8 million square miles of farms; as compared with the Weather Bureau's adjusted average of \$225 million per year. Appendix D, page 69, reviews the Department of Agriculture methods of computing flood statistics.

These variances in statistics gathered by different Federal agencies indicate a lack of definitive flood damage figures but serve to indicate the order of magnitude of the flood damage problem.

#### *Civil Defense estimates of recent flood damage in the Northeast*

Coming to recent events, table 11 sets forth one set of preliminary estimates of flood damage to persons and property in 6 Northeastern States caused by heavy rains accompanying hurricane Diane in August 1955. These estimates were forwarded to the staff by the Federal Civil Defense Administrator, in his present capacity as

coordinator of Federal disaster relief. They were accompanied by the following note of caution:

Table 11 provides preliminary estimates of damage, as of October 1, 1955, in the Northeastern States resulting from Hurricane Diane August 1955, as reported by Federal and State agencies engaged in disaster relief operations.

These estimates are subject to revision as relief operations continue. While in general these revisions will probably reduce current estimates, in some particulars there may be increases. This is particularly true in case of figures for agricultural damage which are reported as being incomplete.

Damage estimates by county or community are available at the present time only on a fragmentary basis. It is anticipated that more accurate data will be available by the end of the year.

Table 11 presents information by States and by six classifications of property. It is noticeable that if these preliminary estimates prove accurate on final analysis, despite their magnitude, the actual property damage suffered falls short of earlier off-the-cuff estimates. No value is attempted to be ascribed to 180 deaths or 7,203 personal injuries or illnesses incurred as a result of the flood. The severity of the disaster is emphasized by the large number of personal injuries, illnesses, and deaths as well as by statistics indicating 21,658 homes damaged. Of these, almost 6 percent were destroyed and about 23 percent additional sustained major damage.

TABLE 11.—*Preliminary estimates of damage in Northeastern States resulting from floods caused by Hurricane Diane August 1955 by type of property and State*

Type of property	AMOUNT						
	[Thousands of dollars]						
	Total	Massachusetts	Rhode Island	Connecticut	New York	New Jersey	Pennsylvania
Commercial.....	\$67,522	\$5,410	\$2,200	\$42,601	\$1,033	\$2,678	\$13,600
Industrial.....	155,506	55,000	5,700	83,871	703	3,148	7,084
Utilities, railroad, and other public facilities.....	99,265	25,000	6,200	36,163	5,000	1,419	25,483
Residential.....	55,361	9,198	3,000	23,953	968	7,111	11,131
Highways and bridges.....	79,729	23,476	900	26,233	5,805	4,878	18,437
Agricultural.....	7,185	1,329	-----	2,424	2,200	150	1,082
Total.....	464,568	119,413	18,000	215,245	15,709	19,384	76,817

NUMBER							
Verified dead.....	180	12	1	75	1	0	91
Injured or ill.....	7,203	78	52	4,053	27	97	2,906
Hospitalized.....	321	17	2	204	4	18	76
Homes destroyed.....	1,229	91	2	774	29	81	262
Homes major damage.....	4,900	310	60	2,405	39	504	1,532
Homes minor damage.....	15,529	3,490	300	4,250	1,003	1,071	5,415

It bears notice that these statistics contain no estimate of damage done in other Eastern States such as South Carolina, North Carolina, and Virginia, parts of which were unwelcome host to three hurricanes, Connie, Diane, and Ione, in 1955. Again preliminary unofficial reports indicated heavy damage in shore areas of all three of these States, heaviest in North Carolina. This damage has presumably been included on a preliminary basis in the Weather Bureau's overall estimate of flood damage to the extent of slightly over \$1 billion to date in 1955.

Analysis of the preliminary Civil Defense figures indicates a six-State loss divided according to the following proportions among various types of property:

	Percent
Commercial.....	15
Industrial.....	33½
Utilities, railroads, etc.....	21
Residential.....	12
Highways and bridges.....	17
Agricultural.....	1 1¼
<b>Total.....</b>	<b>100</b>

† Noted as incomplete.

Largest losses in dollar value were suffered by industrial plants. These figures and their distribution should be kept in mind in deciding how much indemnity should be allowed per person or per property, assuming some indemnity program is adopted. No estimate of the number of industrial plants damaged is included. This information plus loss per plant would be essential to determine what proportion of the total loss could be reimbursed under a policy limited in amount by statute. In the case of residential property, the average damage works out to approximately \$2,556 per home; although for those totally destroyed the damage per unit would obviously be much higher.

*Corps of Engineers estimate of recent flood damage in the New England area*

At the request of the committee staff for estimates of damage caused by hurricane Diane, the Corps of Engineers, Department of the Army, has submitted the following tentative estimate of damages resulting from the August 18-19, 1955, storm in the New England area.

The storm of August 18-19 resulting from Hurricane Diane caused what appear to be unprecedented flood damages in New England.

It is not possible at this time to give anything approaching an exact estimate of these damages. The Corps of Engineers has started surveys of the damage but even initial returns for the areas of greatest destruction are not yet available. It is not yet possible to separate damage from flooding by rivers and damage resulting only from the torrential rain itself. Moreover, it is not yet possible to give even a rough idea of the full impact in terms of loss of industrial production, loss of employment, and transportation delays. Consequently in estimating damages at this time it has been necessary to rely heavily on State and local reports and estimates which in some cases under the stress of the situation may be exaggerated, and in other cases may be far too small due to the fact that certain important damage items may have been overlooked.

The following estimates of direct property damage only based on the foregoing considerations should be considered as tentative and preliminary, but indicative generally of the magnitude and distribution of the disaster:

*New England*

(a) By States:	<i>Million</i>
Connecticut.....	\$900
Massachusetts.....	400
Rhode Island.....	170
<b>Total.....</b>	<b>1, 470</b>
(b) By river basins:	
Housatonic.....	570
Connecticut.....	165
Thames.....	475
Blackstone.....	200
Charles-Neponset.....	10
Other small streams.....	50
<b>Total.....</b>	<b>1, 470</b>

(c) A large part of the damage was to industrial areas and to transportation facilities. Consequently it is probable that the losses of production and employment and business and transportation losses will substantially increase the figure given above.

The Corps of Engineers' tentative estimate of \$1,470 million total direct property damage in Connecticut, Massachusetts, and Rhode Island happens to be more than 4 times as large as the \$352,658,000 property damage for the same area estimated on a preliminary basis by the Federal Civil Defense Administration. In fairness to both agencies, they have stressed the preliminary nature and consequent unreliability of the statistics presented upon request from the committee staff. In his letter forwarding the material from the Corps of Engineers, Brig. Gen. E. C. Itschner stated:

The damage estimates are based almost entirely on State and local reports and are probably high. More precise and definite information on damages and frequencies will be developed in studies just now getting underway.

Either set of estimates serves, however, to emphasize the destructive effect of the August floods in the Northeastern States.

On the basis of estimates even more preliminary in nature, further substantial damage was wrought in the same general geographic area by the severe storm of October 1955.

#### CONTROL OF WEATHER CONDITIONS AND EFFECTS

It seems fair to state that, for all practical purposes, man has yet found no way to control the development or movement of severe storms. But he is still seeking ways to bring about such control.

Lacking ability to control storms, man's main effort is now devoted to finding means of minimizing their damaging effects. Toward this end, flood-control projects are undertaken to delay the passage of floodwaters downstream by constructing retaining reservoirs and to confine floodwaters near the usual channel by erecting dikes and levees. In addition, procedures are developed to predict or track the path of severe storms and provide suitable warnings as far in advance as possible in point of time. As in many other fields of endeavor, knowledge is power. The United States Weather Bureau is confident that, given adequate additional funds, personnel, and authority, it would be able to forecast the intensity and course of severe storms with more accuracy than is presently possible. Advance warning of the action of hurricane Connie in turning northeasterly after pursuing a general northerly course for hundreds of miles subsequent to crashing ashore in southeastern North Carolina in August 1955 could have helped minimize damage in the Northeastern States. More precise knowledge of the intensity of the extratropical cyclonic storm that dealt the Middle Atlantic and Northeastern States a severe blow in mid-October 1955 would have made it possible to take more adequate precautionary measures against flood damage. Ability to have predicted that hurricane Ione, which reached the east coast of the United States in September 1955, would again turn seaward at Norfolk, Va., and spare the more northerly coastal and inland areas a visitation, would have made possible forecasts avoiding worry to millions of residents of those areas and the expense involved in taking what proved to be unnecessary precautionary measures.

In recent years, the Congress has taken some steps to make possible more intensive research looking toward a solution of problems such

as these. However grudgingly, Nature yields her secrets to those who seek them with persistence. Man is learning to harness nuclear power. It is not without hope that he should approach the more prosaic task of learning more and more about the formation and course of severe weather conditions.

Indeed in isolated instances man has struck out into attempts at the control of weather conditions.

Promising results have met his efforts to prevent the development of hailstorms. Successful experiments have been conducted in seeding an incipient hailstorm prior to its buildup, leading to an earlier start and longer continuation of precipitation with a resultant lack of hail formation. Dependable culmination of these experiments would provide a means of reducing, if not preventing, hail damage to crops and property.

Promising results in this field of experimentation have led to discussion of the practicality of using similar methods to control the development and movement of hurricanes. The power of hurricanes still exceeds by far the localized power of nuclear bombs presently controlled by man. To date it has been impractical to seed a tropical storm with nucleating agents in order to force precipitation and prevent development of a storm having hurricane intensity. Moreover, although scientists theorize about the reasons why severe storms follow certain tracks, they presently have no means of directing the movement of a severe storm along any particular path.

Even the ability to decrease the intensity of a severe storm without completely preventing its development could minimize damage. A lowering of the volume of rain over a given area could well mean the difference between a deluge overtopping or bursting dikes or levees with resulting catastrophic damage and a heavy or light fall of rain contained within dikes or levees with no accompanying damage.

The Advisory Committee on Weather Control in the executive branch of the Federal Government has the functions of studying and evaluating experiments designed to modify the weather. The Advisory Committee does not presently conduct such experiments itself. As a corollary duty, the Advisory Committee studies the legal aspects of manmade modification of weather. In the latter field it considers such problems as proprietary rights in airborne moisture and legal liability for causing rain to fall at a spot different from that where it would have fallen had Nature been allowed to take her course. Solution of such problems could prove of value to the Federal Government if it were to act as insurer, in cases where it is subrogated to the rights of the insured against third parties upon payment of insurance benefits. Your committee staff has gained the impression, however, that at present the Advisory Committee would not feel justified in concluding that the results of weather-control experiments to date offer any practical methods of weather-damage avoidance to such an extent as to remove the need for considering the feasibility of a Federal program to aid in indemnifying the victims of weather damage. Nor do the accompanying legal problems seem to be settled to such a degree as to permit an exact forecast of the right of the Federal Government as an insurer-subrogee or its duties to others arising out of attempts to control weather conditions. Future activities of the Advisory Committee or groups engaged in similar activities deserve watching for such light as they may cast on the problems of weather control and accompanying legal liability.

## APPENDIX A

## GEOLOGICAL SURVEY DATA ON FLOOD FREQUENCY IN THE UNITED STATES

There is a general feeling expressed by representatives of the Geological Survey in the Department of Interior that it is possible to develop statistics on the frequency of occurrence of floods. The following material in the appendix has been furnished through the courtesy of Mr. Walter B. Langbein, hydraulic engineer, Geological Survey.

The Geological Survey is the principal agency for the collection of data on flow of water in rivers and canals. As of September 30, 1954, the Survey was maintaining about 6,754 stream-measurement stations<sup>1</sup> in cooperation with many Federal, State, and local agencies at which both stage and discharge were being determined and 335 stations on rivers, lakes, and reservoirs at which stage only was being observed. The records from all stations are published annually in the water-supply papers of the Survey. To facilitate publication of the annual series of reports, the area of the United States is divided into 14 parts whose boundaries coincide with certain natural drainage lines. Beginning with the reports for 1951, the records are published in 18 volumes, there being 2 volumes each for parts 1, 2, 3, and 6. The boundaries of the various parts are indicated by the following list.

Part 1. North Atlantic slope basins, in two volumes:

- A. North Atlantic slope basins, Maine to Connecticut.
- B. North Atlantic slope basins, New York to York River.

2. South Atlantic slope and eastern Gulf of Mexico basins, in two volumes:

- A. South Atlantic slope basins, James River to Savannah River.
- B. South Atlantic slope and eastern Gulf of Mexico basins, Ogeechee River to Pearl River.

3. Ohio River Basin, in two volumes:

- A. Ohio River Basin except Cumberland and Tennessee River Basins.
- B. Cumberland and Tennessee River Basins.

4. St. Lawrence River Basin.

5. Hudson Bay and upper Mississippi River Basins.

6. Missouri River Basin, in two volumes:

- A. Missouri River Basin above Sioux City, Iowa.
- B. Missouri River Basin below Sioux City, Iowa.

7. Lower Mississippi River Basin.

8. Western Gulf of Mexico basins.

9. Colorado River Basin.

10. The Great Basin.

11. Pacific slope basins in California.

12. Pacific slope basins in Washington and upper Columbia River Basin.

13. Snake River Basin.

14. Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the Geological Survey containing data on the water resources of the United States may be purchased or consulted as follows:

1. Copies may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, on application, furnish lists giving prices. A list of Geological Survey publications may also be obtained by applying to the Director, United States Geological Survey, Washington 25, D. C.

2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.

3. Sets are available for consultation in the offices of the Water Resources Division of the Geological Survey. Advance records can also be obtained at the offices of the Surface Water Branch of the Geological Survey.

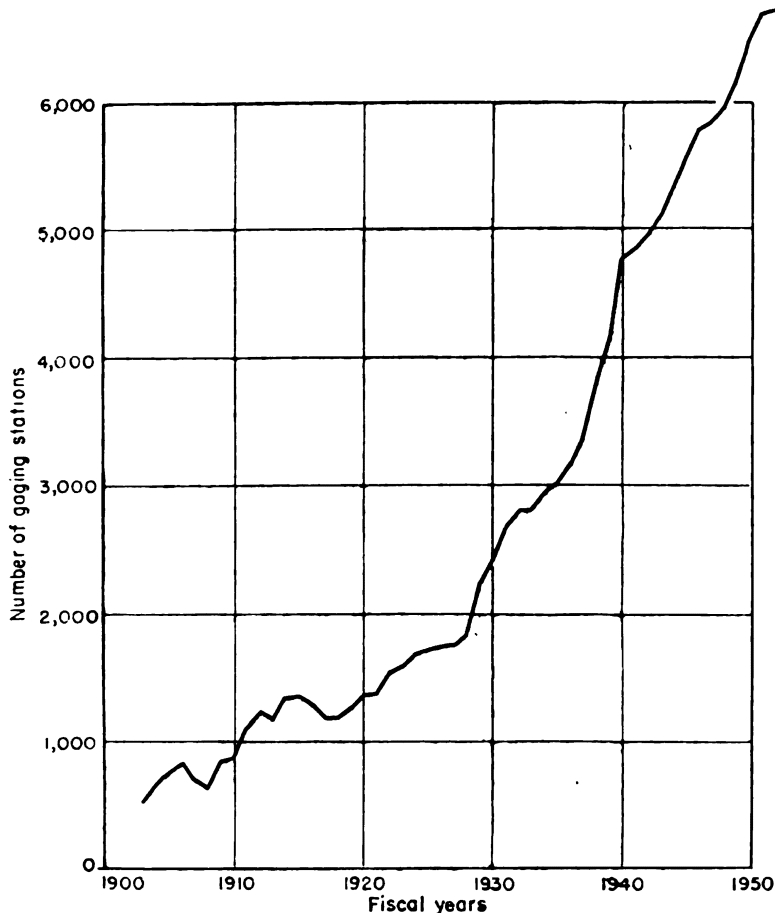
In the forepart of each of the water-supply papers for recent years is a table giving the reports that contain compilations of records of discharge for a period of years. Some of these reports cover single States, others cover single drainage basins. Stages and/or contents of many lakes and reservoirs are now published annually in water-supply papers of the Geological Survey.

<sup>1</sup> For list of gaging stations maintained by organizations other than the Geological Survey, the records of which are not generally published, see Inventory of Unpublished Hydrologic Data, U. S. Geological Survey Water-Supply Paper 837, pp. 56-67. The Survey's annual surface-water supply papers since 1935 contain lists of gaging stations for which records of discharge were collected during the year of the report by agencies other than the Geological Survey.

In collaboration with the water-resources division of the Canadian Government the Geological Survey issues monthly the Water Resources Review summarizing the water conditions throughout the United States and Canada. The review contains a map showing the state of current streamflow in relation to normal and delineates areas of normal, deficient, and excessive streamflow.

Figure 13 shows the number of gaging stations operated by the Geological Survey. The graph shows the number of stations in current operation as of any date. As of 1953 there were about 12,600 points at which some streamflow inflow had been obtained. Only about 1 out of every 2 stations that were ever started are now in operation. The fact that the records of many discontinued records cannot be related to any overlapping long-term records detracts from their general hydrologic value. Nevertheless, the figures of total points gaged are of considerable importance.

FIGURE 13. Gaging stations operated by Geological Survey.



#### LENGTHS OF RECORD

Table 12 gives a summary of the number of gaging stations operated for varying numbers of years as published in Surface Water Supply of the United States for water year 1952, by parts and for the United States as a whole. This tabulation thus applies to current records only. It applies also only to those stations on streams, excluding those on canals and other artificial water courses for which length of record is without hydrologic significance. Inasmuch as most hydrologic

computations hinge on length of record, this tabulation enables one to see at once the number of gaging stations with long records that are available. The table also shows the median length of record, which ranges from as low as 6.5 years in part 6A (upper Missouri Basin) where a great number of new records were established during the late 1940's under the Missouri Basin program, to 20 years in part 1A (New England). It should be noted that there are 60 active records with 50 years or more in length, with one or more in each part except part 13 (Snake River Basin).

TABLE 12.—Number of active discharge gaging stations classified as to period of operation, by parts, as of 1952

Years operated <sup>1</sup>	1A	1B	2A	2B	3A	3B	4	5	6A	6B	7	8	9	10	11	12	13	14	Total United States
0 to 5.....	17	99	35	59	42	21	72	61	132	122	72	63	106	63	86	69	25	48	1,192
6 to 10.....	16	73	32	50	63	40	78	34	104	58	69	37	84	37	45	59	40	31	950
11 to 15.....	61	109	51	106	154	23	36	58	43	50	125	77	60	26	80	34	20	46	1,159
16 to 20.....	19	34	17	30	34	40	21	28	33	40	48	32	50	14	22	17	19	34	532
21 to 25.....	47	64	63	36	63	19	29	13	30	61	36	25	29	15	90	41	26	28	715
26 to 30.....	16	34	24	9	37	18	25	9	6	21	17	36	20	9	38	14	25	32	390
31 to 40.....	32	51	4	9	48	27	26	21	7	26	26	30	29	27	54	17	33	26	493
41 to 50.....	14	12	1	2	6	2	8	6	2	10	4	10	21	7	23	14	11	9	162
51 to 60.....	2	6	3	2	1	6	2	1	0	5	0	5	2	0	6	1	---	1	42
61 to 70.....	2	1	---	---	0	1	---	0	1	1	1	1	1	1	---	---	---	0	13
71 to 80.....	1	---	---	---	1	1	---	1	---	---	---	---	---	---	---	---	---	1	5
81 to 90.....	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1
Total.....	228	483	230	303	449	198	297	232	358	302	398	316	402	199	444	267	199	256	5,652
Median (years)...	20	14	14	13	14	17	10	12	6.5	12	13	13	11	10	18	11	18	15	13

<sup>1</sup> Not necessarily continuous years of operation.

#### GAGING STATIONS BY RIVER BASIN MAPS

The number of river-gaging stations as of 1954 located in each of the areas covered by the 79 interagency series of 79 maps is given in the following table 13.

TABLE 13.—Number of gaging stations in basin-map areas

Map No.	Number of stations	Map No.	Number of stations	Map No.	Number of stations
1.....	53	29.....	21	57.....	50
2.....	214	30.....	68	58.....	38
3.....	137	31.....	71	59.....	27
4.....	247	32.....	52	60.....	52
5.....	177	33.....	78	61.....	63
6.....	98	34.....	104	62.....	19
7.....	81	35.....	75	63.....	135
8.....	46	36.....	29	64.....	104
9.....	61	37.....	30	65.....	123
10.....	101	38.....	38	66.....	23
11.....	40	39.....	43	67.....	21
12.....	81	40.....	67	68.....	50
13.....	90	41.....	70	69.....	23
14.....	45	42.....	33	70.....	47
15.....	62	43.....	95	70a.....	138
16.....	64	44.....	59	71.....	304
17.....	110	45.....	66	72.....	192
18.....	126	46.....	43	73.....	103
19.....	184	47.....	55	74.....	230
20.....	164	48.....	109	75.....	243
21.....	262	49.....	32	76.....	138
22.....	135	50.....	31	77.....	64
23.....	63	51.....	68	78.....	95
24.....	95	52.....	71	79.....	114
25.....	85	53.....	36		
26.....	67	54.....	32		
27.....	95	55.....	11		
28.....	41	56.....	46		
				Total.....	6,947

## GAGING STATIONS BY STATES

The number of gaging stations in each of the States is shown in table 14. A separate list is shown for stations on large streams, i. e., those on streams having drainage areas of over 1,000 square miles. The areal density of gaging stations is also shown. The areal density of all stations ranges from a maximum of 10.53 per 1,000 square miles in New Jersey to a minimum of 0.43 per 1,000 square miles in Nevada. The variation in numbers of stations among the States reflects to a high degree, the relative variation in such hydroeconomic factors as irrigation, flood damage, water power, municipal water supply, and waste disposal. The density of stations on large streams is much less variable, ranging between limits of 0.98 and 0.14 per 1,000 square miles of State area.

TABLE 14.—State areas and number of gaging stations

State	Land area (1,000 square miles)	Active discharge stations, March 1953		Stations with drainage area over 1,000 square miles	
		Total number	Density (stations per 1,000 square miles)	Total number	Density (stations per 1,000 square miles)
Alabama.....	51.1	94	1.84	29	0.57
Arizona.....	113.6	89	.78	45	.39
Arkansas.....	52.7	62	1.18	20	.38
California.....	156.8	489	3.12	50	.32
Colorado.....	104.0	299	2.88	52	.50
Connecticut.....	4.9	43	8.78	2	.41
Delaware.....	2.0	13	6.50	0	-----
Florida.....	54.3	134	2.47	50	.92
Georgia.....	58.5	96	1.64	35	.60
Idaho.....	82.8	192	2.32	50	.60
Illinois.....	55.9	160	2.86	40	.72
Indiana.....	36.2	113	3.12	30	.83
Iowa.....	56.0	82	1.46	35	.62
Kansas.....	82.1	99	1.21	60	.73
Kentucky.....	40.1	99	2.47	35	.87
Louisiana.....	45.2	74	1.64	25	.56
Maine.....	31.0	47	1.52	20	.64
Maryland.....	9.9	82	8.28	4	.40
Massachusetts.....	7.9	57	7.22	3	.38
Michigan.....	57.0	140	2.46	16	.28
Minnesota.....	80.0	121	1.51	45	.56
Mississippi.....	47.4	68	1.42	27	.57
Missouri.....	69.3	117	1.69	40	.58
Montana.....	146.3	221	1.51	55	.38
Nebraska.....	76.7	164	2.14	75	.98
Nevada.....	109.8	47	.43	15	.14
New Hampshire.....	9.0	49	5.44	6	.67
New Jersey.....	7.5	79	10.53	4	.53
New Mexico.....	121.6	148	1.22	52	.43
New York.....	47.9	207	4.32	25	.52
North Carolina.....	49.1	134	2.73	22	.45
North Dakota.....	70.1	69	.98	40	.57
Ohio.....	41.1	171	4.16	25	.61
Oklahoma.....	69.3	94	1.36	60	.87
Oregon.....	96.4	283	2.94	35	.36
Pennsylvania.....	45.0	108	3.73	36	.80
Rhode Island.....	1.1	10	9.09	0	-----
South Carolina.....	30.6	56	1.83	20	.65
South Dakota.....	76.6	82	1.07	36	.47
Tennessee.....	42.0	108	2.57	40	.96
Texas.....	263.6	233	.88	110	.47
Utah.....	82.3	237	2.88	30	.36
Vermont.....	9.3	36	3.87	3	.32
Virginia.....	39.9	188	4.71	30	.75
Washington.....	67.0	265	3.96	30	.45
West Virginia.....	24.1	90	3.73	23	.95
Wisconsin.....	54.7	92	1.68	30	.55
Wyoming.....	97.5	209	2.14	42	.43
Total for United States.....	2,977.1	6,210	(2.09)	1,557	(.52)

## CREST-STAGE AND SMALL-AREA GAGES

Crest-stage gages are installed to meet the need for additional flood-peak data. They are generally placed on small streams because of the paucity of regular gaging stations on small basins, although some crest-stage gages are

used to obtain data from larger drainage areas where there are regions not well defined by present gages. Generally, the gage consists of a length of 2-inch pipe with a wooden stick inside and with granulated cork placed in the bottom; water enters holes in the bottom fitting of the pipe and floats the cork, which adheres to the stick to mark the elevation of the peak stage. The site is rated by current-meter measurements or by indirect methods.

Crest-stage flood records are used for: (1) flood-frequency studies; (2) definition of stage-discharge relationships; and (3) design of culverts. An important element in bridge site analyses is a rating curve for the bridge site. Crest-stage gage records obtained at proposed future bridge sites are invaluable, as they assure a reliable rating. The definition of ratings at these nongaged sites probably is the most difficult part of our highway studies. Highway departments are greatly concerned with culverts, as 60 percent of the money spent on drainage structures goes for culverts (considered to be all structures having span lengths less than 20 feet); the routine gaging-station program has about 3 percent (229 out of 6,750) of all gages on streams of this size (estimated to be less than 10 square miles).

The number and distribution of gages of all types (including crest-stage gages) on drainage areas up to 50 square miles is shown in table 15.

TABLE 15.—Number of crest-stage gages and small area-gaging stations by States, to Aug. 31, 1953

State	Number of crest-stage gages	Number of gages on areas, in square miles, less than											Total under 50 <sup>1</sup>	Flood-frequency report <sup>2</sup>
		0.5	1.0	2.0	5.0	10	15	20	25	30	40	50		
Alabama.....	18			1	2	4	4	5	7	7	7	9	9	Published.
Arizona.....									1	1		2	2	
Arkansas.....											1	1	1	
California.....			2	6	21	31	45	54	65	83	98	102	102	
Colorado.....					1	7	16	29	36	48	63	78	81	
Connecticut.....													0	Do.
Delaware.....	5			1	1	4	4	4	5	5	5	7	16	
Florida.....	3				2	4	7	10	12	13	16	16	16	
Georgia.....	91						1	3	4	4	10	21	23	
Idaho.....					1	1	2	5	5	8	12	13	15	
Illinois.....				1	3	14	23	31	38	42	49	61	61	Do.
Indiana.....		1	1	2	3	4	4	4	5	5	6	6	6	
Iowa.....	72	1	3	9	14	17	22	22	24	26	31	33	46	Do.
Kansas.....						1	1	1	1	1	1	1	1	
Kentucky.....				1	5	8	8	11	13	14	16	20	20	
Louisiana.....	61			1	1	2	8	13	21	23	30	39	39	Do.
Maine.....													0	
Maryland.....	13	1	2	3	9	18	25	30	34	36	40	43	62	
Massachusetts.....				1	3	3	4	7	9	13	16	22	22	
Michigan.....	9			1	3	6	10	11	11	12	13	16	16	
Minnesota.....					3	3	4	4	4	4	5	5	5	Do.
Mississippi.....	76	2	2	2	2	4	4	5	6	6	6	6	30	
Missouri.....	5	2	6	9	17	20	21	21	23	23	23	23	23	Pending.
Montana.....					1	3	4	4	8	11	15	18	19	
Nebraska.....	93	1	8	13	26	45	53	60	69	75	83	84	84	Do.
Nevada.....							2	2	3	3	3	3	5	
New Hampshire.....							1	1	1	2	3	3	5	
New Jersey.....				1	6	10	12	15	17	23	27	31	31	
New Mexico.....	62	4	10	18	29	32	36	38	43	46	48	50	53	
New York.....		1	2	5	13	19	21	27	33	41	47	47	47	
North Carolina.....	103	1	20	29	44	65	81	91	101	106	115	129	130	
North Dakota.....											0	0	0	
Ohio.....	29	2	4	9	28	39	48	49	51	56	60	64	68	Published.
Oklahoma.....			1	3	7	11	14	14	16	16	18	20	20	
Oregon.....	48	5	12	20	34	50	57	65	72	76	87	95	99	
Pennsylvania.....					4	7	10	12	16	18	24	29	29	
Rhode Island.....					1	1	1	2	2	3	3	3	3	
South Carolina.....												3	3	
South Dakota.....													0	
Tennessee.....					3	4	7	7	8	8	9	9	9	
Texas.....			1	1	1	2	2	3	3	5	6	6	6	
Utah.....			1	2	6	10	14	15	18	19	23	24	24	
Vermont.....											1	2	2	
Virginia.....	36		4	5	17	35	50	55	60	63	68	74	74	
Washington.....	48	6	16	35	52	64	73	95	103	109	115	122	133	Do.
West Virginia.....										1	3	6	6	
Wisconsin.....					1	1	2	2	2	3	3	4	4	
Wyoming.....							2	4	7	13	15	18	18	
Total.....	772	26	90	170	328	526	676	811	933	1,034	1,197	1,347	1,473	

<sup>1</sup> Includes stations not included in preceding column for which drainage areas are not known, but are less than 50 square miles.

<sup>2</sup> As of December 1954.

## SUPPLEMENTAL SITES AT WHICH DISCHARGE MEASUREMENTS HAVE BEEN MADE

Results of discharge measurements made at over 9,000 supplemental sites have been published by the Geological Survey. Some of these sites later became sites of complete record stream-gaging stations, and some are on canals and ditches which have little or no hydrologic significance. However, most of these sites are on natural streams where discharge measurements could be correlated with the flow at nearby gaging stations were it not for the effect of runoff from local rainfall at the time of the measurement. Although some of these sites may be too far away from a complete record stream-gaging station to be correlated satisfactorily, it is probable that at over half of the sites listed, discharge measurements have been made under conditions that have hydrologic significance either from the standpoint of base flow or peak flow.

Measurements of peak discharge made by indirect methods after the flood at sites other than stream-gaging stations have been included in the list of miscellaneous measurements. The hydrologic value of these measurements lies in their use in defining an enveloping curve of the maximum experience.

During recent years many of these discharge measurements at miscellaneous sites have been made under base-flow conditions and therefore offer correlation possibilities. A quick way to determine whether a measurement was made during a base-flow period is to examine the discharge record at a stream-gaging station for the period of a week or 10 days before the day of the measurement for evidence of runoff from current rainfall. If the flow at these stations has been receding steadily for several days it may be assumed that discharge measurements made on nearby streams on that day represent base-flow conditions.

Results of these discharge measurements have been published in Geological Survey water supply papers in the series of annual reports on surface water supply of the United States under the heading "Miscellaneous Measurements." Actually these measurements are not miscellaneous but represent a valuable source of hydrologic data that is often overlooked, partly because there is no comprehensive alltime index. An index of the sites of miscellaneous measurements is being prepared in the Washington office of the Geological Survey and is available for reference. Also the district offices of the Surface Water Branch may be consulted as to discharge measurements at miscellaneous sites in their districts.

Attached table 16 is a breakdown of these sites by States and by part number corresponding to the part number of the series of annual reports on surface water supply in the United States. The period covered by this list is from 1908 to 1953 for parts 1-9 and 1936 to 1953 for parts 10-14. Indexing of earlier periods is in progress.

TABLE 16.—*Summary of miscellaneous sites*

State	Part number corresponding to surface water supply annual reports														Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Alabama.....		149	9												158
Arizona.....									160						160
Arkansas.....							19								19
California.....										7	148				155
Colorado.....						78	34	57	72						241
Connecticut.....	22														22
Delaware.....	2														2
Florida.....		324													324
Georgia.....		202	13												215
Idaho.....										28		8	176		212
Illinois.....			8	1	45										54
Indiana.....			72	41	25										138
Iowa.....					61	17									78
Kansas.....						20	8								28
Kentucky.....			30												30
Louisiana.....							34	7							41
Maine.....	30														30
Maryland and District of Columbia.....	64		2												66
Massachusetts.....	26														26
Michigan.....				216											216
Minnesota.....				14	137										151
Mississippi.....		59					27								86
Missouri.....					24	125	184								333
Montana.....					9	155						56	3		223
Nebraska.....						92									92
Nevada.....									21	9			21		51
New Hampshire.....	18														18
New Jersey.....	74														74
New Mexico.....							37	280	76						393
New York.....	98			6	46										150
North Carolina.....		91	71												162
North Dakota.....					14	12									26
Ohio.....			156	31											187
Oklahoma.....							82	300							442
Oregon.....										52	6		83	710	851
Pennsylvania.....	252		164	4											420
Rhode Island.....	1														1
South Carolina.....		59													59
South Dakota.....					2	46									48
Tennessee.....			294				31								325
Texas.....							35	490							525
Utah.....									220	58					278
Vermont.....	7			26											33
Virginia.....	91	192	83												366
Washington.....												1,020	9	195	1,224
West Virginia.....	7		131												138
Wisconsin.....				6	41										47
Wyoming.....						138			10	4					152
<b>Total.....</b>	<b>692</b>	<b>1,076</b>	<b>1,039</b>	<b>385</b>	<b>358</b>	<b>683</b>	<b>491</b>	<b>1,194</b>	<b>559</b>	<b>158</b>	<b>154</b>	<b>1,084</b>	<b>292</b>	<b>905</b>	<b>9,070</b>

NOTE.—For pts. 1-9, period 1908-53 is covered; for pts. 10-14, period 1936-53 is covered.

# APPENDIX B

TABLE 17.—*Loss of life and property in the United States from floods, by districts and years,<sup>1</sup> 1902-53*

District	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
	1902-3		1903-4		1904-5		1905-6		1906-7	
North Atlantic.....				\$4,350,000						\$1,000,000
South Atlantic.....	61	\$4,500,000								
Ohio Valley.....		176,000		75,000					7	8,903,000
Upper Mississippi.....	100	40,425,000		100,000	2	\$10,400,000	1	\$400,000		103,000
Lower Mississippi.....	1	500,000		20,000		100,000				500,000
Texas.....	16	5,015,000								
Pacific.....	(2)	2,500,000		2,000,000		500,000				5,010,000
Total.....	178	53,116,000		6,545,000	2	11,000,000	1	400,000	7	15,576,000
	1907-8		1908-9		1909-10		1910-11		1911-12	
North Atlantic.....				\$239,000		\$685,000				\$895,000
South Atlantic.....				3,188,000		364,000				69,500
East Gulf.....			5	1,509,000				\$3,500		1,604,000
Ohio Valley.....				390,000		1,335,000		5,710,000		3,514,000
Upper Mississippi.....				15,631,000		11,680,000		75,000		70,000,000
Lower Mississippi.....		<sup>3</sup> \$3,250,000		4,730,000		500,000		273,000		203,500
Arkansas.....				2,825,000		1,265,200				
Red.....				18,000,000						
Texas.....	11	5,000,000								
Pacific.....				2,622,000		5,410,000		1,711,000	2	1,300,000
Total.....	11	8,250,000	5	49,134,000		21,239,200		7,772,500	2	77,586,000

See footnotes at end of table, p. 61.

*Loss of life and property in the United States from floods by districts and years,<sup>1</sup> 1902-53—Continued*

District	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
	1912-13		1913-14		1914-15		1915-16		1916-17		1917-18	
Great Lakes.....							30	\$3,172,000				\$216,000
North Atlantic.....		\$1,303,500		\$87,000	4	\$16,100	4	1,200,000		\$372,125		968,000
South Atlantic.....		264,000		24,950	4	45,143			80	22,945,435		203,500
East Gulf.....		148,000		57,000		160,000						200,000
Ohio Valley.....	527	\$156,331,000		1,641,753		112,250		1,500,000		1,526,900		3,417,000
Upper Mississippi.....		550,000		162,700		9,018,500	36	4,435,641				800,000
Lower Mississippi.....		12,081,451		1,065,000		36,400		1,364,393		2,439,500		115,000
Arkansas.....				80,390		560,000		6,265,280				1,500,000
Red.....						1,540,000		633,000				21,000
Texas.....			180	11,058,915	41	2,317,607		413,132				157,500
Pacific.....		710,000		3,773,992		325,000				46,125		269,000
Miscellaneous east of Rockies.....							22	2,055,620				
Miscellaneous west of Rockies.....							26	5,084,934				
Total.....	527	171,387,951	180	17,951,700	49	14,131,000	118	26,124,000	80	27,330,085		7,867,000
	1918-19		1919-20		1920-21		1921-22		1922-23		1923-24	
Great Lakes.....		\$34,900		\$7,000								
North Atlantic.....		100,915		400,000		\$30,000		\$4,000,000	1	\$4,060,000	5	\$8,067,400
South Atlantic.....		666,390		4,178,715		150,000		75,000		32,690		3,465
East Gulf.....		169,730	20	5,000,000		1,310,000		35,000		410,600		59,650
Ohio Valley.....	2	593,525		3,000,000		150,000		4,800,000		74,300	11	3,408,970
Upper Mississippi.....		171,000	22	4,000,000				4,750,000	1	\$2,000,000	19	1,788,000
Lower Mississippi.....		50,000		3,000,000		\$445,000		8,085,750		290,000		
Arkansas.....		25,500		200,000	143	25,000,000		1,014,250	9	\$24,859,500	2	15,968,410
Red.....		155,000		1,800,000		100,000						158,400
Texas.....		875,000		2,810,500		530,000	215	27,000,000		204,000		192,500
Pacific.....		322,040		375,000		932,000		2,300,000		297,150		46,739
Miscellaneous east of Rockies.....									3	1,705,000		
Miscellaneous west of Rockies.....											9	120,000
Total.....	2	3,164,000	42	24,771,215	143	28,647,000	215	52,060,000	14	33,933,240	46	29,813,534

	July 1-Dec. 31, 1924		1925		1926		1927		1928	
Great Lakes.....	9	\$1,000,000				\$19,200	48	\$15,750,000		
North Atlantic.....		1,000,000		\$50,000		137,100	40	29,408,400	3	\$2,105,150
South Atlantic.....		562,510		2,999,178				1,000	5	8,382,538
East Gulf.....			2	615,025		37,170	8	254,700		2,428,500
Ohio Valley.....		8,000		53,000	2	5,628,677	94	15,639,620	4	10,279,150
Upper Mississippi.....		<sup>10</sup> 3,000,000	14	3,982,500	1	5,435,500		19,611,863		1,173,915
Lower Mississippi.....				115,000		42,000	100	133,898,468	2	7,820,000
Missouri <sup>11</sup> .....					6	1,434,252	1	4,879,750	2	6,714,960
Arkansas.....				223,400	6	8,938,050	132	26,183,350	1	4,349,000
Red.....					1	154,900		100,908,300		153,000
West Gulf <sup>12</sup> .....		<sup>13</sup> 500,000	6	1,435,650		301,000		208,500		75,000
Colorado <sup>14</sup> .....						447,000		11,800		100,000
Pacific.....		66,700	14	468,285				902,671		1,032,351
Miscellaneous east of Rockies.....						1,000,000				
Total.....	9	6,137,210	36	9,922,035	16	23,469,749	423	347,658,422	15	44,613,564
	1929		1930		1931		1932		1933	
Great Lakes.....		\$171,000		\$36,165		\$1,200		\$1,200		\$14,130
North Atlantic.....		245,000				1,050,000		25,035	2	5,418,653
South Atlantic.....	8	<sup>15</sup> 10,195,680				31,000		190,925		19,100
East Gulf.....	5	8,746,306		465,800		174,100		615,335		443,706
Ohio Valley.....	34	<sup>16</sup> 17,049,500		7,041,805		1,200		288,256	5	7,725,025
Upper Mississippi.....		3,677,500		15,150		20,000		88,050	4	1,156,740
Lower Mississippi.....	4	9,979,601		529,955				1,840,510		6,932,770
Missouri.....	13	2,118,250		13,500		886,200		451,155	2	1,391,200
Arkansas.....	12	7,516,465		213,100		6,800		2,528,125		776,100
Red.....	1	100,450	14	3,615,800		19,475		515,809		37,800
West Gulf.....		8,124,250		924,350		2,000	11	3,521,695		1,160,300
Colorado.....	12	175,000				3,000		12,550		
Pacific.....						560,000		216,590	20	11,603,950
Miscellaneous east of Rockies.....				2,500,000						
Miscellaneous west of Rockies.....				494,500		55,000				
Total.....	89	68,099,002	14	15,850,125		2,809,975	11	10,295,235	33	36,679,474

See footnotes at end of table, p. 61.

*Loss of life and property in the United States from floods by districts and years,<sup>1</sup> 1902-53—Continued*

District	Life	Property	Life	Property	Life	Property	Life	Property	Life	Property
	1934		1935		1936		1937		1938	
Great Lakes.....				\$13,185,000	1	\$8,500		\$690,500		\$239,950
North Atlantic.....		\$142,150	52	16,340,633	24	146,034,550		2,689,576	8	37,068,225
South Atlantic.....		240,450		76,880	2	2,390,925		989,715		454,800
East Gulf.....		12,525		719,675		1,240,495		357,580		1,654,877
Ohio.....	2	928,125	5	8,535,700	82	122,295,790	65	413,936,876	8	4,480,780
Upper Mississippi.....	12	1,022,850		1,505,745		313,400	3	1,127,205	2	3,659,300
Lower Mississippi.....			17	6,631,548		54,750	72	6,657,557		1,000
Missouri.....	6	1,905,890	125	38,959,091		109,400	2	1,367,960	71	4,333,135
Arkansas.....		17,750	4	8,344,515	6	816,950		1,557,950		2,202,606
Red.....	22	640,250	8	2,751,695		16,400		24,850		754,830
West Gulf.....		422,400	20	29,522,022	24	8,376,490		1,830,100	6	6,003,159
Colorado.....	1	21,500						264,385		256,733
Pacific.....	45	5,007,500	5	557,150	3	891,610		9,245,275	85	39,990,250
Total.....	88	10,361,360	236	127,129,624	142	282,549,260	142	440,739,529	180	101,099,645
	1939		1940		1941		1942		1943	
Great Lakes.....		\$11,100	2					\$153,075	1	\$9,564,253
North Atlantic.....	2	56,275	4	\$2,519,075			35	22,320,900	4	818
South Atlantic.....		454,340	12	5,033,925		\$88,850		607,960		152,274
East Gulf.....	1	6,679,900		5,496,483		23,850	2	155,350		773,390
Ohio.....	80	3,772,791	28	8,077,275		1,122,150	16	16,546,182	44	31,415,643
Upper Mississippi.....		227,750		199,315		3,018,180	1	5,592,056	16	42,097,371
Lower Mississippi.....		1,448,100	5		2			475,000		829,200
Missouri.....		609,375	5	1,758,850		12,018,755	1	22,510,940	13	62,630,405
Arkansas.....		179,350	2	1,332,000	9	13,346,100		6,576,405	26	41,850,342
Red.....		22,200		11,800		1,855,300		2,204,950		43,650
West Gulf.....		359,675	7	7,621,750	34	5,457,975	2	12,489,050		2,588,700
Colorado.....		12,950		180,000	2	1,061,030		2,850		310,000
Pacific.....				8,230,010		1,532,000	11	8,871,480	3	7,477,099
Total.....	83	13,833,806	60	40,460,483	47	39,524,690	68	98,506,198	107	199,733,145

	1944		1945		1946		1947		1948	
Great Lakes.....		\$129,900		\$118,800		\$250,600	1	\$5,761,400	4	\$20,269,800
North Atlantic.....			3	5,728,700	14	8,500,400		198,000	4	12,466,800
South Atlantic.....		1,928,500	3	1,006,800		172,300		944,200	1	1,372,200
East Gulf.....		2,680,200		2,687,500		2,962,800	2	654,100		3,121,800
Ohio.....		806,000	27	52,887,100		10,913,500	5	7,812,400	16	16,871,100
Upper Mississippi.....	7	27,030,800		9,288,400	4	8,642,300	27	87,936,900		2,904,800
Lower Mississippi.....		1,550,000		3,601,300		4,407,000	1	2,555,300		5,390,300
Missouri.....	13	44,615,700	4	34,402,500		8,305,200	18	163,176,800	1	31,489,300
Arkansas.....	10	11,171,100	20	15,067,700		1,791,500	1	1,423,500	14	18,721,000
Red.....		1,675,900	6	22,209,200		1,434,300		1,445,500		220,000
West Gulf.....	3	8,938,300	4	10,986,600	10	15,966,800		330,000	1	4,603,900
Colorado.....		575,000	10	181,500				3,000		1,100
Pacific.....			14	9,530,400		7,867,000		88,000	37	111,825,600
Great Basin.....				520,000		99,800				
Total.....	33	101,079,400	91	165,797,500	28	70,813,500	55	272,328,100	82	229,960,400
	1949		1950		1951		1952		1953	
Great Lakes.....		\$1,619,500	9	\$33,541,600		\$130,800		\$2,349,600	1	\$2,653,800
North Atlantic.....			2	7,149,300	1	916,300	5	1,221,700	1	10,637,000
South Atlantic.....	14	9,563,900		1,203,500		9,000		236,500		108,800
East Gulf.....		1,746,600		1,434,600		4,309,800		347,000	2	2,443,800
Ohio.....	7	4,754,500	50	25,195,200	1	4,889,300	14	4,939,900	5	777,700
Upper Mississippi.....		405,700	2	11,059,800	6	71,798,700	7	22,439,000	2	5,602,200
Lower Mississippi.....		10,020,200	6	10,071,200		5,995,500		444,500	12	7,857,000
Missouri.....	6	33,503,000	18	35,089,800	31	889,872,400	8	181,334,900	14	44,254,900
Arkansas.....		6,696,300		8,294,000	10	44,331,100		5,400	2	2,020,300
Red.....	2	364,800	1	1,105,000		2,101,400		835,600		2,060,500
West Gulf.....	18	22,462,000		416,700		238,500	10	9,584,500	1	34,848,500
Colorado.....		155,400				889,200		75,900		7,500
Pacific.....	1	2,640,000	5	37,361,800	2	3,259,500	10	20,251,400		8,931,400
Great Basin.....				4,126,600				9,998,500		
Total.....	48	93,931,900	93	176,049,100	51	1,028,741,500	54	254,064,400	40	122,203,400

<sup>1</sup> Fiscal years (July 1 to June 30) through June 30, 1924, and calendar years thereafter.

<sup>2</sup> Large number.

<sup>3</sup> Arkansas and Canadian Rivers.

<sup>4</sup> \$8,771,000 in States of Missouri and Kansas.

<sup>5</sup> \$3,420,000 in Oklahoma.

<sup>6</sup> \$115,150,715 loss and 467 deaths in State of Ohio.

<sup>7</sup> \$894,000 in Oklahoma.

<sup>8</sup> \$245,000 in Oklahoma.

<sup>9</sup> Incomplete.

<sup>10</sup> State of Illinois.

<sup>11</sup> Formerly included under Upper Mississippi.

<sup>12</sup> Substituted for Texas district as used previously.

<sup>13</sup> State of New Mexico.

<sup>14</sup> Formerly included under Pacific.

<sup>15</sup> Including damage from tropical disturbance during October.

## APPENDIX C

## FLOOD DAMAGES BY TYPES AND LOCATIONS

TABLE 18.—Flood damages by types and locations

Zone of location	Agricultural	Residential	Commercial	Industrial	Utilities	Public property	Transportation	Flood control	Public aid	Zone totals
Powder River.....	\$73,600						\$1,800	\$600		\$76,000
Innaha River.....	12,800						4,700			17,500
Salmon River.....	123,980	\$55,690	\$24,900	\$34,900	\$4,800	\$2,300	289,600	9,500		545,670
Grande Ronde River.....	834,000	9,400	9,400		12,000	9,400	42,960	138,000		1,055,160
Clearwater River.....	162,260	473,570	455,640	753,680	63,080	67,590	571,910	240,000		2,787,730
Snake River.....	286,640	3,770	16,090	44,430	500	4,600	105,320	121,000		582,350
John Day River.....	138,020						235,000			373,020
Columbia River:										
Zone 1.....	627,070	121,550	812,420	326,890	141,320	884,070	1,857,940	139,900	\$16,970	4,928,130
Zone 2.....	124,330	320,770	73,580	1,643,120	557,550	823,020	256,130	50,000	460	3,848,960
Zone 3.....	860,280	187,960	194,310	2,313,280	75,500	363,120	830,400	137,100	68,580	5,030,530
Zone 4.....	3,599,730	23,623,820	2,912,500	5,213,860	396,450	1,814,250	1,535,920	2,140,680	861,980	42,099,190
Zone 5.....	82,200	128,620	1,116,010	3,904,970	422,070	220,130	1,891,390		50	7,765,440
Zone 6.....	4,831,210	376,570	798,040	3,603,360	57,100	64,100	1,298,340	900,240	225,260	12,154,220
Zone 7.....	2,877,900	12,500	353,900	4,102,280	12,950	19,150	460,880	1,213,800	27,170	9,080,620
Subtotal, Columbia River.....	13,002,720	24,771,790	6,260,850	21,107,760	1,662,940	4,187,840	8,131,000	4,581,720	1,200,470	84,907,090
Subtotal, Columbia below Bonneville Dam.....	12,375,650	24,650,240	5,448,430	20,780,870	1,521,620	3,303,770	6,273,060	4,441,820	1,183,500	79,978,960
Type total.....	14,634,020	25,314,220	6,766,880	21,940,770	1,743,320	4,271,730	9,382,290	5,090,820	1,200,470	90,344,520

TABLE 19.—Agriculture damages and losses

Item	Land damage	Crops	Livestock	Improvement	Equipment	Irrigation and drainage	Increased cost of production	Other	Total
Powder River.....	\$1,600	\$65,000	0	\$1,500	0	\$800	\$3,200	\$1,500	\$73,600
Imnaha River.....	400	11,800	0	300	0	0	0	300	12,800
Salmon River.....	23,400	16,750	\$18,280	53,900	\$1,000	2,750	3,600	4,300	123,980
Grande Ronde River.....	84,250	543,640	101,480	23,520	25,340	8,650	24,660	22,460	834,000
Clearwater River.....	38,700	35,730	6,660	37,460	6,010	650	19,570	17,480	162,260
Snake River.....	35,640	115,990	2,390	26,520	1,500	71,000	17,240	16,360	286,640
John Day River.....	19,700	87,340	720	7,900	7,450	8,530	1,970	4,410	138,020
Columbia River: <sup>1</sup>									
Zone 1.....	50,710	420,200	2,190	110,360	37,290	4,500	1,080	740	627,070
Zone 2.....	8,850	90,210	4,720	14,050	3,100	800	1,850	750	124,330
Zone 3.....	162,200	417,540	103,330	105,230	22,600	4,580	30,500	14,300	860,280
Zone 4.....	30,190	1,921,280	121,530	980,080	260,140	17,590	149,620	119,300	3,599,730
Zone 5.....	0	82,200	0	0	0	0	0	0	82,200
Zone 6.....	271,850	3,085,880	301,500	514,900	161,630	23,500	212,130	259,820	4,831,210
Zone 7.....	46,850	1,853,480	247,320	390,820	118,950	41,880	136,440	42,160	2,877,900
Subtotal, Columbia River.....	570,650	7,870,790	780,590	2,115,440	603,710	92,850	531,620	437,070	13,002,720
Subtotal, Columbia below Bonneville Dam.....	519,940	7,450,590	778,400	2,005,080	566,420	88,350	530,540	436,330	12,375,650
Farm total.....	774,340	8,747,040	910,120	2,266,540	645,010	185,230	601,860	503,880	14,634,020

<sup>1</sup> From report on a survey sponsored by U. S. Department of Agriculture Councils of Washington, Oregon, Idaho, and Montana, by Carl G. Izett, Commodity Credit Cor-

poration, PMA, U. S. Department of Agriculture county estimates adjusted to Portland district, Corps of Engineers, Columbia River zoning.

TABLE 20.—*Residential damages and losses (main stem Columbia River)*

Zone	Direct damages								Indirect losses					Total damages
	Grounds	Buildings and improvements	Interior furnishings	Equipment	Supplies	Cleanup	Other direct	Total direct	Property use	Interruption of normal business	Wages and other income	Other losses	Total indirect	
Zone 1.....	\$11,050	\$55,130	\$10,160	\$2,330	\$4,560	\$2,810	\$28,510	\$114,550	-----	\$2,300	\$1,200	\$3,500	\$7,000	\$121,550
Zone 2.....	50,080	209,860	19,400	5,400	330	29,740	-----	314,810	\$1,770	40	460	3,690	5,960	320,770
Zone 3.....	21,320	95,470	11,900	3,180	3,810	18,410	12,800	166,890	10,570	1,000	4,500	5,000	21,070	187,960
Zone 4.....	246,770	16,420,100	64,150	30,600	6,504,560	276,900	-----	23,543,080	78,990	350	1,400	-----	80,740	23,623,820
Zone 5.....	35,770	65,650	3,400	1,570	3,250	12,920	-----	122,560	3,110	2,950	-----	-----	6,060	128,620
Zone 6.....	37,170	112,410	15,780	6,780	11,760	33,910	19,030	236,840	81,370	1,200	11,000	46,160	139,730	376,570
Zone 7.....	1,850	5,550	650	-----	750	1,920	-----	10,670	530	500	800	-----	1,830	12,500
Total.....	404,010	16,964,120	125,440	49,860	6,529,020	376,610	60,340	24,509,400	176,340	8,340	19,360	58,350	262,390	24,771,790

TABLE 21.—Commercial damages and losses (main stem Columbia River)

	Direct damages								Indirect losses									Total damages
	Grounds	Buildings and improvements	Interior furnishings	Equipment	Supplies	Clean-up	Other direct	Total direct	Property use	Interruption of normal business	Wages	Other income	Interruption of—		Depreciation of property value	Other losses	Total indirect	
													Utilities	Transportation				
Zone 1..	\$20,730	\$122,700	\$22,850	\$12,800	\$158,010	\$13,700	\$22,480	\$378,270	-----	\$340,470	\$19,880	\$25,000	\$2,000	\$20,000	\$100	\$31,700	\$439,150	\$812,420
Zone 2..	2,350	11,900	350	50	1,140	4,910	-----	20,700	-----	45,980	6,500	100	100	200	-----	900	52,880	73,580
Zone 3..	2,120	24,660	1,060	17,500	18,240	11,360	4,810	79,750	\$3,370	86,380	20,150	2,600	-----	660	500	-----	114,560	194,310
Zone 4..	257,050	950,600	55,700	128,940	441,650	104,050	47,130	1,985,120	17,200	715,950	187,430	10	4,440	-----	2,350	-----	927,380	2,912,500
Zone 5..	7,680	244,220	-----	55,050	90,140	122,280	22,410	541,780	13,550	374,270	63,320	500	-----	107,590	15,000	-----	574,230	1,116,010
Zone 6..	19,050	104,000	12,460	33,200	68,430	29,120	11,480	277,740	12,930	396,850	59,790	4,150	750	1,900	19,500	24,430	520,300	798,040
Zone 7..	1,050	89,800	150	10,420	35,200	38,770	-----	175,390	1,100	101,200	58,800	17,000	500	-----	-----	-----	178,600	353,990
Total..	310,030	1,547,880	92,570	257,960	812,810	324,190	108,310	3,453,750	48,150	2,061,100	415,870	49,360	7,790	130,350	20,100	74,380	2,807,100	6,260,850

TABLE 22.—Industrial damages and losses (main stem Columbia River)

	Direct damages								Indirect losses									Total damages
	Grounds	Buildings and improvements	Interior furnishings	Equipment	Supplies	Clean-up	Other direct	Total direct	Property use	Interruption of normal business	Wages	Other income	Interruption of—		Depreciation of property values	Other losses	Total indirect	
													Utilities	Transportation				
Zone 1 ..	\$3,500	\$32,520	-----	\$17,000	\$14,500	\$2,520	\$29,100	\$99,140	-----	\$105,800	\$103,300	-----	-----	-----	-----	\$18,650	\$227,750	\$326,890
Zone 2 ..	32,200	1,000	\$10,100	92,350	182,400	108,800	33,000	459,850	-----	926,000	235,620	-----	-----	-----	\$1,650	20,000	1,183,270	1,643,120
Zone 3 ..	24,990	76,540	13,610	154,900	284,720	122,820	2,200	679,780	\$134,000	640,460	606,400	\$29,800	\$27,000	-----	840	195,000	1,633,500	2,313,280
Zone 4 ..	36,140	321,480	15,010	149,940	875,950	474,440	509,930	2,382,890	150,000	1,080,700	550,270	1,030,000	-----	-----	20,000	-----	2,830,970	5,213,860
Zone 5 ..	46,170	578,300	800	250,850	175,800	328,070	96,930	1,476,920	12,000	1,378,500	926,300	15,250	-----	\$96,000	-----	-----	2,428,050	3,904,970
Zone 6 ..	44,320	141,650	5,500	40,140	47,040	15,900	42,470	337,020	-----	2,364,110	837,710	63,040	-----	650	530	300	3,266,340	3,603,360
Zone 7 ..	6,250	236,000	90	103,470	150,700	138,360	15,200	650,070	10,500	2,485,750	487,860	126,000	-----	-----	306,000	36,100	3,452,210	4,102,280
Total.	193,570	1,387,490	45,110	808,650	1,731,110	1,190,910	728,830	6,085,670	306,500	8,981,320	3,747,460	1,264,090	27,000	96,650	329,020	270,050	15,022,090	21,107,760

TABLE 23.—*Utility damages and losses (main stem Columbia River)*

	Direct damages					Indirect losses			Total damages
	Grounds, buildings, and improvements	Equipment and supplies	Cleanup	Other direct	Total direct	Interruption of normal business	Other losses	Total indirect	
Zone 1.....	\$74,800	\$7,730	\$8,800	\$31,520	\$122,850	\$16,870	\$1,600	\$18,470	\$141,820
Zone 2.....	56,680	3,050	3,720	-----	63,450	471,300	22,800	494,100	557,550
Zone 3.....	50,000	24,900	-----	-----	74,900	600	-----	600	75,500
Zone 4.....	172,000	104,540	-----	10,910	287,450	109,000	-----	109,000	396,450
Zone 5.....	133,850	17,700	18,400	141,200	311,150	62,820	48,100	110,920	422,070
Zone 6.....	650	26,650	18,750	8,500	54,550	2,300	250	2,550	57,100
Zone 7.....	1,000	4,650	500	350	6,500	6,250	200	6,450	12,950
Total....	488,980	189,220	50,170	192,480	920,850	669,140	72,950	742,090	1,662,940

TABLE 24.—*Public property damages and losses (main stem Columbia River)*

	Direct damages					Indirect losses	Total damages
	Grounds, buildings, and improvements	Equipment and supplies	Cleanup	Other	Total direct		
Zone 1.....	-----	-----	-----	\$847,880	\$847,880	-----	-----
Zone 2.....	\$21,100	\$300,000	-----	-----	321,100	\$36,190	\$884,070
Zone 3.....	8,000	282,550	\$49,020	2,750	342,320	501,920	823,020
Zone 4.....	84,450	1,638,950	40,250	4,500	1,768,150	20,800	363,120
Zone 5.....	112,150	5,100	44,630	550	162,430	46,100	1,814,250
Zone 6.....	34,470	4,850	9,840	5,840	55,000	57,700	220,130
Zone 7.....	1,100	-----	1,500	16,550	19,150	9,100	64,100
Total.....	261,270	2,231,450	145,240	878,070	3,516,030	671,810	4,187,840

TABLE 25.—*Transportation damages and losses (main stem Columbia River)*

	Air service		Navigation		Highways and roads		Railway systems		Zone totals		Total damages
	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect	Direct	Indirect	
Zone 1.....			\$212,840	\$140,700	\$329,400	\$366,000	\$240,000	\$69,000	\$782,240	\$1,075,700	\$1,857,940
Zone 2.....			52,090	27,300	14,340	91,400	55,000	16,000	121,430	134,700	256,130
Zone 3.....	\$1,000	\$5,400	145,120	53,800	217,330	365,000	35,750	7,000	399,200	431,200	830,400
Zone 4.....	127,630	166,960	81,130	7,200	459,350	366,150	253,000	74,500	921,110	614,810	1,535,920
Zone 5.....			331,510	507,300	181,900	255,050	400,110	215,520	913,520	977,870	1,891,390
Zone 6.....			341,910	201,950	387,200	161,050	104,500	101,700	833,610	464,730	1,298,340
Zone 7.....			214,620	16,300	59,840	62,110	85,010	23,000	359,470	101,410	460,880
Total.....	128,630	172,360	1,379,220	954,580	1,649,360	2,166,760	1,173,370	506,720	4,330,580	3,800,420	8,131,000
Type total.....	300,990		2,333,800		3,816,120		1,680,090		8,131,000		8,131,000

## APPENDIX D

## FLOOD DAMAGE STATISTICS OF THE DEPARTMENT OF AGRICULTURE

Erwin C. Ford, of the Department of Agriculture, in an article prepared for the Journal of Soil and Water Conservation, notes that less spectacular than the great river floods are the many floods that occur year after year within the tributary headwaters of our major rivers but they cause much larger total damage. These floods in the aggregate cause an average annual damage of approximately \$545 million according to preliminary estimates based on a study of some 77 watersheds. These watersheds cover an area of approximately 52 percent of the continental United States (table 26). In the areas affected these floods mean damaged, destroyed, or washed-out crops, damaged homes, eroded lands, and frequently the loss of a lifetime of work. Thus, a relatively high percentage of all floodwater damage is caused by floods on headwater streams.

These floods on creeks and small tributary streams are usually caused by short intensive storms which cover relatively small areas. Such floods occur far oftener than the storms of longer duration over large areas which are required to produce a main-stem flood. A high proportion of headwater flood damages are occasioned by floods that occur more frequently than once in 10 years. Because of the thousands of headwater streams which drain our vast agricultural regions it can be seen that the damage caused each year by many frequent floods will build up to a staggering total.

## ANNUAL FLOOD DAMAGES

In the headwater valleys a major part of the average annual flood losses are predominantly agricultural. Percentage-wise, the figure will approximate 70 percent of the total average annual damage (table 26). This loss includes crops and pasture and other agricultural items, such as damage to fences, roads, buildings, stored crops, and livestock. Land damage in the form of floodplain scour, stream-bank erosion, gully and valley trenching though not so important monetary-wise as the types of damage described above, is quite important from the standpoint of our agricultural resources. Some 5 percent or more of our total agricultural land lies in the alluvial flood plains of tributary valleys. This land on the average is the most productive that we have. If given flood protection of a reasonable degree it will remain productive for a long time to come. Some land damage is somewhat temporary in nature in that full productivity can be restored within a relatively few years.

In other cases the damage is more or less permanent and productivity is impaired for future generations. It therefore seems highly important that protection from land damage should be one of the first essentials in our attack on the flood-damage problem.

For the Nation as a whole, preliminary estimates indicate that the average annual upstream floodwater damages to nonagricultural property amounts to roughly \$118 million. These consist of damages to transportation facilities, industrial, commercial, and other urban property.

TABLE 26.—*Estimated average annual upstream floodwater damage in the United States, by types*<sup>1</sup>

Type of damage	Dollars <sup>2</sup>	Percent of total
Crops and pasture.....	\$239, 180, 000	43. 9
Other agricultural.....	84, 875, 000	15. 6
Land damage.....	36, 590, 000	6. 7
<b>Total agricultural.....</b>	<b>360, 645, 000</b>	<b>66. 2</b>
Transportation facilities.....	50, 675, 000	9. 3
Urban property.....	40, 596, 000	7. 4
Industrial, commercial, and other.....	27, 176, 000	5. 0
<b>Total nonagricultural.....</b>	<b>118, 147, 000</b>	<b>21. 7</b>
<b>Indirect.....</b>	<b>66, 030, 000</b>	<b>12. 1</b>
<b>Grand total.....</b>	<b>545, 122, 000</b>	<b>-----</b>

<sup>1</sup> Based on prices for the year ending July 31, 1952.

<sup>2</sup> Preliminary.

In addition to the damages enumerated in table 26, it is estimated that some \$66 million worth of indirect damages occur annually. These result both from the direct agricultural and nonagricultural damages. In general they represent loss of income in the processing of agricultural products, loss of trade from areas that suffer damage, delays in transportation, and many other forms of indirect monetary loss.

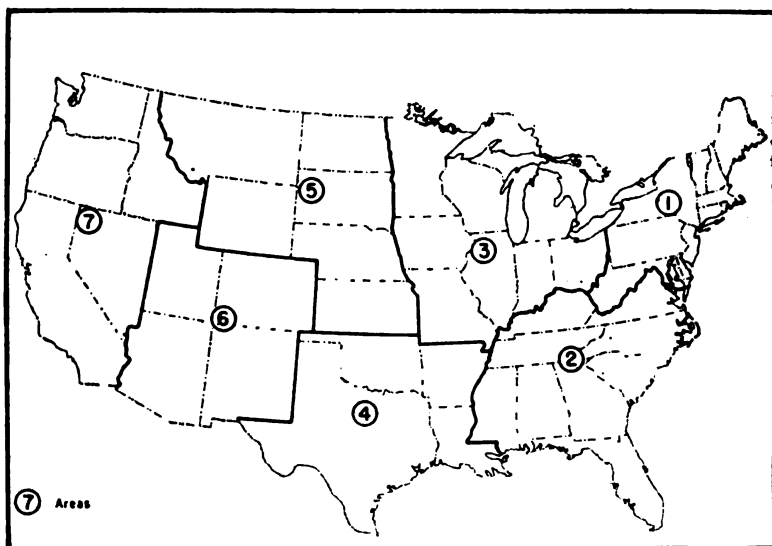
It is estimated that the average annual flood damage in the major river valleys is about \$500 million. These damages, unlike those occurring in the headwaters of streams, are predominantly nonagricultural. This is significant because it again points up the fact that floods and their damaging effects concern all the people, whether they are urban or rural residents.

On the basis of these estimates, the total average annual floodwater and sediment damage in the United States approximates \$1.2 billion. Of this total about \$677 million, or 56 percent, is upstream headwater damage and \$528 million, or 44 percent, downstream major river damage. Thus, a comparison of the headwater damages with downstream damages indicates two major flood problems: the problem of reducing headwater damage and the problem of providing protection to the heavy concentration of wealth and population in the great river valleys. In both cases the highest possible degree of protection from floods should be given so long as such protection is economically justified.

#### BASIS FOR FLOOD-DAMAGE ESTIMATES

In estimating upstream floodwater damages, the Nation was divided into seven geographic areas (fig. 14) and estimates were made of the total upstream floodwater damage in each of these areas. The estimates were developed from intensive studies of actual flood occurrences, flood magnitudes and frequencies on sample watersheds located in many sections of the United States. Floodwater and sediment-damage data from these sample studies were expanded to areas of similar physical and economic characteristics, in order to arrive at areawide totals. In some cases, the expansion could be made directly on an aerial basis, in others this was not possible, and in those instances other expansion techniques were employed in making the estimates.

FIGURE 14.—FLOOD DAMAGE GEOGRAPHIC AREAS



In areas 1 and 7, nonagricultural damages exceed agricultural damages. In area 1, the nonagricultural damage will approach three times that to agriculture; and in area 7, about  $1\frac{1}{2}$  times. The same situation does not obtain, however, for the other areas. In almost every case total agricultural damage will exceed the non-agricultural damage by a substantial margin. This is especially true in areas 2,

3, 4, and 5. In most of the geographic areas the damage to crops and pastures exceeds any other single type of damage by a considerable margin. Other agricultural damage usually ranks second in importance. For the Nation as a whole, transportation-facility damage ranks third. The reason for this relatively high figure appears to be the unusually heavy damage which is often occasioned to roads, highways, railroads, bridges, pipelines, telephone and telegraph lines. In some geographic areas figures were not available to allow making a breakdown of nonagricultural damage for such items as industrial, commercial, and other. Usually these were included as a lump sum under "urban property damage."

#### SEDIMENT DAMAGES SIGNIFICANT

The damages shown in table 27 are water damages only. It is virtually impossible, however, to separate purely water damage from that caused by a combination of water and sediment. Sediment frequently occurs in floodwaters and it, too, contributes to the damaging effect. This can easily be illustrated by visualizing what would happen if a flood should cover a crop of wheat in the preharvest stage. Even a brief covering of the crop by the floodwaters at this stage of growth is sufficient to leave a fine coating of sediment over the entire head of the plant. This coating seems to have the effect of stopping further growth of the plant and, of course, prevents maturity of the crop. This type of damage is called floodwater and sediment damage, largely because the two are inseparable.

TABLE 27.—Average annual upstream floodwater damages, in dollars, by geographic areas

Geographic area	Total	Geographic area	Total
1.....	\$37,626,000	6.....	\$10,135,000
2.....	157,575,000	7.....	30,412,000
3.....	102,385,000		
4.....	97,200,000	Total, United States.....	545,122,000
5.....	109,789,000		

Certain types of sedimentation, however, may be clearly separated from strictly floodwater damage. These are often described in the following broad groups: (1) infertile overwash, (2) swamping, (3) filling of reservoirs, (4) damage to water-filtration facilities, (5) damage to transportation facilities, and (6) damage to drainage and irrigation facilities. Tentative estimates of this type of damage for the United States as a whole based on 1952 prices approximate \$160 million annually.

Sedimentation damage seems to occur most often in the cultivated farmland areas of the country, especially in geographic areas 2, 3, 4, and 5. Areas under cultivation are usually more subject than others to washing and to other forces of erosion. Erosion contributes a large load of sediment to the headwater tributaries and consequently to downstream and mainstream areas. Such sediment fills channels, is deposited on the highly productive floodplains, and is carried into major reservoirs.

In those areas where upland erosion is progressing at a rapid rate, serious damage often results from the deposition of this eroded material on the floodplain lands. After erosion has progressed to a certain point the material eroded from the uplands consists largely of sterile soil particles. Such deposits tend to make the bottom lands less productive and in some cases made the land practically worthless.

As later floods occur, the waters have a tendency to pick up and transport sediment farther downstream into major reservoirs, water filtration systems of cities, drainage and irrigation ditches, and on to transportation facilities. Deposition of silt in ponds and reservoirs is extremely serious in many parts of the country, especially where rapid filling of the ponding area takes place. The life of water supply, power, flood control, and other types of reservoirs is often drastically shortened by this filling.

Since damages from sedimentation, as described above, tend to be cumulative, anything that can be done to reduce the sediment content in floodwaters is extremely important. Thus sediment that is brought down from the top of the hills into the little waters and the major river valleys will tend to produce damage in future years through decreasing the channel capacities, gradual destruction of the productive bottom land, and swamping of the bottom land and consequent raising of groundwater levels.

Another aspect of sediment damage is that done to navigation channels, especially to navigable rivers and harbors. Each year millions of dollars are spent in the United States in cleaning and dredging out such channels. Most of this sediment is caused by erosion on the uplands.

Flooding of residential property and other types of sediment damage quite often occur, especially in urban areas. Sediment deposits of several inches, which have often been encountered in cleanups after major floods, are costly to urban residents.

Under the 1936 Flood Control Act the Corps of Engineers was assigned the responsibility for investigations and improvement of rivers and other waterways for flood control and allied purposes. The Department of Agriculture was given the responsibility for investigations and improvement of watersheds for runoff and waterflow retardation and soil erosion prevention. Thus, there are two inter-related and coordinated parts to the total flood prevention and control job that needs to be done in this country. To fully carry out this job both upstream and downstream programs must be worked out in close coordination with each other if the best overall program is to be designed and installed for the protection, conservation, and development of our land and water resources.

In working out this complicated problem it is essential that Federal agencies should present to the local people and other interested groups all of the facts that are available. Such information will enable the people living within a basin to make the correct decisions after studying the facts and to participate in determining the best possible corrective program in the interest of the local people concerned and the Nation.

#### MORE EMPHASIS ON WATERSHEDS NEEDED

Since about 56 percent of the current average annual floodwater and sediment damage occurs in the valleys of headwater streams and since a large part of this damage is agricultural and primarily affects agricultural interests, it appears that additional emphasis should be given to upstream floodwater and sediment damage prevention.

Recent Federal appropriations have provided about \$63 for flood control on main streams to every \$1 for watershed flood prevention. There is urgent need for better flood damage prevention in headwater areas through a functionally interrelated threefold program, each part given proper weight in terms of public assistance and coordinated with the others to the fullest degree possible. These are:

(1) *Land treatment.*—Land treatment includes such measures as contour cultivation, terracing, improved rotations, cover crops, improved range management, woodland management, and many others. Such measures, in proper combination, help prevent erosion, maintain soil fertility, conserve water by storing it in the soil, prevent damage on the farm from the erosive action of rainfall and runoff, and reduce the sediment loads of creeks and rivers. Land treatment measures are already being rapidly installed by landowners under the programs of the locally organized soil conservation districts, aided by technical assistance from the Soil Conservation Service as well as by educational assistance and direct financial aids from others. The rate of application needs to be stepped up, however, to achieve more rapid protection of watershed areas.

(2) *Upstream waterflow retardation and channel stabilization.*—This phase of watershed improvement, involving work on the tributaries and smaller waterways to control or retard runoff from neighboring farms includes measures such as small retarding structures, gully stabilization works and channel improvements, which are installed largely by contract, to alleviate damage to the agriculture and to rural improvements of the smaller watersheds above the downstream engineering works. These measures retard runoff and stabilize sources of sediment in upstream channels. They represent water-control operations over and above what is ordinarily done through the farmland conservation job. This type of work is carried out in a few watersheds by the Department of Agriculture, assisting local agencies and individuals.

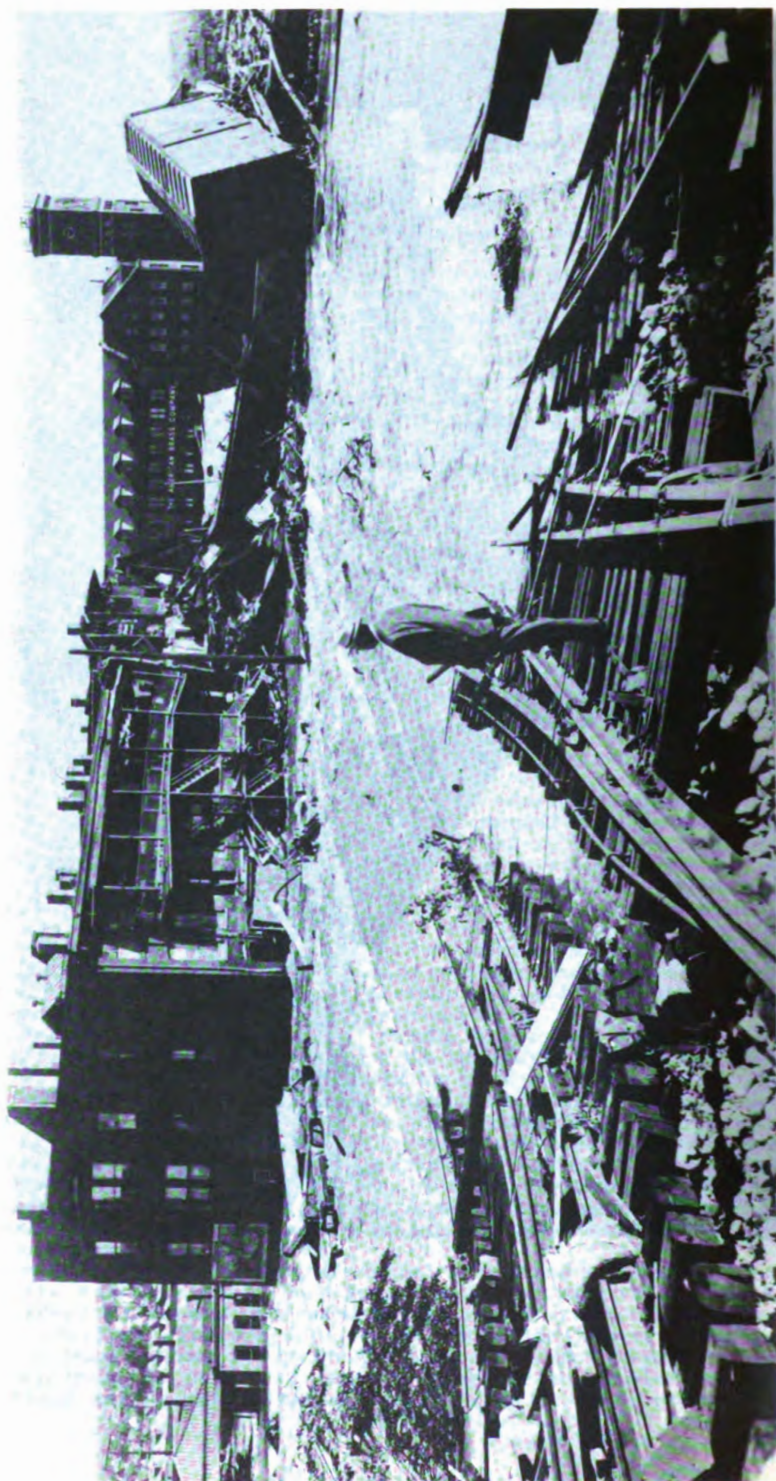
(3) *Downstream flood-control measures.*—Large reservoirs and levees constructed on the major waterways control flood flows in the major river valleys. Such measures alleviate urban and agricultural damages caused by major floods lower down the main rivers. This work is the responsibility of the Corps of Engineers.

This three-phase program is a coordinated approach to flood prevention and control—a program that protects the farmer or rancher of the uplands as well as of the lowlands, and the upstream bottom lands as well as the downstream cities.



Wide World photo

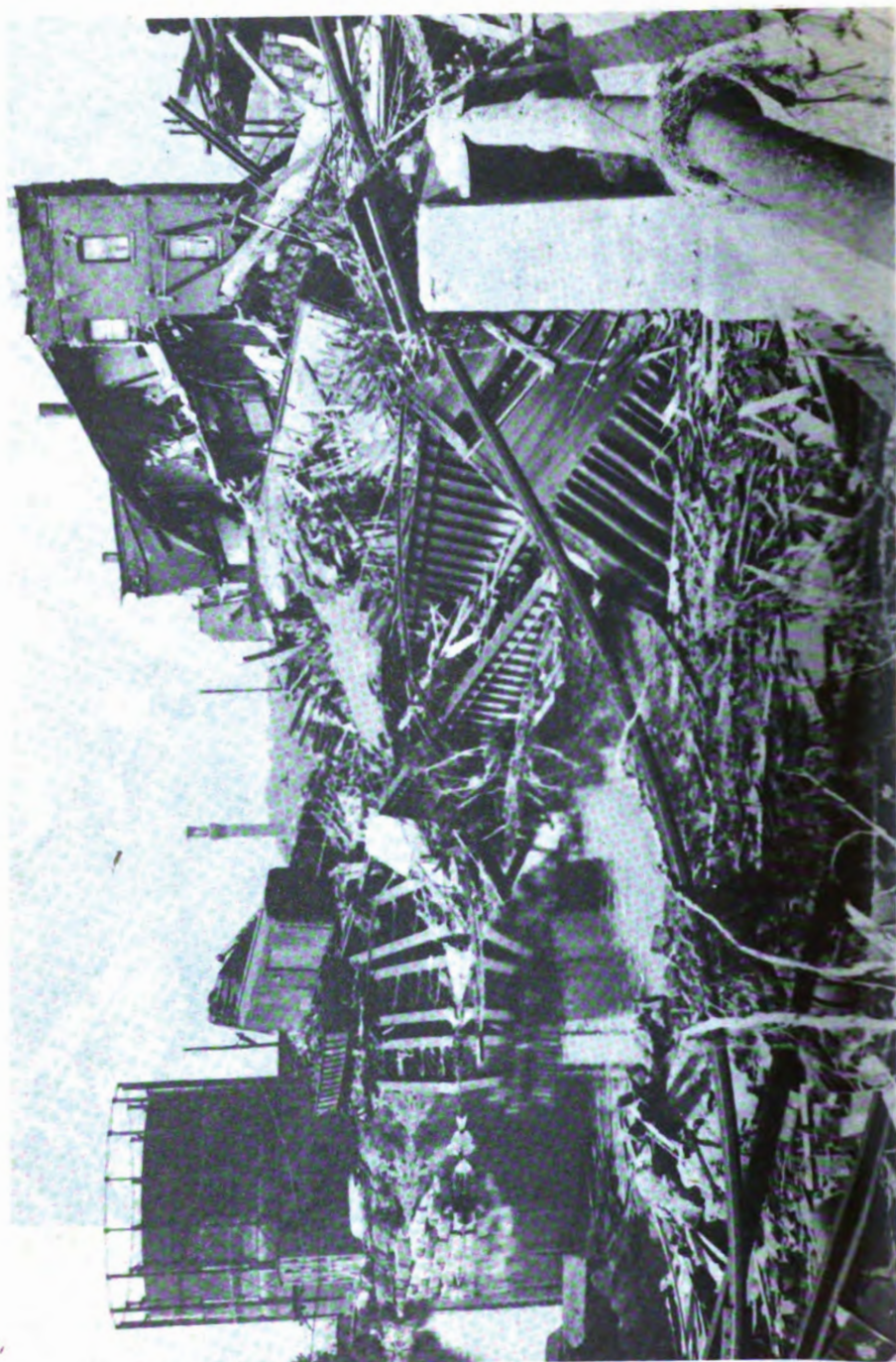
**FLOOD.**—Street intersection in Waterbury, Conn., on August 21, 1955, just after the flood had receded.





Hartford Courant  
photo

Flood.—Waterbury, Conn.



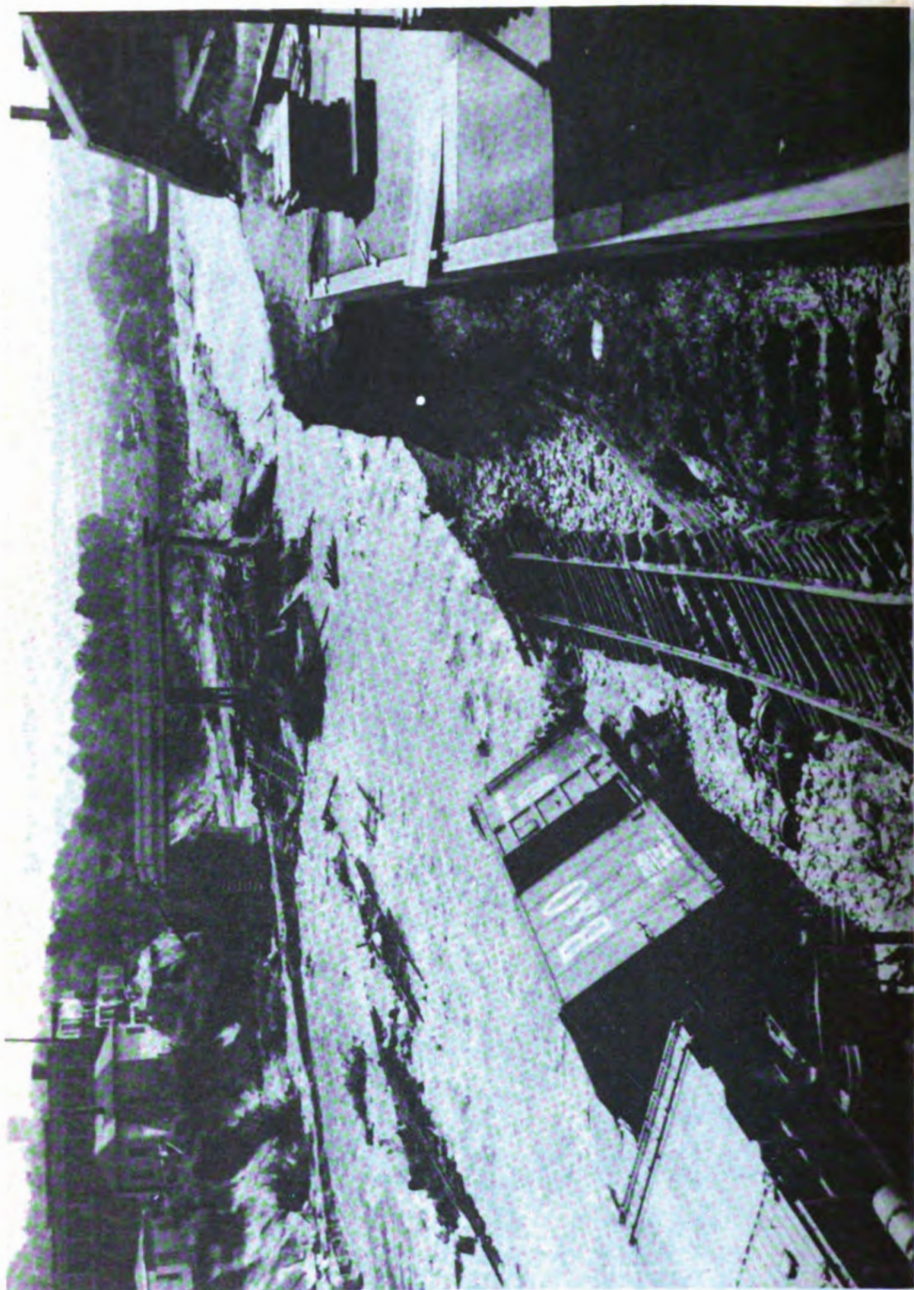


Flood.—Bank Street, Waterbury, Conn.





Flood.—Ansonia, Conn.

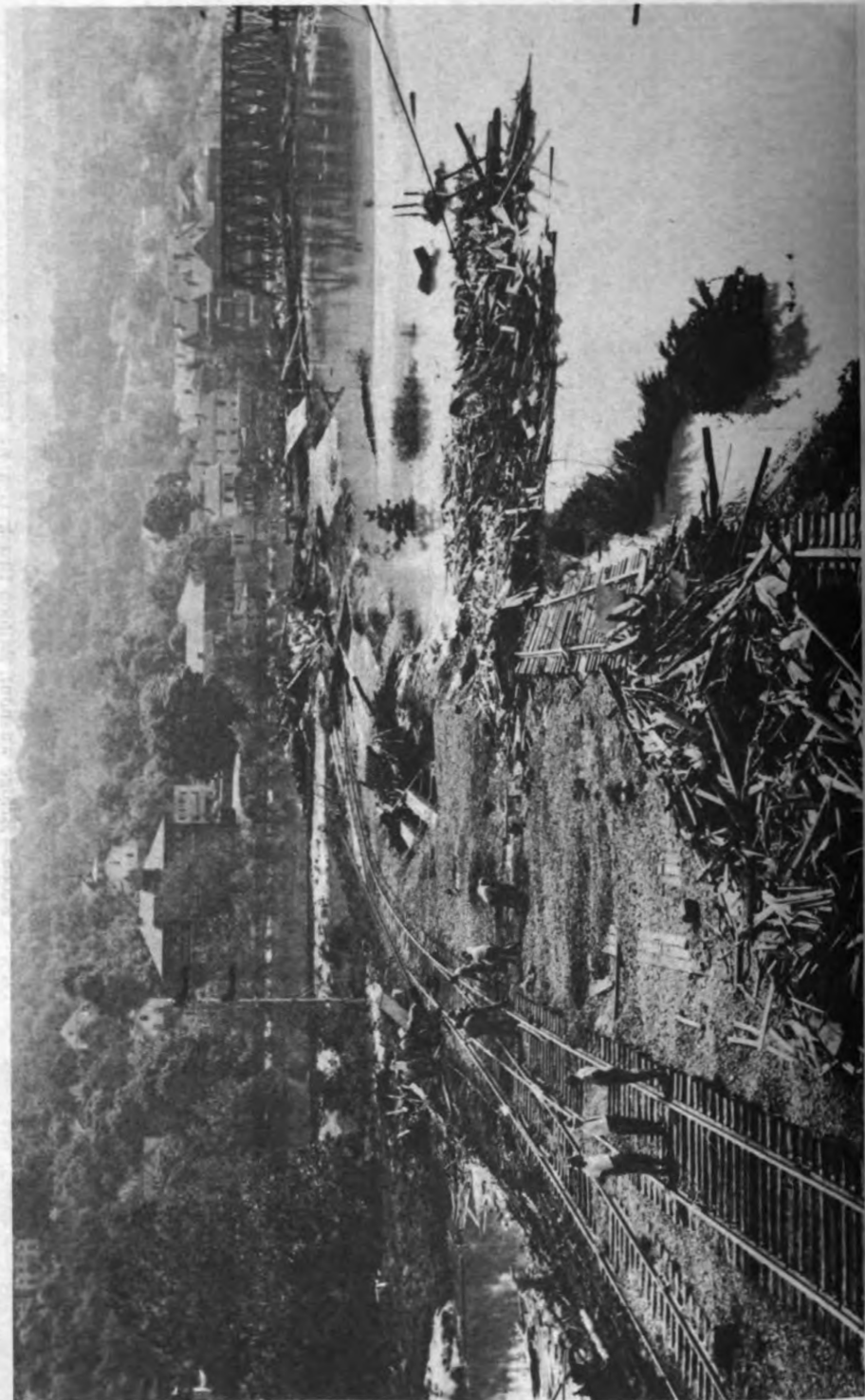


Flood.—Railroad yards, Putnam, Conn.

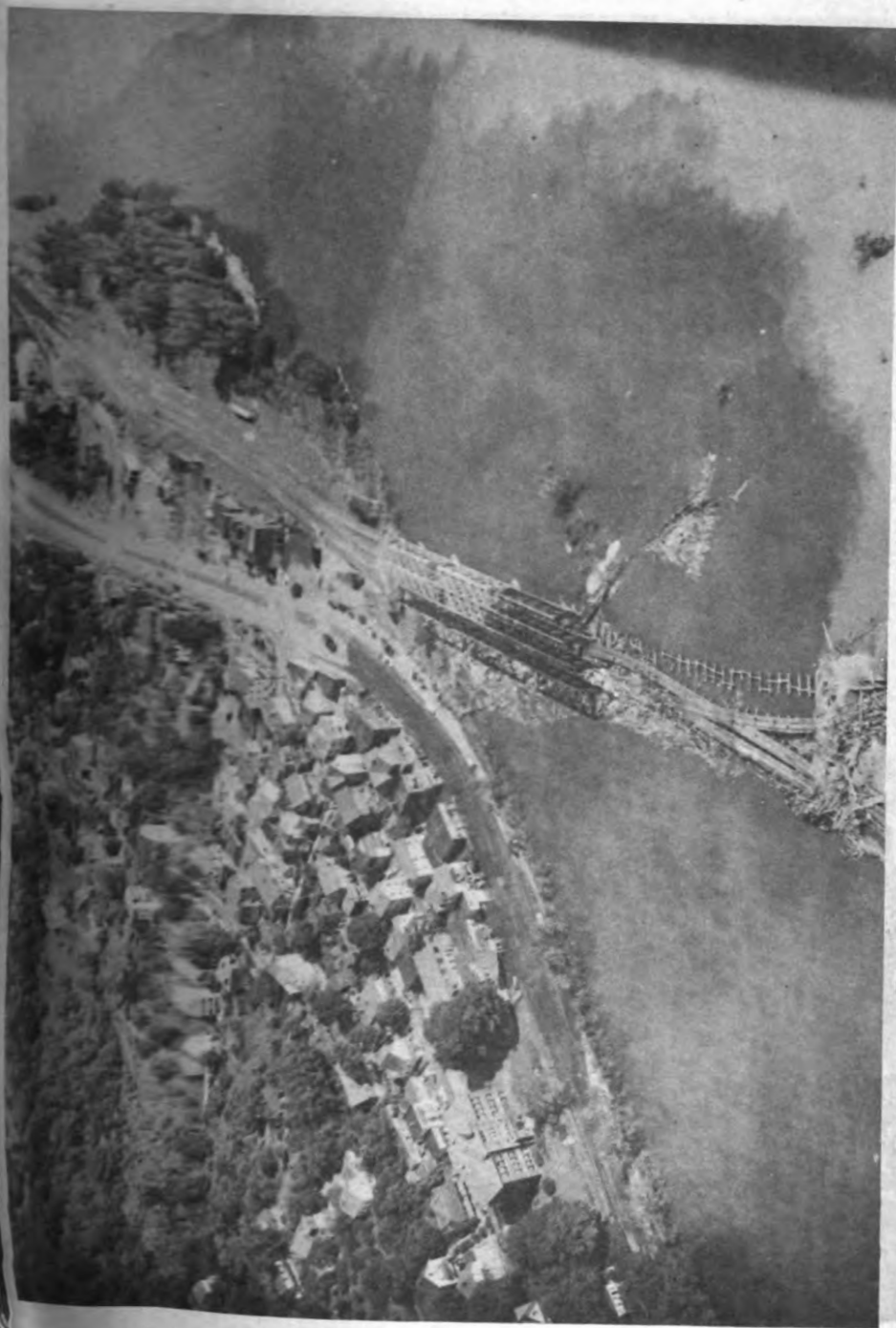
Hartford Times  
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Flood.—Bridge washout, Salmon Brook, Granby, Conn.



From — Bridge washed out, Derby Junction, Conn.



Flood.—Bridge washout, Derby Junction, Conn., looking south.

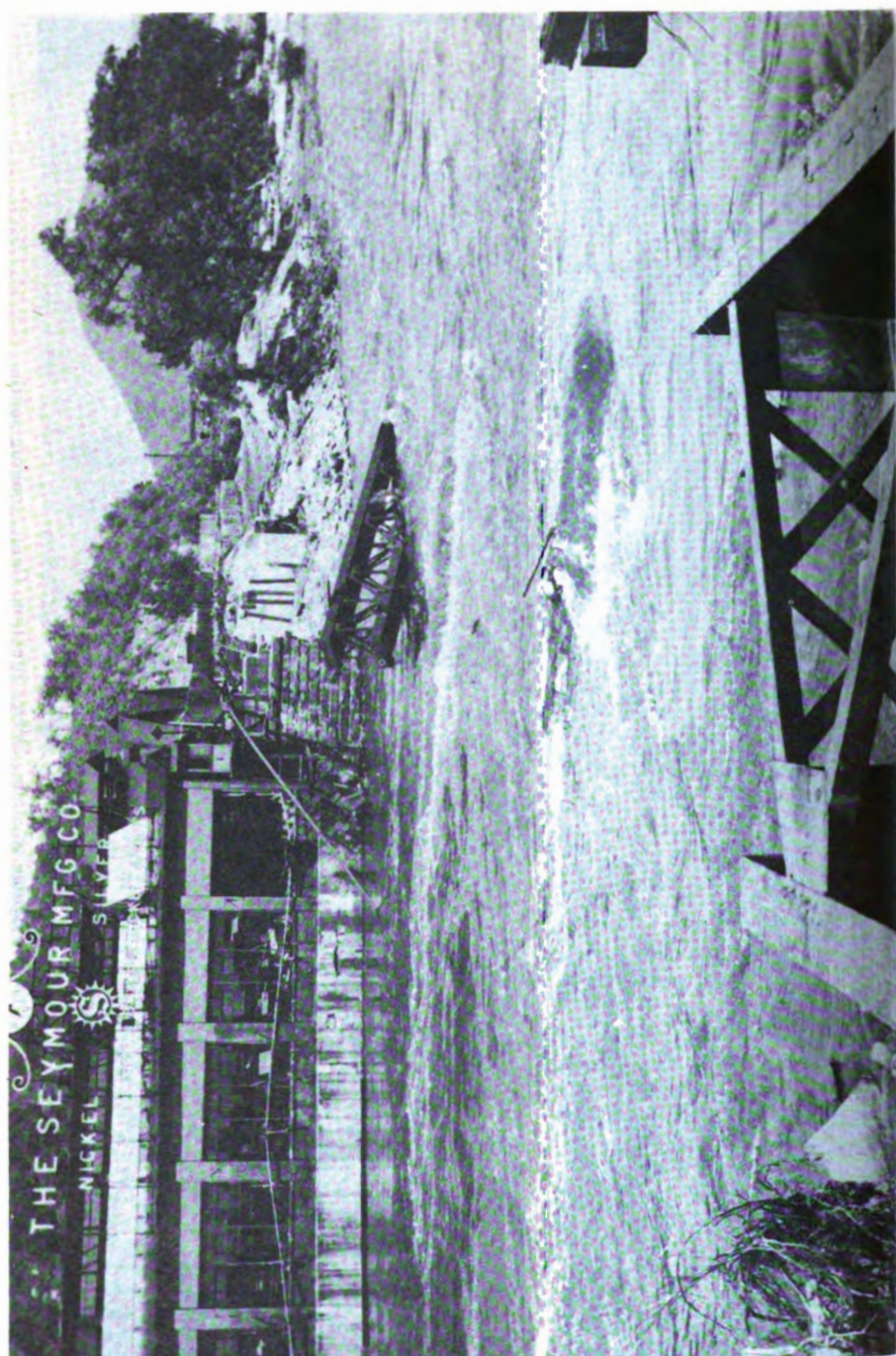
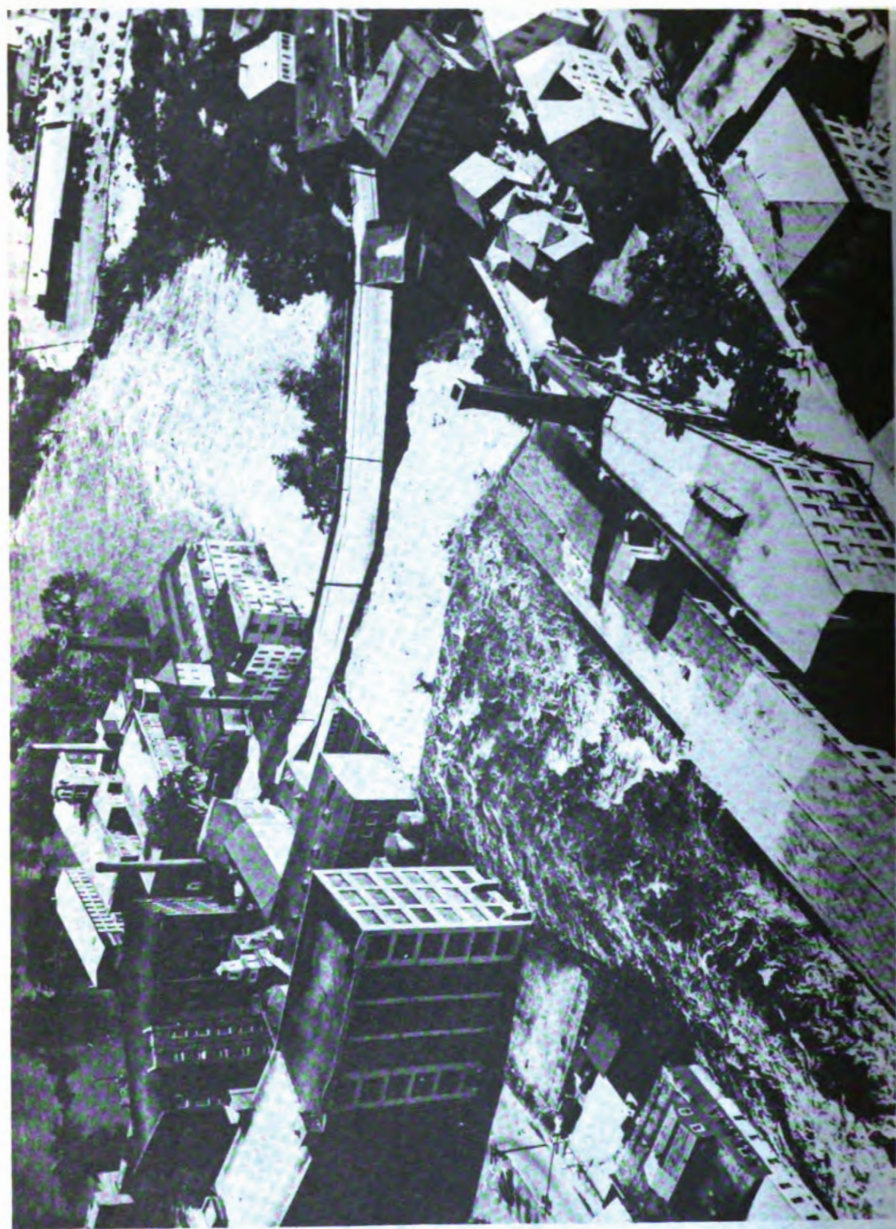


Photo.—Bridge washed out, Seymour, Conn.



Flood.—Woonsocket, R. I.

Rhode Island Development Council  
photo



Flood, — Woonsocket, R. I., aerial view of flood, August 1955.

Rhode Island  
Development Council  
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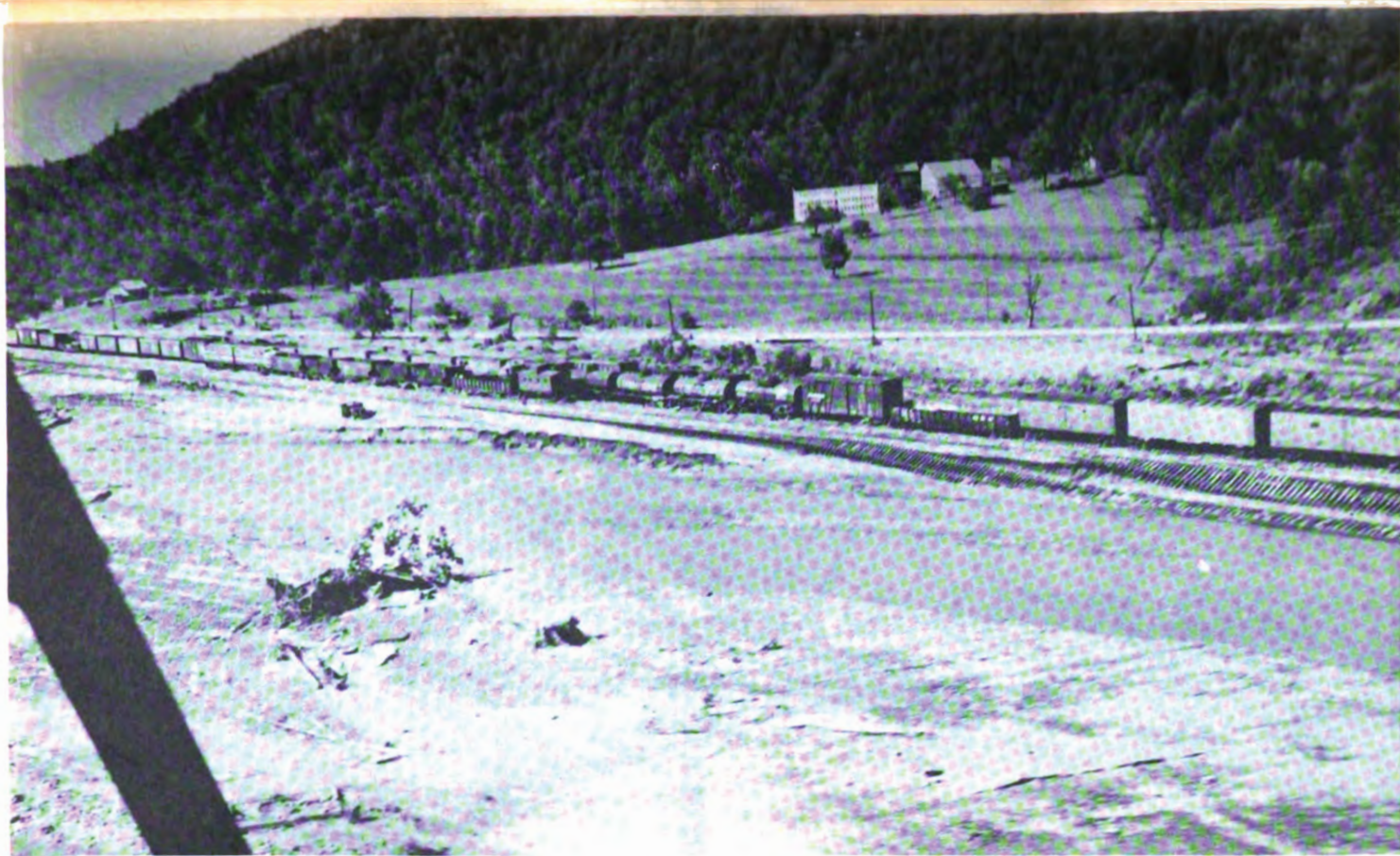
**Flood.**—Aerial view near Woonsocket, R. I., in August 1955, showing portion of Precious Blood Cemetery washed away by flood.

Rhode Island  
Development Council  
photo



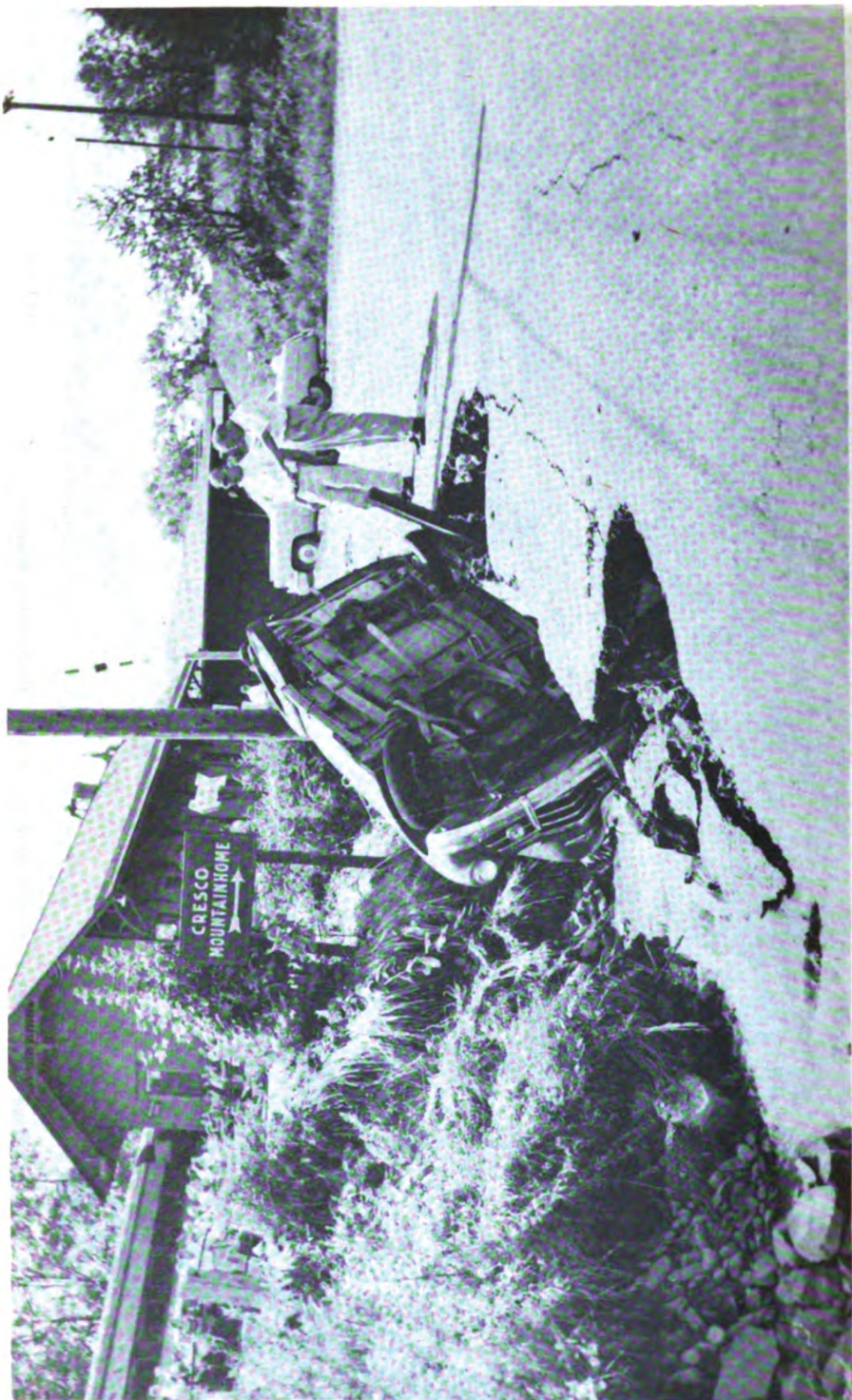
Flood.—A washed-out bridge south of Scranton, Pa. August 20, 1955.

U. S. Army photo



**FLOOD.**—An aerial view of a stalled train in the Stroudsburg, Pa., area during one of the worst floods on the east coast. August 20, 1955.

U. S. Army photo



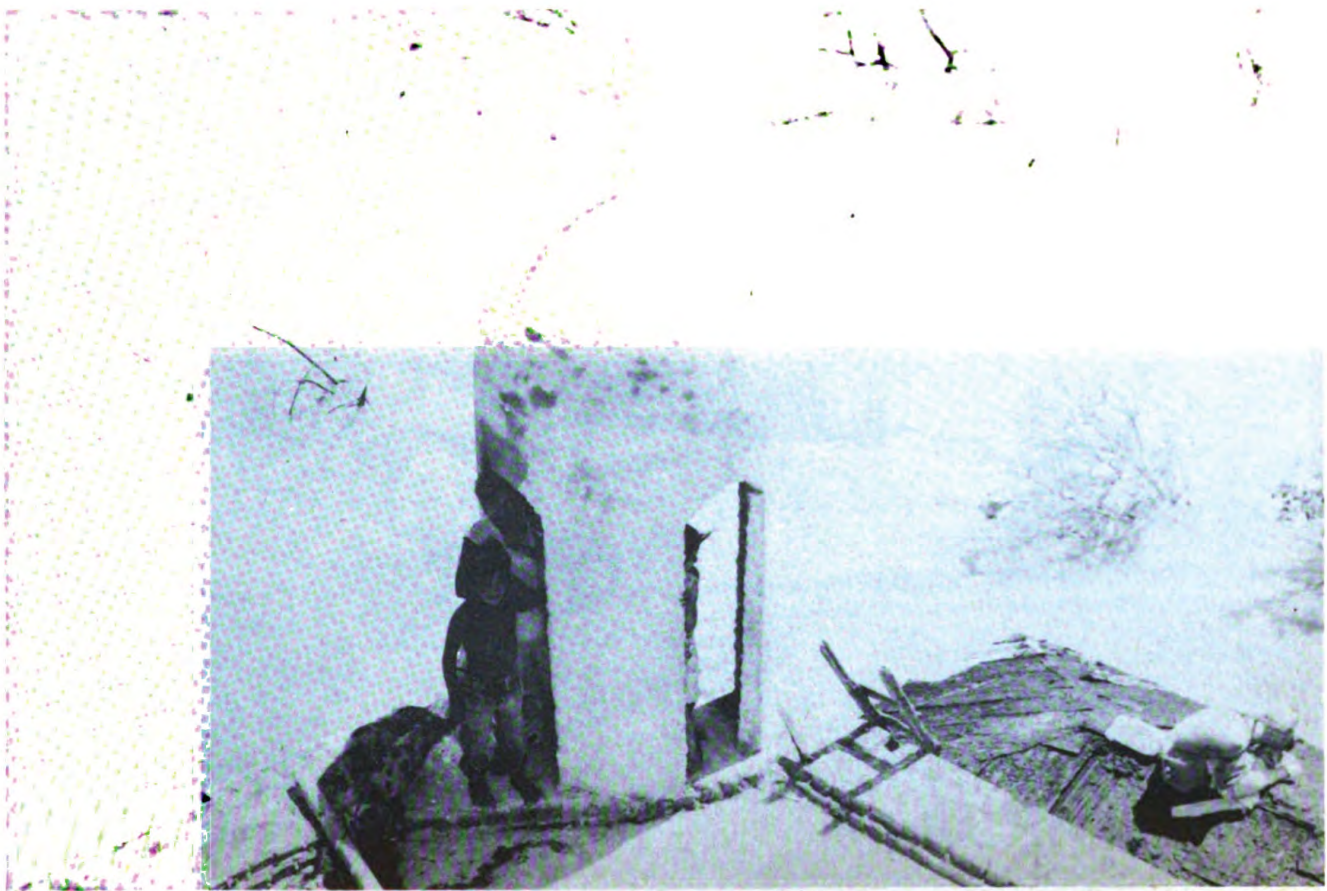
Flood.—Wrecked car caused by flood near Cresco Mountainhome, Cresco, Pa.  
August 20, 1955.

U. S. Army photo



**FLOOD.**—A United States Navy helicopter from the U. S. Carrier *Saipan* rescues a Mexican family near Tampico, Mexico.

U. S. Navy photo



FLOOD.—A Mexican woman and her three children are stranded by flood waters from Hurricane Janet on top of a church at Tampico, Mexico.

U. S. Navy photo

### III. TIDAL WAVES

Strictly speaking, as used scientifically, the term "tidal wave" usually refers to a large destructive ocean wave produced by a submarine earthquake. In common usage, however, the term "tidal wave" is also applied to a sudden rising of the tidal level due to meteorological effects, particularly in cases where the ocean is driven toward the land by great winds. The main Federal responsibility for recording tidal levels rests with the Coast and Geodetic Survey in the Department of Commerce. This agency draws a distinction between the two usages of the term "tidal wave" above noted. It refers to the first connotation as seismic sea waves, using the terms "sea wave," "tidal wave," and "tsunami" (a Japanese designation of the phenomenon) as synonyms. The second connotation is referred to by the agency as storm-water levels. In either event, severe damage to property and injury to life can occur from a sudden rising of the ocean level.

The seismic sea wave historically has proved to be the larger in size, ranging up to 80 feet in height from recorded observations. Such a sea wave travels at tremendous speed, normally ranging from 300 to 580 knots (nautical miles per hour). Such waves attain their highest speed in waters of great depth. In shallower waters and wherever delayed by outcroppings of land, the speed of the wave decreases considerably.<sup>1</sup>

However, the height of tidal waves increases as their speed is reduced and they can become dangerous even when at a great distance from their origin. In deep water on the open sea, the height of a seismic wave is probably not more than a few feet, and the wave's length may be of the order of 100 miles. Consequently they are relatively harmless in the open sea and will usually pass a ship unnoticed. Nevertheless a small wave warrants reporting, for it may become large and destructive at another place. It has been suggested that the wave may be directional, with a stronger impulse in some directions than in others. Though such a wave travels outward in all directions from the epicenter of the earthquake, some areas gain protection due to interference with the wave by topographic features.

Not all submarine earthquakes cause seismic sea waves. Sometimes when one is produced, the wave is small and does not gain in size in any area of potential damage. But waves that do become large are potential killers of life and destroyers of property. To determine whether a particular earthquake has generated a seismic wave requires observation.

Due to their great length and low height, seismic waves cannot usually be detected at sea either from a ship or from the air. Even those aboard a ship standing offshore during one tidal wave at Hawaii noticed no unusual shipboard effect of the seismic wave, although they could see the wave breaking on shore with destructive effect.

<sup>1</sup> The speed varies according to the square root of the product of multiplying the acceleration of gravity by the depth of water.

In the case of the 2 most recent occurrences of interest to the United States, the sea waves of April 1, 1946, and November 4, 1952, had wave lengths measured from crest to crest varying from 98 to 356 nautical miles. The time between crests varied from 20 to 30 minutes, as compared with the usual range of from 10 to 40 minutes.

The usual pattern of sea waves is to cause a slight rise in the ocean level initially, followed by a sizable recession in the water level. Because the initial rise in level is comparatively slight, most recorded observations of sea waves initially note a severe recession in the sea level. Following periods of a high rise in tide level and a severe recession in tide level have been noted by observers. The oscillations of the wave frequently continue throughout the following day after its effect has been originally noted, and may last for several days.

At times the rise and fall of a seismic wave is a noticeable swell without the presence of any boring. In certain locations, the crest may overtake the trough some distance offshore, so that the wave advances to shore as a bore, or wave with a steep, churning front. On such occasions the boring action may result in increased damage, forming the most destructive part of the wave.

By contrast, where the rise of the wave is quiet without boring effect, the outflow of water to the sea between crests may be rapid and destructive, carrying great rocks and buildings with it. At such a time, the mere proximity of a ship to shore is dangerous. The 1946 wave in the Aleutian Trench demolished Scotch Cap Light Station despite its location on a promontory 57 feet high.

Although, as previously noted, the United States' interest in sea waves did not become widespread until 1946, historical records of the occurrence of seismic sea waves have been maintained for centuries. In an article entitled "List of Seismic Sea Waves" by N. H. Heck, appearing in the October 1947 issue of the bulletin of the Seismological Society of America, records of 270 such waves are noted, beginning in 479 B. C., when a tidal wave was observed at Potidaea (later renamed Cassandra) in Greece on the Macedonian Peninsula. The article notes that the compilation is necessarily incomplete due to the lack of observation points in areas almost certainly experiencing seismic sea waves.

Of the 270 seismic sea waves recorded through 1946, only a relatively small number affected areas now under United States dominion. These are listed in their order of occurrence as follows:

1. July 27, 1788: Alaska, Sannak, Unga, and Shumigan Islands, also Aliaska, overflowed by tidal wave.
2. December 21, 1812: Destructive earthquake in Santa Barbara, Calif., with small sea wave near Refugio and at Santa Barbara.
3. February 20, 1835: Waves swept over Maui at Hawaii.
4. November 7, 1837: A 20-foot wave at Hilo, T. H.
5. July 10, 1855: Heavy waves rolled in at Point Sur in southern California.
6. November 18, 1867: A wall of water 20 feet high swept the harbors of St. Thomas and St. Croix, V. I. The wave was strong on adjacent islands and the east coast of Puerto Rico.
7. March 17, 1868: Small sea wave near St. Thomas, V. I.
8. April 2, 1868: Waves 40 to 50 feet high were reported on the island of Hawaii near the epicenter. The ebb and flow of the sea was observed 13 times, with a 7 or 8 minute interval between each flow. At Honolulu on the Oahu Island the interval was 15 minutes.

9. January 20, 1878: Manu, T. H.
  10. August 29, 1878: Town of Makuslin on Unalaska Island visited by earthquake and tidal wave.
  11. October 6, 1883: Augustin, Aleutian Islands had sea waves.
  12. 1885: San Francisco reported a series of waves, undoubtedly from a distant unknown source.
  13. September 10, 1899: Yakutat Bay, Alaska, had a 30-foot high wave in the bay but none in the nearby open sea.
  14. December 30, 1901: An earthquake caused several tidal waves at Kenai and Cook Inlet, Alaska.
  15. July 1, 1906: A sea wave hit the Marshall Islands.
  16. April 25, 1916: Bocas, Panama (near the Canal Zone) experienced a slight sea wave that carried debris 200 meters inshore.
  17. May 1, 1917: Wave 40 feet high hit Samoa. A pronounced wave was recorded at Honolulu and on the west coast of the United States. An earthquake was recorded the same day.
  18. June 25, 1917: A 40-foot tidal wave and an earthquake hit Samoa, which was recorded at Honolulu and on the west coast of the United States.
  19. October 11, 1918: On the northwest coast of Puerto Rico a wave from the northwest reached 15 feet in height at Port Borinquen, and about 12 feet at Aguadilla, going 100 meters inland. At Point Jiguero the wave was 18 feet high, and 13 feet at Mona Island. Elsewhere the wave was moderate.
  20. October 25, 1918: Wave caused by earthquake was recorded at Galveston, Tex., tide gage.
  21. August 1920: A tidal wave and earthquake hit Pago Pago, Samoa.
  22. February 3, 1923: Seven tidal waves swept ashore at Hilo, T. H.
  23. November 4, 1927: A submarine earthquake off Point Arguello caused a 6-foot high wave at Surf, Calif.
  24. November 10, 1938: A violent seaquake off the Alaskan Peninsula sent tidal waves across the Pacific.
  25. April 1, 1946: From an epicenter in the Aleutian trench off the Aleutian Islands, tidal waves hit many spots in the Pacific Ocean. A 20-foot wave struck Hilo, T. H. Waves were also reported from the west coast of North and South America, and many islands in the Pacific, including Unimak Island, Alaska.
  26. September 27, 1949: An epicenter near the southern coast of Alaska caused a tidal wave.
  27. August 21, 1951: An epicenter near Hawaii caused a tidal wave.
  28. November 4, 1952: A severe undersea earthquake off the Kamchatka Peninsula, U. S. S. R., sent out a series of sea waves recorded on gages throughout the Pacific Ocean area and on the west coast of North, Central, and South America. Records were even obtained at Benecia and Pittsburg, Calif., about 30 and 45 miles, respectively, inside San Francisco Bay, and at Kitimat, British Columbia, 50 miles up Douglas Channel.
- From the foregoing, it is noted that seismic tidal waves touching United States territory occurred mainly in the Pacific area (including Alaska) and on the west coast of the United States. Not more than 5 of the 28 listed above were recorded in the Caribbean or Gulf of Mexico area, and none in the Atlantic Ocean area.

The Coast and Geodetic Survey stated in 1953 that the largest seismic sea waves on the west coast of the United States for which we have records are those from the Aleutian earthquake of April 1, 1946, and the Kamchatka earthquake of November 4, 1952. Table 28 gives data on these waves for certain west-coast tide stations. The November 1952 waves had an 8-foot range on the outer coast at San Francisco, but occurred at low tide. In order to enable computation of the water height assuming the wave occurred at another stage of the tide, the table sets forth the heights of the highest crests and the lowest troughs with respect to the level of the tide at the time of measurement. Combining these statistics with tide levels would show the heights that would have been reached had the same waves occurred at those stages of the tide.

TABLE 28.—*Seismic sea waves on the United States Pacific coast*

Station	Date	Range of largest single wave	Waves referred to tide level at the time		Tide planes referred to mean lower low water			
			Highest wave crest	Lowest wave trough	Highest tide	Mean higher high water	Lowest tide	Mean sea level
		<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>
Neah Bay, Wash.....	April 1946.....	1.2	0.5	-0.7	11.9	8.2	-3.6	4.4
	November 1952.....	1.5	.7	- .8				
Astoria, Oreg. (Columbia River).....	April 1946.....	.8	.4	- .4	12.1	8.2	-2.8	4.3
	November 1952.....	5.9	3.0	-3.0				
Crescent City, Calif.....	April 1946.....	6.8	4.2	-3.3	10.0	6.9	-2.5	3.7
	November 1952.....							
San Francisco, Calif. (outer coast).....	April 1946.....	8.1	5.0	-3.1	8.0	5.9	-2.5	2.2
	November 1952.....							
San Francisco, Calif. (Presidio).....	April 1946.....	1.7	.9	- .8	8.3	5.7	-2.5	2.0
	November 1952.....	3.5	1.7	-1.9				
Avila, San Luis Obispo Bay, Calif.....	April 1946.....	8.5	4.5	-4.4	8.0	5.3	-2.5	2.8
	November 1952.....	9.5	4.5	-5.0				
Port Hueneme, Calif.....	April 1946.....	5.5	2.8	-2.8	7.5	5.4	-2.5	2.8
	November 1952.....	4.7	2.4	-2.5				
Los Angeles Harbor (berth 60), Calif.....	April 1946.....	2.5	1.8	-1.5	7.6	5.4	-2.6	2.8
	November 1952.....	2.0	1.1	-1.3				
La Jolla, Calif.....	April 1946.....	1.4	.8	- .8	7.4	5.2	-2.5	2.7
	November 1952.....	.8	.6	- .4				

Detailed analyses of these 1946 and 1952 tidal waves have been printed.

That for the 1946 wave appears in a paper by C. K. Green entitled: "Seismic Sea Wave of April 1, 1946, as Recorded on Tide Gages" included in Transactions of 1946 of the American Geophysical Union, volume 27. Interesting highlights from this report follow. The wave was recorded at 15 United States Coast and Geodetic Survey tide stations on the Pacific coast and at Honolulu. It was also recorded at stations in Canada and Central and South America. Approximately 20 recording stations ranged from 1,000 to 8,000 statute miles from the epicenter of the earthquake, which was recorded as happening in depths of 2,000 fathoms, about 80 miles southeast of Unimak Island, Alaska, on the steep slopes of the Aleutian Trench. The account noted that more data were contained in these records than had ever before been available for a tidal wave originating in this area.

Half hourly travel-time curves are shown in figure 15 based on the normal velocity formula for long waves. Black dots on the coast show location of tide gages that recorded the wave. Open circles

indicate operating gages at places not visited by the tidal wave. Since the speed of the wave increases with depth of water, the probable path is not always the single great circle from the epicenter. The wave may travel faster following deep waters on a non-great-circle route. The curves in the figure show the travel time of the wave to be about the same to the Hawaiian Islands and the States of Washington and Oregon and northern California. The curves also show the retarding effect of the shallower water areas in the Gulf of Alaska. The wave's greatest velocity on its way to the Hawaiian Islands could have been as high as 600 statute miles per hour while crossing the 4,000-fathom depths of the Aleutian Trench. Actually, the velocity of the wave to Honolulu was 490 statute miles per hour.

FIGURE 15. Travel-time curves, seismic sea wave of April 1, 1946

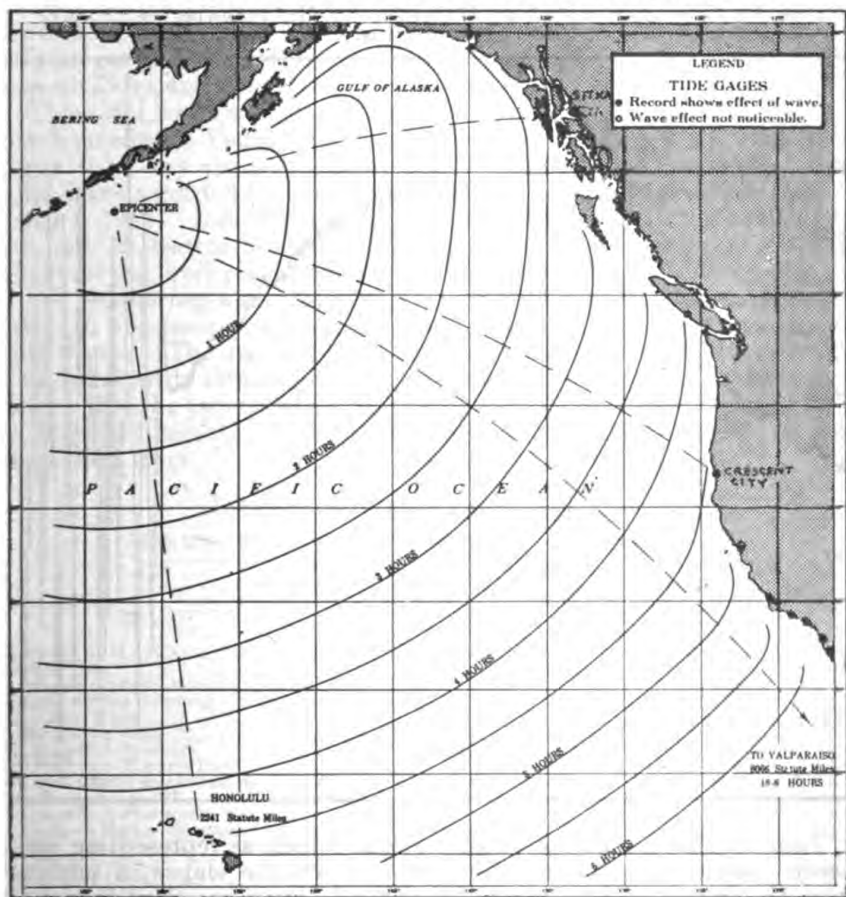


Figure 16 is a tide marigram showing a height scale in feet along the left edge and a time scale in hours along the bottom. The height scale does not refer to any base datum but is used merely for the purpose of showing variation in height. The figure shows the tide curve at Honolulu for 10 hours on the day of the seismic wave. Long

and short period oscillations of small amplitude, common to Honolulu Harbor can be noted superimposed on the rising and falling tide until the wave's arrival at about 1700 hours, Greenwich time. The disturbance started with a rise of 6 inches in 6 minutes followed by a fall of 2 feet in  $7\frac{1}{2}$  minutes. This general pattern was noted at all stations, the average ratio of fall to rise being about 1 to 3, after the effects of tide are eliminated. Eyewitnesses are prone to miss the initial rise of the water level and state that the disturbance started with a recession which was followed by three waves. As noted from the actual recording on the tide gage, it is the peak of the successive waves which apparently catches the attention of the observers, but in fact the resulting oscillation continues for some time after the initial arrival of the tidal wave.

FIGURE 16. Tide gage record at Honolulu, T. H., following earthquake of April 1, 1946

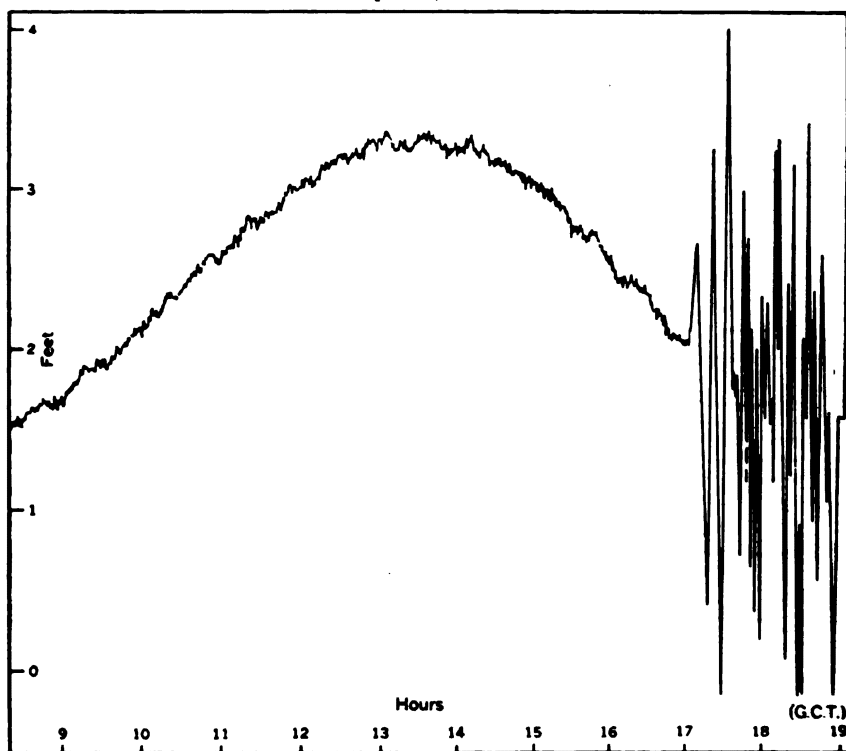


Table 29 shows nine recording stations chosen as representing open ocean conditions. Scaling from the records the elapse in minutes from the initial crest to trough of the tidal wave resulted in a half wave of 7.8 minutes, making the full wave 15.6 minutes. This corresponds to a wave length of 100 to 150 miles in the deeper ocean areas.

TABLE 29.—Wave period; seismic sea wave of Apr. 1, 1946

Station	Time interval, first crest to first trough	Station	Time interval, first crest to first trough
	<i>Minutes</i>		<i>Minutes</i>
Honolulu, T. H.	7½	Talara, Peru	8
Clayoquot, Canada	8	Matarani, Peru	8
Crescent City, Calif.	7	Valparaiso, Chile	9
San Luis Obispo Bay, Calif.	8		
Port Hueneme, Calif.	7½	Mean (half-wave period)	7.8
La Jolla, Calif.	7½	Wave period	15.6

Details of the tidal wave of November 4, 1952, have been printed in Special Publication No. 300 of the Coast and Geodetic Survey, United States Department of Commerce, entitled "The Tsunami of November 4, 1952, as Recorded at Tide Stations." The publication was prepared by Chief W. B. Zerbe, Section of Oceanography, Division of Tides and Currents.

This tidal wave was caused by a severe earthquake under the sea off the Kamchatka Peninsula. It was probably recorded by more tide gages than any preceding tidal wave. It was also the most severe tidal wave recorded by Coast and Geodetic Survey gages since that of April 1, 1946. Indications were that it was larger than the 1946 wave but not as destructive. It was characterized by more gentle rising of the ocean level rather than any boring action.

For comparing wave data for the two tidal waves of 1946 and 1952, table 30 has been prepared for places where gages were operating at both times. The resulting mixed pattern is notable. Neither wave was consistently larger than the other at all places. The largest wave recorded of the two occurred at Talcahuano, Chile, in 1952, amounting to 12 feet in height. That particular place had no gage record for the 1946 tidal wave.

TABLE 30.—Maximum recorded rise or fall

[This table lists only places at which gages were operating on both dates]

Station	1946 <sup>1</sup>	1952 <sup>1</sup>
	<i>Feet</i>	<i>Feet</i>
Honolulu, T. H.	4.1	4.4
Sitka, Alaska	2.6	1.5
Clayoquot (Tofino), British Columbia	1.9	2.0
Victoria, British Columbia	.7	1.4
Neah Bay, Wash.	1.2	1.5
Crescent City, Calif.	5.9	6.8
San Francisco (Presidio)	1.7	3.5
San Francisco (Hunters Point)	.5	1.2
San Luis Obispo Bay (Avila)	8.5	9.5
Port Hueneme, Calif.	5.5	4.7
Los Angeles Harbor (berth 60)	2.5	2.0
Los Angeles Harbor (Mormon Island)	2.2	3.6
La Jolla, Calif.	1.4	.8
San Diego, Calif.	1.2	2.3
Antofagasta, Chile	5.9	4.7
Valparaiso, Chile	5.0	5.9

<sup>1</sup> The 1946 maximum was 8.5 feet at Avila, Calif.

<sup>2</sup> The 1952 maximum was 12 feet at Talcahuano, Chile.

Table 31 shows observed average speeds for the 1952 tidal wave for selected points.

TABLE 31 — *Observed average wave speed to selected stations*

Station	Distance	Travel time	Speed
	<i>Nautical miles</i>	<i>H. M.</i>	<i>Knots</i>
Guam.....	2, 443	5 21	457
Canton Island.....	3, 633	8 02	452
Pago Pago.....	4, 304	9 43	443
Midway.....	1, 796	4 23	410
Honolulu.....	2, 724	6 16	434
Hilo.....	2, 893	6 37	437
Adak.....	893	2 29	390
Kodiak.....	1, 985	5 45	345
San Francisco (Presidio).....	3, 265	8 40	377
Acapulco, Mexico.....	5, 101	12 37	404
Callao, Peru.....	7, 189	18 50	382
Valparaiso, Chile.....	8, 348	20 40	404

This particular tidal wave presented a confusing feature in the wave period. The shortest recorded period of the initial wave was 8 minutes, the longest was 100 minutes; and the average for any station proved to be 38 minutes.

#### WAVELENGTHS

The length of the 1952 wave varied from 98 nautical miles at Canton Island to 356 miles at Kodiak, Alaska. In the case of this particular tidal wave oscillations continued for several days. The exact time of cessation is difficult to determine because the areas where the tide gages are located experience local seiche or oscillation of the water surface in a harbor area.

One feature worth noting is that eyewitness accounts from observers often show waves larger than from the tide records. Mr. Zerbe concludes that this does not mean that the reports were erroneous, in view of the fact that gages seldom seem to be located where the waves are largest. In Oahu the gage showed about  $4\frac{1}{2}$  feet as against a reported 13 feet on the northwest coast. Two facts could explain this difference. Waves were probably much larger at places on the northwest coast than on the sheltered side of the island where the tide gage was located. Moreover, the small intake to the tide gage float wells, designed to dampen wind waves in the well, does not permit the tide gage to record the full amplitude of seismic waves. The resulting dampening effect of a 1-inch intake in a 12-inch well would be about one-eighth foot at Honolulu, but a foot or more at Midway and Attu Islands.

#### STORM WATER LEVELS OF TIDAL WATERS

With reference to the popular misconception of what constitutes a tidal wave, the Coast and Geodetic Survey has supplied table 32 listing for the Atlantic and Pacific coast the heights and dates of highest water levels recorded at Coast and Geodetic stations. These maximum heights are more likely caused by meteorological conditions such as wind rather than by submarine disturbances. They have, however, caused more destruction in the continental United States, especially on the east coast, than true tidal waves.

Only those heights which exceed mean high water on the Atlantic coast, or mean higher high water on the Pacific coast, by 5 feet or

more have been included. The selection of the value 5 feet is somewhat arbitrary. It is considered that with such a height considerable flooding would occur in low areas. The datum of mean higher high water is used for the Pacific coast because there is considerable inequality in the heights of the tide on that coast and the higher of the two high waters of the day is the more significant tide.

The last column lists the average yearly highest water levels which represent the mean of the highest tide of each year covered by the series of observations at each station. Since these are average values of highest tides at each station they serve as an index of the possible damaging effects of the individual extreme heights listed for each station. At Eastport, for example, the highest water level recorded was 5.0 feet above mean high water. As the average yearly highest at Eastport is 4.0 feet above mean high water the extreme height was only 1 foot in excess and would not be considered destructive. However, at such places as Newport, Providence, and Galveston it will be noted that the extreme heights are as much as 7 to 12 feet above the average yearly highest for those stations.

In considering damage due to flooding it should be noted that the heights listed in these tables refer to the heights in the float wells of the tide stations. As the float wells have a small opening which damps wave action the heights do not take into account the elevation of waves.

TABLE 32.—STORM WATER LEVELS—*Record of heights exceeding mean high water by 5 feet or more and average yearly highest—Atlantic and Pacific coasts*

## ATLANTIC COAST

Place	Series	Date	Height above mean high water	Average yearly highest above mean high water
			Feet	Feet
Eastport, Maine.....	1930 to 1955.....	Nov. 20, 1945.....	5.0	4.0
Woods Hole, Mass.....	1933 to 1955.....	Sept. 21, 1938.....	9.4	2.8
		Sept. 14, 1944.....	5.7	
		Aug. 31, 1954.....	8.8	
Newport, R. I.....	1931 to 1955.....	Sept. 21, 1938.....	10.3	2.9
		Aug. 31, 1954.....	7.6	
Providence, R. I.....	1938 to 1947.....	Sept. 21, 1938.....	15.6	3.3
		Sept. 14, 1944.....	6.5	
		Aug. 31, 1954.....	13.5	
New London, Conn.....	1938 to 1955.....	Sept. 21, 1938.....	8.5	3.5
		Sept. 14, 1944.....	5.0	
		Nov. 25, 1950.....	5.5	
		Aug. 31, 1954.....	7.5	
Montauk, N. Y.....	1947 to 1955.....	Aug. 31, 1954.....	6.8	3.7
Willets Point, N. Y.....	1932 to 1955.....	Nov. 17, 1935.....	5.0	4.0
		Sept. 21, 1938.....	9.9	
		Nov. 25, 1950.....	6.2	
		Nov. 7, 1953.....	5.2	
		Aug. 31, 1954.....	7.9	
New York, N. Y.....	1920 to 1955.....	Nov. 25, 1950.....	5.1	3.1
		Nov. 7, 1953.....	5.5	
Sandy Hook, N. J.....	1933 to 1955.....	Sept. 14, 1944.....	5.3	3.1
		Nov. 7, 1953.....	5.6	
Atlantic City, N. J.....	1912 to 1920, 1923 to 1955.....	Sept. 14, 1944.....	5.4	2.9
Baltimore, Md.....	1902 to 1955.....	Aug. 23, 1933.....	7.2	2.7
		Oct. 16, 1954.....	5.0	
		Aug. 13, 1955.....	5.9	
Washington, D. C.....	1931 to 1955.....	Aug. 23, 1933.....	7.7	3.1
		Mar. 19, 1936.....	8.1	
		Apr. 28, 1937.....	5.8	
		Oct. 17, 1942.....	8.6	
		Oct. 15, 1954.....	5.4	

See footnote at end of table, p. 102.

**TABLE 32.—STORM WATER LEVELS—Record of heights exceeding mean high water by 5 feet or more and average yearly highest—Atlantic and Pacific coasts**

## ATLANTIC COAST—Continued

Place	Series	Date	Height above mean high water	Average yearly highest above mean high water
			<i>Feet</i>	<i>Feet</i>
Hampton Roads, Va.....	1928 to 1955.....	Aug. 23, 1933..... Sept. 18, 1936.....	6.3 5.0	2.8
Charleston, S. C.....	1922 to 1955.....	Aug. 11, 1940.....	5.6	2.6
Fernandina, Fla.....	1897 to 1924, 1939 to 1955.....	Oct. 2, 1898.....	7.8	2.7
Pensacola, Fla.....	1923 to 1955.....	Sept. 20, 1926.....	7.8	1.8
Galveston, Tex.....	1908 to 1955.....	Sept. 8, 1900..... Aug. 16, 17, 1915..... Sept. 14, 1919..... July 25, 1934..... Sept. 23, 1941..... Aug. 29, 1942.....	10.8 10.1 8.0 5.3 5.1 5.3	2.8

## PACIFIC COAST

Place	Series	Date	Height above mean higher high water	Average yearly highest above mean higher high water
			<i>Feet</i>	<i>Feet</i>
San Diego, Calif., to Seattle, Wash.....	( <sup>2</sup> ).....	( <sup>2</sup> ).....	<i>Feet</i> ( <sup>2</sup> )	<i>Feet</i> ( <sup>2</sup> )
Ketchikan, Alaska.....	1918 to 1955.....	Dec. 18, 1941..... Nov. 2, 1948..... Dec. 10, 1954.....	5.0 5.4 5.1	4.4
Juneau, Alaska.....	1936 to 1941, 1944 to 1955.....	Nov. 2, 1948.....	5.2	4.1
Skagway, Alaska.....	1945 to 1955.....	Oct. 22, 1945.....	5.8	4.5
Anchorage, Alaska.....	1918, 1922 to 1925.....	Oct. 12, 1923..... Nov. 9, 1923..... Sept. 5, 1925.....	5.8 5.1 6.2	4.5

<sup>1</sup> Estimated.

<sup>2</sup> No height exceeding mean higher high water by 5 feet or more.

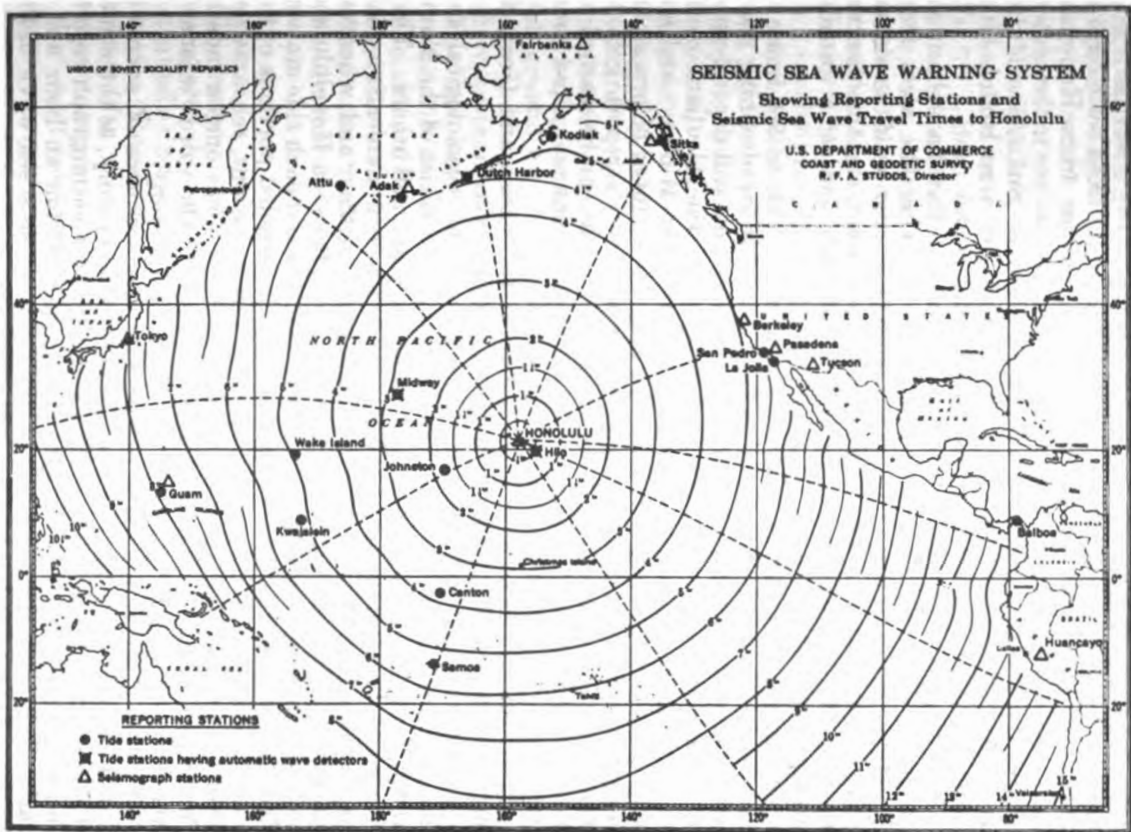
NOTE.—The year 1955 includes the period from January to August, inclusive, only.

Source: Compiled by the Coast and Geodetic Survey from records obtained at its control tide stations, September 1955.

## PREDICTABILITY AND WARNING SERVICE

Following the destructive effects of the 1946 tidal wave, the United States organized a system for detecting such waves soon after their inception and reporting them to military and civilian authorities in the Pacific area. The warning system is a cooperative undertaking involving seismological observatories for detecting and reporting large earthquakes in the Pacific area, tide stations located throughout the Pacific for detecting and reporting the resulting sea waves, a central station in Honolulu for receiving and evaluating the reports and alerting the central military and civilian agencies, and rapid communication service between all stations and Honolulu. Military and civilian agencies so informed place in operation previously made plans for warning the civilian communities for shipping and military bases. The Honolulu Magnetic Observatory of the Coast and Geodetic Survey serves as the center of the warning system. This center is to be provided promptly with the location of every earthquake that could possibly cause a wave in the Pacific and with prompt reports from observers at wave reporting stations. (See fig. 17.)

FIGURE 17. Seismic sea wave warning system showing reporting stations and seismic sea wave travel times to Honolulu



At present 10 seismograph stations are located at Adak, Fairbanks, Sitka, Berkeley, Pasadena, Tucson, Honolulu, Guam, Huancayo (Peru), and Tokyo. In order to compensate for lack of continuous watch, the Coast and Geodetic Survey stations at Fairbanks, Sitka, Tucson, and Honolulu have visual recording seismographs with an alarm to alert the observer automatically upon the occurrence of a large earthquake. Readings are sent to Honolulu from seismograph stations on the observers' initiative or on request from Honolulu. Tide stations report in similar manner. The 16 stations in the system are located at Attu, Adak, Dutch Harbor, Kodiak, Sitka, San Pedro, La Jolla, Balboa, Pago Pago, Canton Island, Johnston Island, Hilo, Midway Island, Wake Island, Kwajalein, and Guam.

At a few tide stations, seismic sea wave detectors have been installed as a precaution against delay in receiving the alert from Honolulu. It is a device that alerts the tide observer with the arrival of large waves having the period of seismic sea waves, and the observer can then examine his tide record and, if necessary, initiate a warning message to Honolulu.

Seismic sea waves travel with such great speed (300 to 500 knots in the open ocean) that the amount of time available for obtaining wave reports is very limited. The amount of usable time will depend upon the location of the earthquake. A wave from the Aleutians could reach Honolulu only 15 minutes after it arrived at Midway, and one from near Honshu might reach Attu only 30 minutes before it hit Midway. The speed with which a tide observer's report gets to Honolulu will determine how many islands or areas can be warned on the basis of that report. Every minute is important and rapid communication is essential.

The Honolulu Magnetic Observatory of the Coast and Geodetic Survey is the center of operation of the warning system.

Fast communication between Honolulu and the seismological and tide stations is provided by the communication facilities of the Navy, Army, Air Force, Civil Aeronautics Administration, and others. They give such messages a very high priority. The communication plan for seismic sea wave warning system designates primary and, wherever practicable, alternate communication channels between Honolulu and each seismograph station and between Honolulu and each tide station. Each link in the communication chain has the needed portions of the plan. Since service is required on such rare occasions, rehearsals or tests are initiated by Honolulu at unannounced times once a month. For identification, each live message begins with the word "seismo:" and each test message with the words "seismo dummy."

Whenever there is a large earthquake, the sequence of events is usually as follows: The Honolulu Magnetic Observatory, as the center of operation of the system, obtains and evaluates seismograph reports and locates the earthquake epicenter usually within an hour and a half. If it is at a place where it could not cause a sea wave in the Pacific, nothing further is done. If it is where it could cause a wave, the center calls upon selected tide stations to watch their gages, usually specifying a period of an hour or two, and to report back. Special charts show when a resulting wave should reach Honolulu and the tide stations, so that the center knows how much time can be used in obtaining reports. If the tide stations report a wave, the center notifies certain designated civil and military agencies which then put into

action their previously made plans for warning the civil population, shipping, and military bases. The civil and military authorities in the Hawaiian Islands have designated certain central agencies to receive warnings from HMO, and they are alerted by HMO whenever it believes a warning is justified by wave reports. The further dissemination of warnings is the responsibility of these agencies, the military authorities, and the civil communities. A brief description of how they are organized for such an emergency is interesting and may be helpful to others.

When HMO reports that an alarm is justified, military authorities in Honolulu issue the warnings to all military bases that might be affected. Base commanders will put into effect any precautions deemed necessary. Elsewhere warnings will be broadcast by civilian authorities. Disaster committees have been set up on all the major islands of the Hawaiian group to alert the population and to assist in evacuation and rescue as needed. In Honolulu and Hilo, former air-raid sirens now operated by the police department will be used. As a special precaution at Hilo, a seismic sea-wave detector has been installed at the tide station with its alarm in the police station. On Oahu and eventually on the other islands, Civil Air Patrol planes equipped with sirens will fly the shoreline and sound the alarm. On all the major islands police cars equipped with sirens will patrol the coastal areas. Local commercial broadcasting stations will interrupt all programs to give the latest information and instructions. Should a warning occur when a radio station is closed, it will come on the air immediately and remain on until the all clear is sounded. When there is a warning, waterfront areas should be vacated. People should seek high ground away from shore and ships should head for deep water of the open sea, though a ship in a harbor will have to base its procedure on the amount of time available.

The warning system is the response to the need of the people of Hawaii and of the Pacific military commands for such protection. While the public may be concerned about the system only when a destructive wave is imminent, it requires constant work and vigilance to keep such a farflung and seldom-used organization ready for instant action in that time of need.

#### DAMAGE

The warning system worked well in the case of the 1952 tidal wave, for despite the fact that indications were that this wave was more potentially destructive than that of 1946, not as much damage resulted from it. Recorded history shows that tidal waves can cause severe damage, far greater than that which they have ever inflicted on territory subject to United States jurisdiction.

The most severe stated damage caused by tidal wave to United States occurred in 1946 when 173 lives were lost and property damaged to the extent of \$25 million from a tidal wave which hit the Hawaiian Islands. By contrast the 1952 tidal wave resulted in no lives lost in the Hawaiian Islands and property damage to the lesser extent of \$800,000.

Material included in the list of 270 seismic sea waves noted in Mr. Heck's article indicates the much greater damage potential of tidal waves. For example, as a result of a wave which hit the northwest

coast of Japan in 869, some 1,000 lives were lost and hundreds of villages were ruined. In another tidal wave afflicting Japan in 1293, 30,000 persons were killed. Later records indicate similar magnitude in the loss of lives in the tidal waves afflicting Japan. Waves with a height of 80 feet have been reported. Such a wave flooded Callao, Peru, in 1724 and sank 19 ships.

Of the waves affecting United States territory, that hitting Alaska in 1788 caused loss of lives and drowning of livestock. During the 1867 tidal wave at the Virgin Islands, the U. S. S. *DeSoto* dashed against a wharf and lost her propeller and the U. S. S. *Monongahela* was thrown ashore. The 1868 wave hitting the Hawaiian Islands swept away the villages of Keauhou and Punaluu.

In the 1878 tidal wave at Unalaska Island, the town of Makuslin was destroyed.

In the 1923 series of waves six persons lost their lives at Hilo, T. H.

The 1946 waves also caused the loss of the lives of five men stationed at the Scotch Cap Light Station on Unimak Island, Alaska.

The November 1952 waves caused some damage to fishing boats in the harbor of Crescent City, Calif. Since the occurrence of that wave the civilian defense agency in Oregon requested the Coast and Geodetic Survey to furnish it warning through the seismic warning system.

The Coast and Geodetic Survey notes that while no places on the west coast of the United States appear to have suffered severe damage from either the 1946 or 1952 waves, one would hesitate to say that the damage would not be great in the future or that one area is more likely to be damaged than another. Even small seismic sea waves might tend to magnify the bothersome surges that occur in some harbors. Based on records for the 1946 and 1952 waves, they did not reach dangerous proportions in Juan de Fuca Strait and connecting passages. No records were available for the outer coasts of Washington and Oregon. Waves were large enough to cause damage at a number of places along the California outer coast. The largest 1952 waves on the west coast hit Crescent City, San Francisco, Avila, and Port Hueneme. Waves of  $3\frac{1}{2}$  feet were recorded at berth 174 in Los Angeles Harbor.

Earthquakes under the sea sometimes jolt a ship, giving those on board the feeling that the ship hit a rock, but it is believed that there are no observable effects of seismic sea waves on a ship at sea. From records of waves on shore it can be determined that at sea such waves are of the order 100 miles between crests and only a very few feet high. At sea they would be about as hard to observe as the tide, and their effect on a ship would be just as imperceptible.



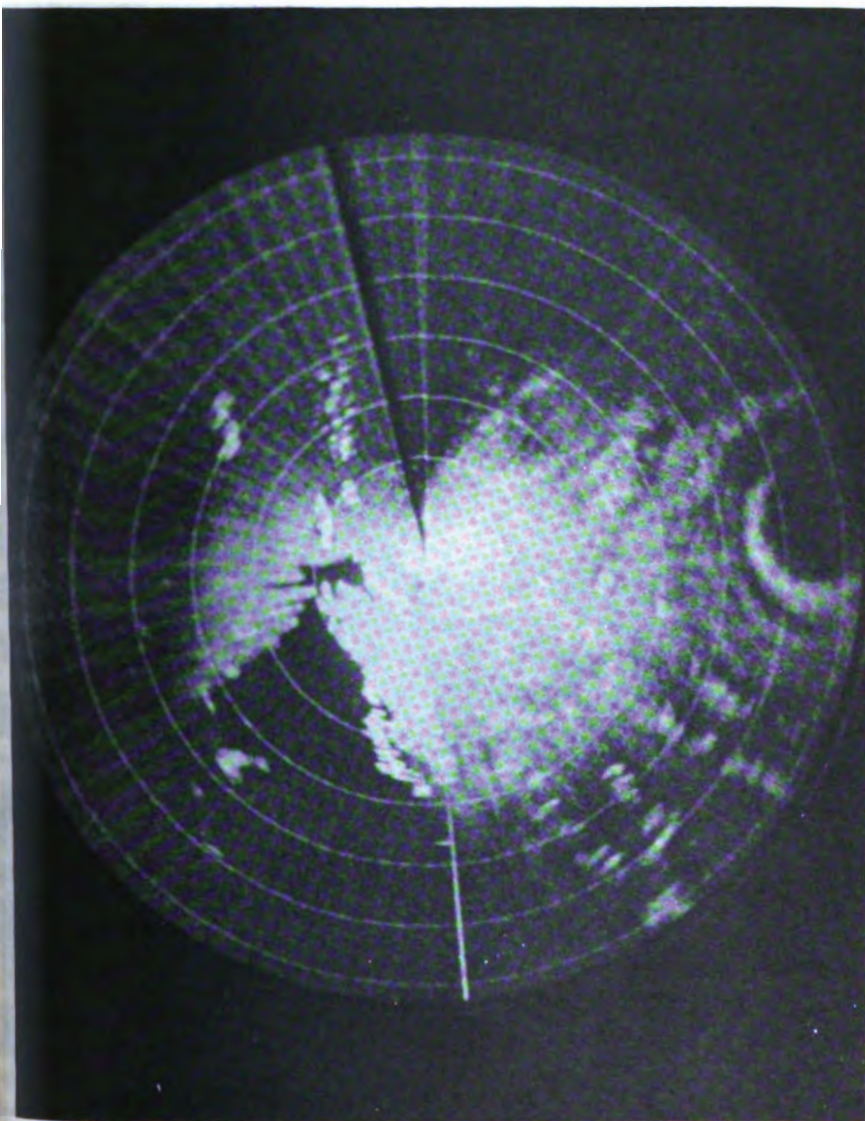
**TIDAL WAVE.**—Damage caused by five tidal waves which occurred during the disastrous earthquake in the village of Kiritappu, Japan, on the 4th of March. Huge chunks of ice were washed ashore along the main road of the village. March 8, 1952.

U. S. Army photo

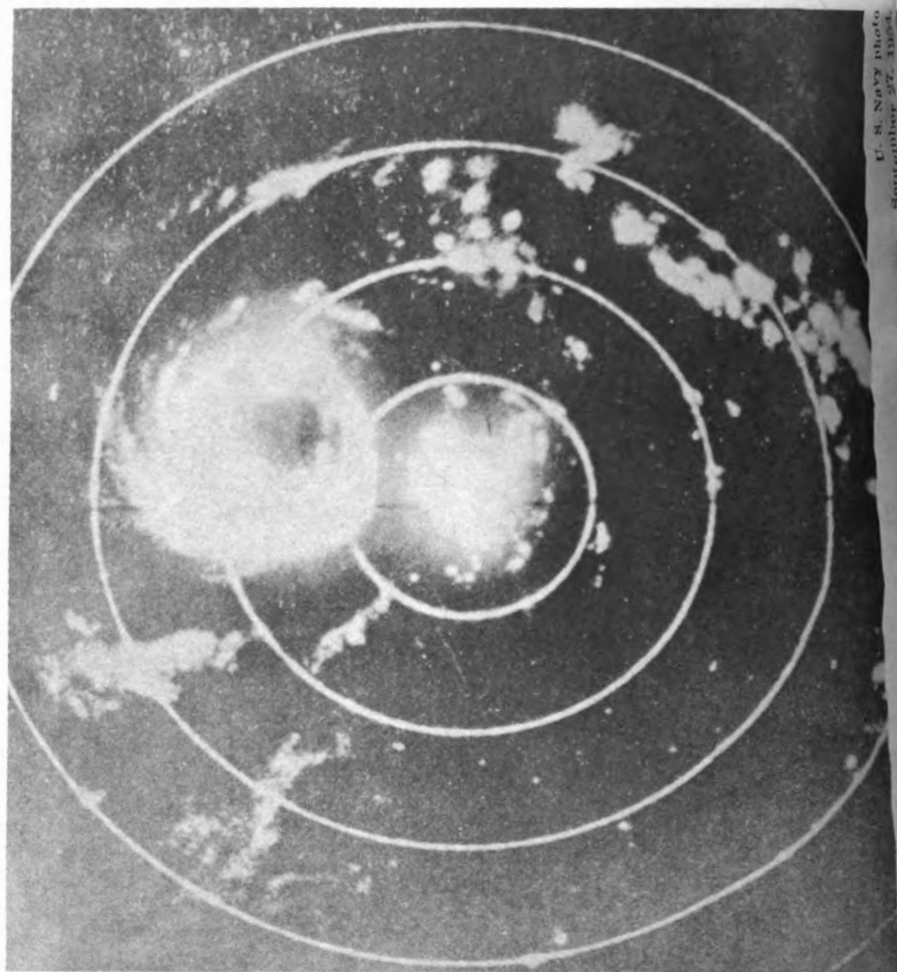


**HURRICANE.**—A Navy Banshee photoplane flies over the eye of Hurricane Connie off the coast of North Carolina on August 9, 1955. The thin broken clouds of the eye are

U. S. Navy photo



HURRICANE.—Radarscope photo of Hurricane Connie, August 3, 1955. U. S. Navy photo

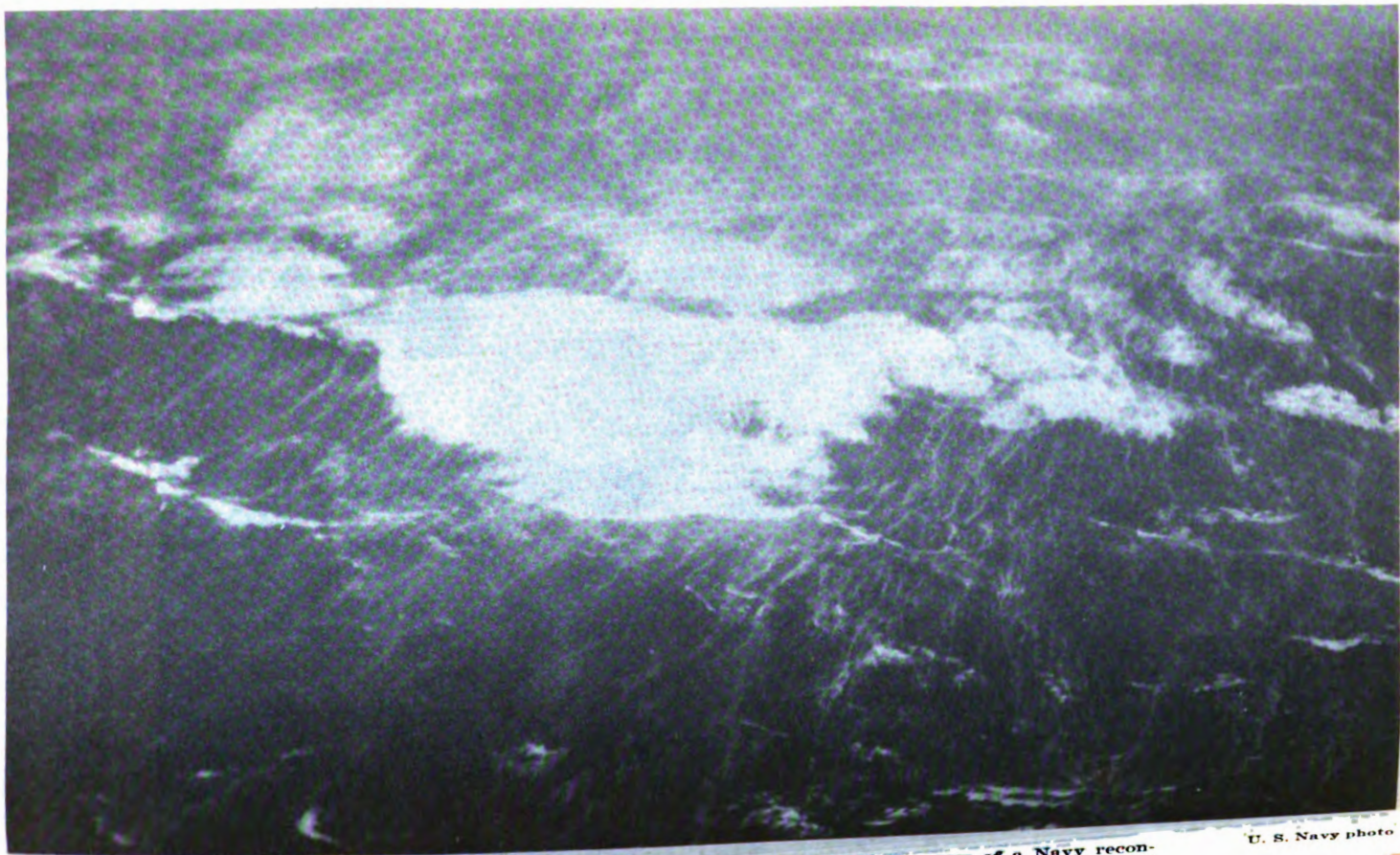


HURRICANE—This is the way a hurricane appears on the radarscope. U. S. Navy photo. September 27, 1954.



U. S. Navy photo

**HURRICANE.**—A Navy photographer braces himself with the aid of another crewman as he prepares to take aerial photograph of a hurricane from the window of a Neptune patrol plane operating over coastal waters. September 27, 1954.



U. S. Navy photo

**HURRICANE.** Just before entering the eye of Hurricane Carol the crew of a Navy reconnaissance plane observed winds of over 100 miles an hour, flying over the water on September 27, 1954.



TORNADO.—Udall, Kans., tornado, May 25, 1955.

Carl J. Whitson,  
Winfield, Kans.,  
photo



TORNADO.—Aerial view of Udall, Kans., after it was struck by tornado the night of May 25, 1955.

Wide World photo



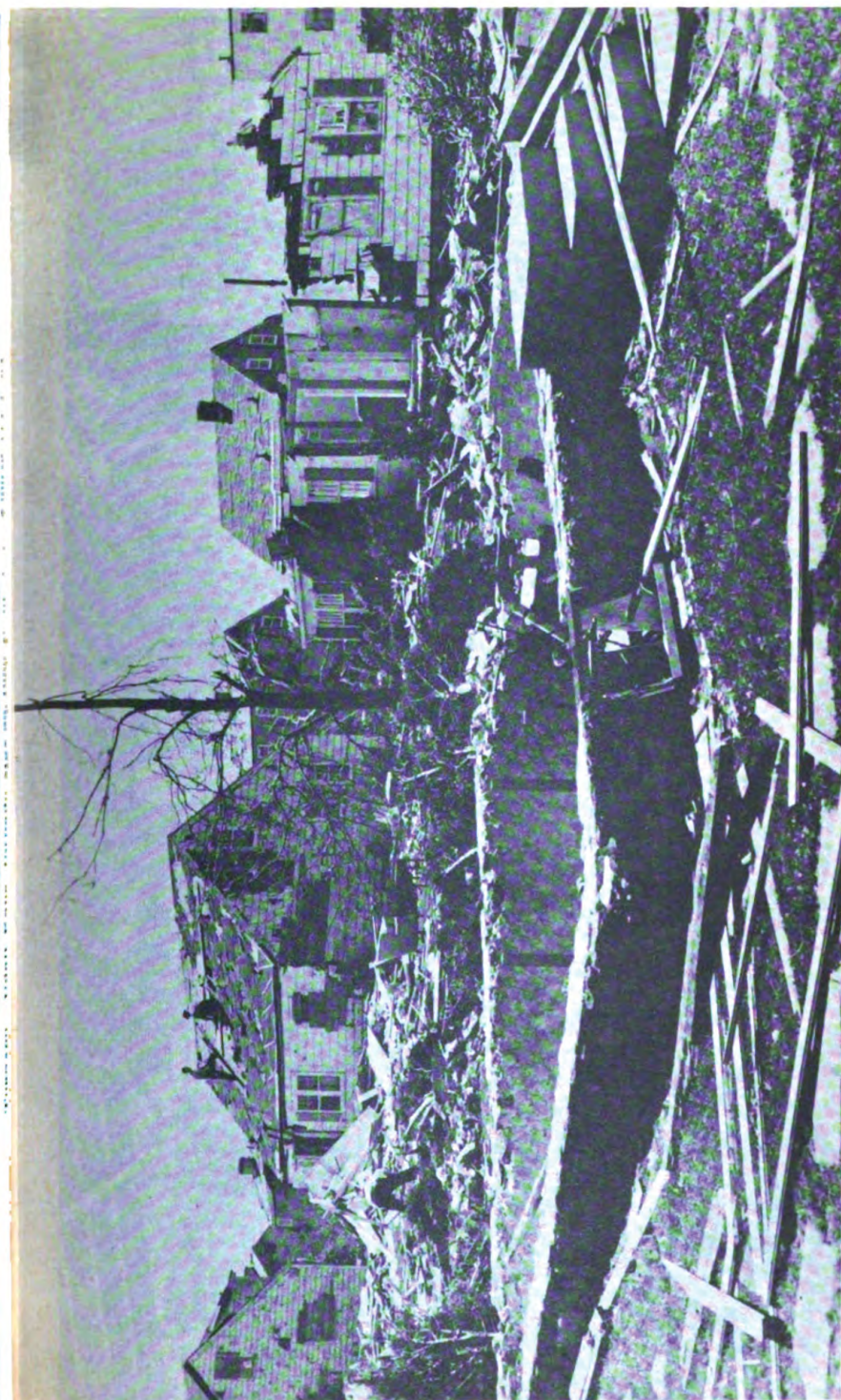
TORNADO.—Udall, Kans., tornado, May 25, 1955.

Carl J. Whitson,  
Winfield, Kans.,  
photo



Carl J. Whitson,  
Winfield, Kans.,  
photo

TORNADO.—Udall, Kans., tornado, May 25, 1955, front of new \$300,000 high school.



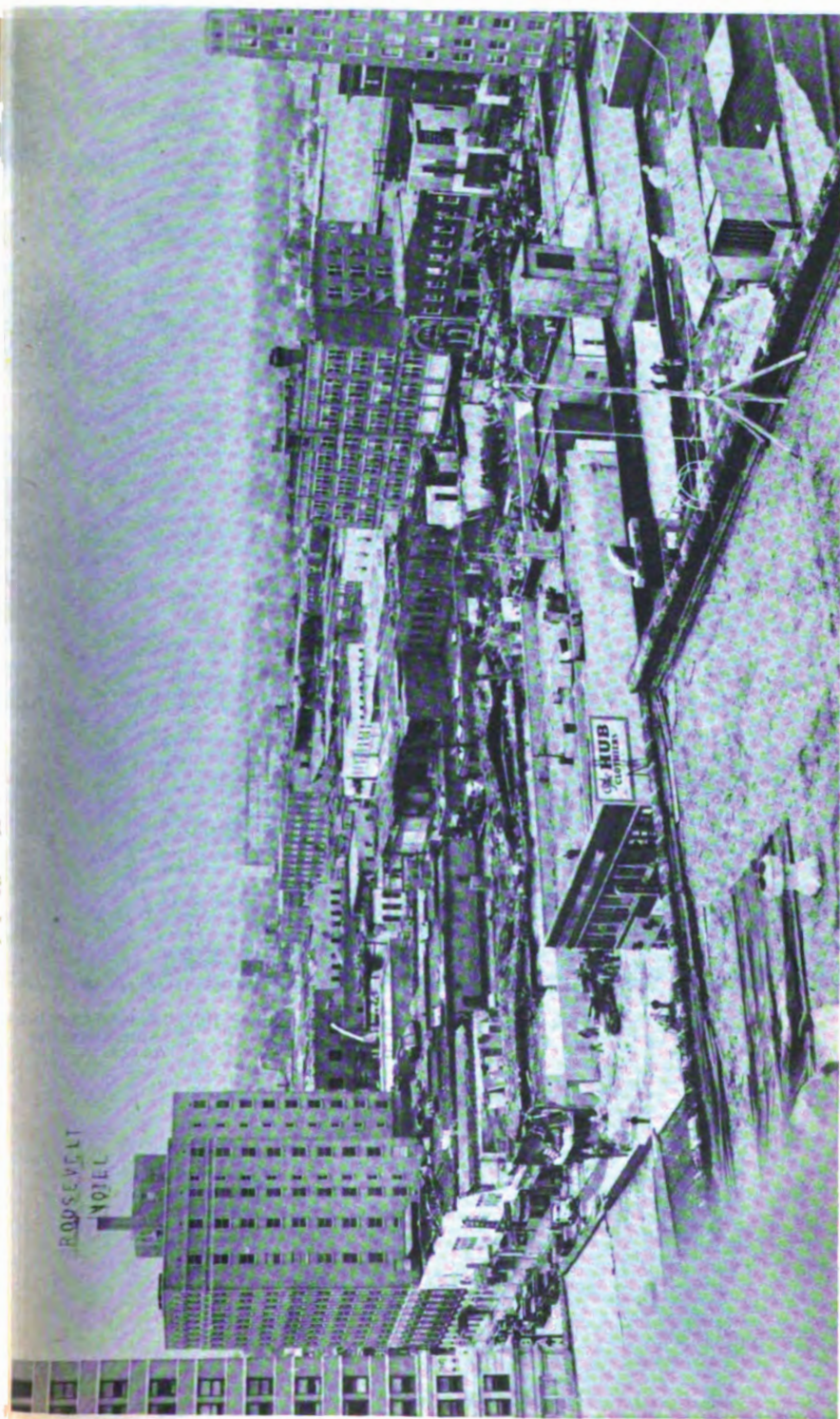
Marvin Richmond,  
Worcester, Mass.,  
photo

TORNADO.—Worcester, Mass., tornado, June 1953.



TORNADO.—Worcester, Mass., tornado, June 1953.

Marvin Richmond,  
Worcester, Mass.,  
photo



Windy Drum,  
Waco, Tex., photo

TORNADO.—Waco, Tex., tornado, downtown, May 1952.



**TORNADO.—Vicksburg, Miss., tornado, December 1953. Federal Civil Defense Administration photo**



**BLIZZARD.**—Passengers await transport to another train after rescue parties broke through to the snowbound "City of San Francisco" at Uba Gap, Calif. They were stranded 3½ days while rescue teams tried to get through a raging blizzard. January 16, 1952.

U. S. Army photo



## IV. STORMS

### HURRICANES AND OTHER TROPICAL STORMS

The term "tropical storm" is used generally to refer to a tropical cyclone, especially when the speed of the stormwinds is less than 75 miles per hour. When windspeeds exceed 75 miles an hour, general practice refers to the tropical cyclone of Atlantic or Caribbean origin as a hurricane. Tropical cyclones are intense rotational storms beginning over tropical ocean areas. Matured, it is nearly circular in shape and its rotating winds often exceed speeds of 100 miles per hour. The entire wind, cloud, and rain system revolves about the "eye of the storm" and moves as a unit at varying speeds, often for thousands of miles. Dominating the weather over thousands of square miles as it rages, the storm usually loses force gradually over land areas and finally dissipates or loses its violent tropical character as it moves into the higher northern latitudes. The eye is the core of the storm, like the hub of a wheel, about which the storm revolves. In the eye there is little or no rain, only light winds, little cloudiness, and the temperature is warm. The wall of the eye is its outer boundary formed by the main cloud mass of the cyclone and is marked by a sharp increase in wind speed. The diameter of the eye ranges from under five to tens of miles. The shape of the eye tends to be circular.

Table 33 shows the evil effects of tropical storms on the Southern and Eastern States of the United States during the current century. These meteorological disturbances form each year in the southern North Atlantic and Gulf of Mexico, usually in the late summer and early autumn. Many of them reach hurricane proportions. Even with less wind they often bring some destructive squalls and excessive rainfalls with them. In the last 56 years there have been at least 2 of these storms each year. In 1933 their occurrence reached a maximum of 21. Not all of them affect the United States. In fact, in some years none reach our coasts. Figures 18 and 19 list by 5-year periods the occurrence of tropical storms and the number that did reach the United States mainland during the years 1901-55. In the majority of years 2 to 4 tropical storms can be expected to give our shores a severe and often disastrous lashing. All of them are potentially major destroyers of property. A change of a few tens of miles in their tracks often makes the difference between an annoying nuisance and a major catastrophe.

TABLE 33.—*North Atlantic and gulf tropical storms, 1900–1955*

Year	Tropical storms		Tropical storms reaching the United States		Deaths in the United States from tropical storms	Estimated damage in the United States from tropical storms
	Hurricanes	Less than hurricane force	Hurricanes <sup>1</sup>	Less than hurricane force		
1900	3	2	2	2	6,000	\$20,000,000
1901	5	5	4	2	10	1,000,000
1902	3	1	3	0	( <sup>2</sup> )	1,000,000
1903	6	2	2	0	9	300,000
1904	2	7	2	3	16	( <sup>2</sup> )
1905	2	1	0	1	( <sup>2</sup> )	( <sup>2</sup> )
1906	6	3	4	1	260	3,480,000
1907	0	4	0	2	( <sup>2</sup> )	( <sup>2</sup> )
1908	3	3	0	2	( <sup>2</sup> )	( <sup>2</sup> )
1909	4	8	3	4	391	8,000,000
1910	2	2	2	0	( <sup>2</sup> )	( <sup>2</sup> )
1911	2	0	2	0	17	1,200,000
1912	5	3	3	3	( <sup>2</sup> )	37,000
1913	2	2	2	1	5	5,000,000
1914	0	2	0	2	( <sup>2</sup> )	( <sup>2</sup> )
1915	3	2	3	1	550	63,000,000
1916	7	6	4	4	107	33,324,000
1917	1	1	1	0	5	170,000
1918	2	2	1	0	34	5,000,000
1919	1	3	1	1	287	22,000,000
1920	2	2	2	1	2	3,000,000
1921	3	2	2	0	5	3,000,000
1922	3	2	0	2	( <sup>2</sup> )	( <sup>2</sup> )
1923	2	3	2	1	( <sup>2</sup> )	19,500
1924	4	4	2	1	2	( <sup>2</sup> )
1925	1	2	1	1	6	( <sup>2</sup> )
1926	7	3	3	0	269	106,500,000
1927	2	5	0	1	0	( <sup>2</sup> )
1928	3	3	1	2	1,836	25,000,000
1929	2	0	2	0	3	653,000
1930	1	1	1	0	0	( <sup>2</sup> )
1931	2	6	0	3	0	( <sup>2</sup> )
1932	6	5	1	4	( <sup>2</sup> )	( <sup>2</sup> )
1933	10	11	4	2	63	45,650,000
1934	5	6	2	2	17	4,760,000
1935	5	0	2	0	414	11,500,000
1936	5	12	3	4	9	2,300,000
1937	2	7	0	4	0	42,500
1938	4	4	2	2	600	300,245,000
1939	2	3	0	3	3	2,000
1940	4	4	2	1	51	4,743,500
1941	4	2	2	2	10	7,675,000
1942	2	6	1	2	8	27,101,000
1943	5	5	3	1	16	16,765,000
1944	6	4	3	1	64	165,010,000
1945	4	6	3	1	7	80,133,000
1946	2	4	2	2	0	5,200,000
1947	4	6	2	6	53	135,757,500
1948	5	5	3	2	3	18,400,000
1949	8	3	3	1	4	58,750,000
1950	11	1	3	1	19	35,850,000
1951	8	2	1	0	0	2,000,000
1952	6	0	1	0	3	2,750,000
1953	5	3	2	2	2	6,162,500
1954	6	2	4	1	193	755,472,500
1955 <sup>4</sup>	8	2	3	1	231	\$ 1,776,120,000

<sup>1</sup> Not all had maintained winds of hurricane force at the time of entering the continental United States.<sup>2</sup> No figure available; presumed to be very few or none.<sup>3</sup> Figures not available; damage usually minor.<sup>4</sup> Data for 1955 are for the period up to Sept. 28.<sup>5</sup> In part caused by floods from hurricane rains.

FIGURE 18

## TOTAL NUMBER OF TROPICAL STORMS

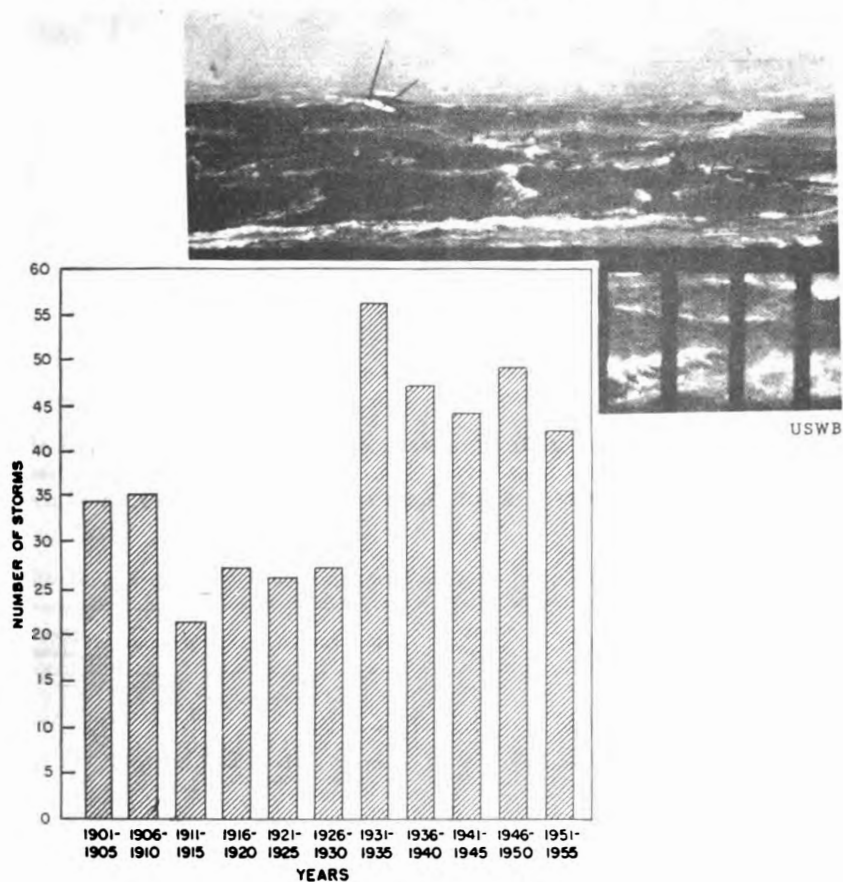
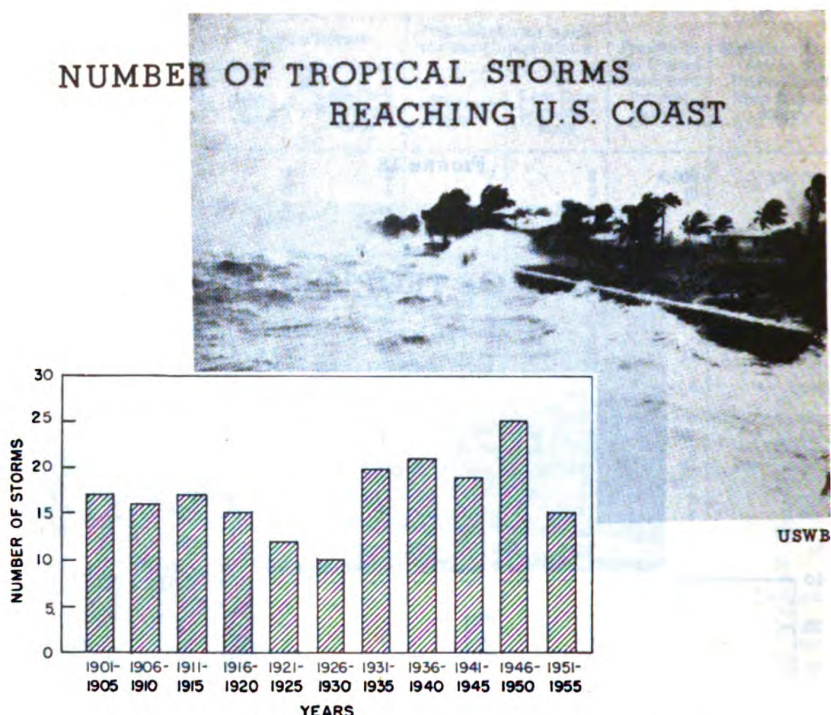


FIGURE 19



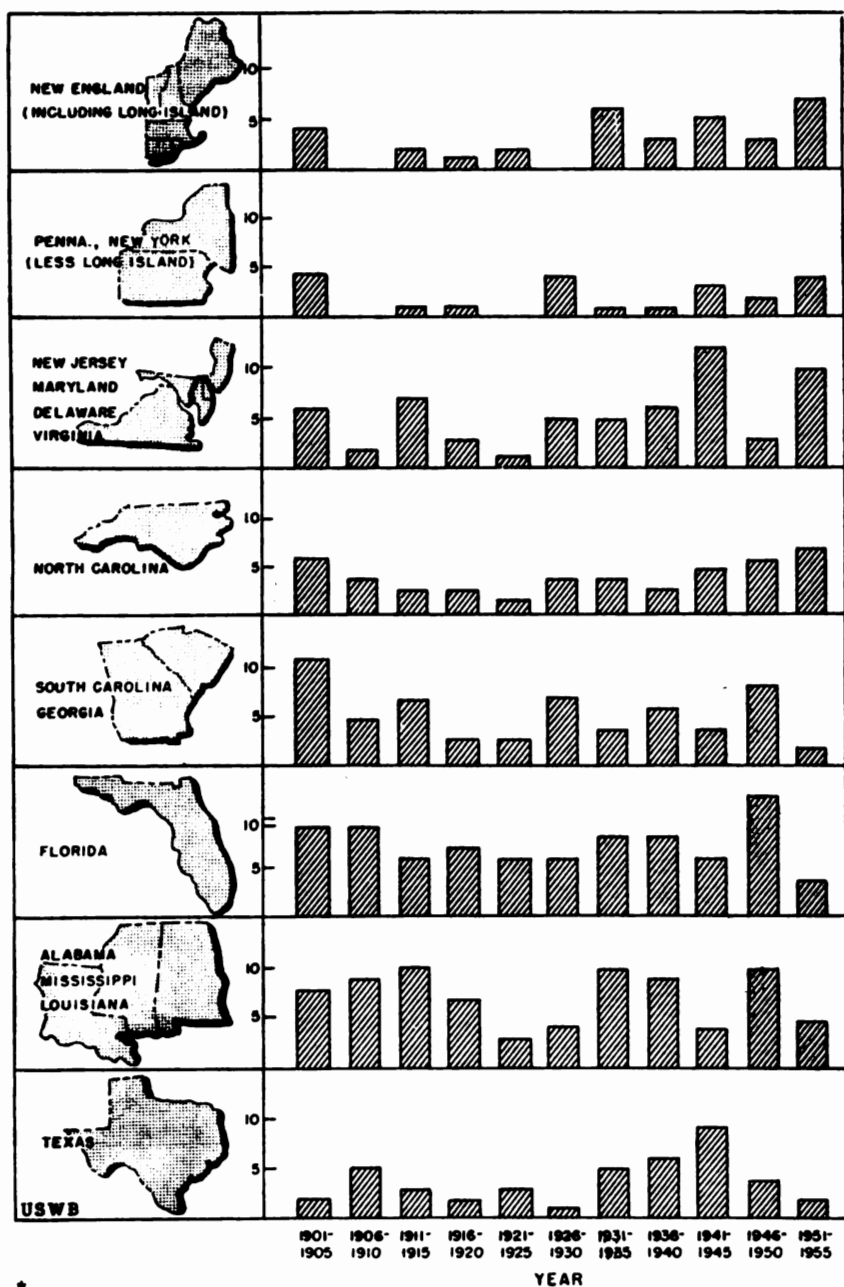
All of the States along the gulf and Atlantic coasts have had the eyes of tropical storms pass over them. Some of them have been affected more than others. A summary of these occurrences, by States, is shown in table 34.

TABLE 34.—*Passages of eye of tropical storms through coastal States, 1901-55*

States affected by tropical storms	Number of cases	States affected by tropical storms	Number of cases
Texas.....	42	Maryland-Delaware.....	23
Louisiana.....	26	New Jersey.....	13
Mississippi.....	23	Pennsylvania.....	12
Alabama.....	30	New York (less Long Island).....	9
Florida.....	81	Connecticut, Massachusetts, Rhode Island (and Long Island).....	21
Georgia.....	32	New Hampshire.....	6
South Carolina.....	28	Maine.....	7
North Carolina.....	44		
Virginia.....	25		

Figure 20 presents in more detail for 5-year periods during the years from 1901 to 1955 geographical areas in the United States through which eyes of tropical storms have passed. In many of these instances severe damages have resulted. Often the damage is not restricted to the immediate storm center alone. Torrential rains which often accompany these storms lead to floods. These may engulf vast areas which suffered no direct damages from gales at all. There is no persistent pattern or sequence in which various sectors of the coast

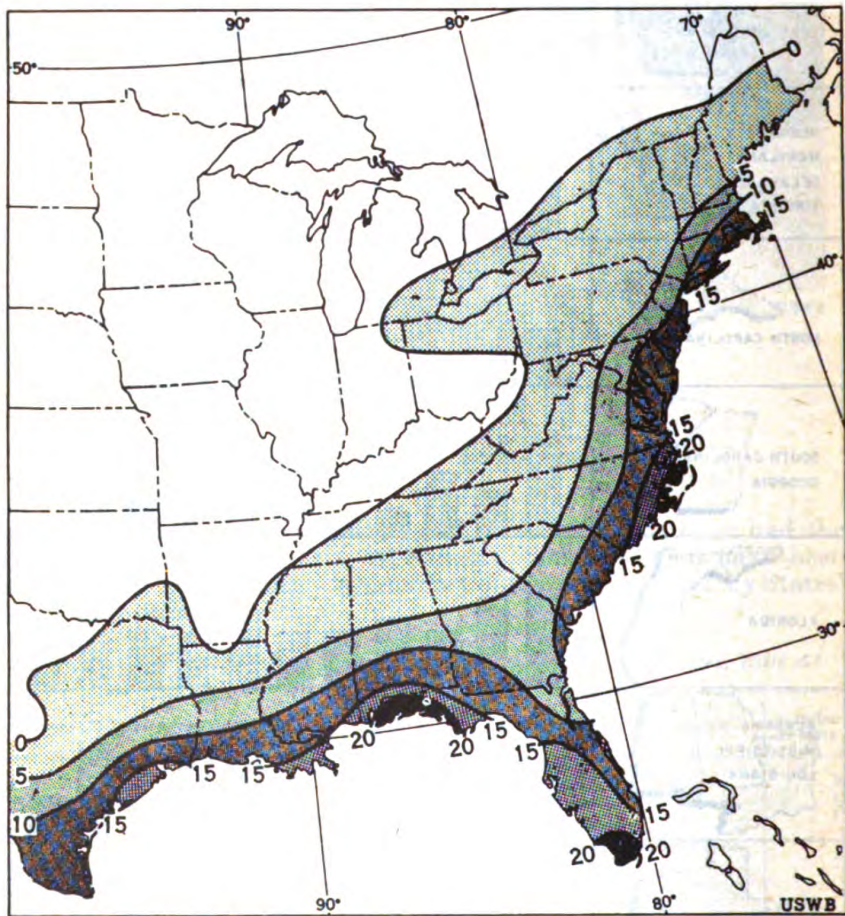
FIGURE 20. Number of tropical storm tracks (eye) passing through States.\*



\* Any one storm may affect several states

have been struck by tropical storms. In one decade the Gulf States are hit more than others. In another decade they are more prone to hit the South Atlantic States or New England. Much additional research work is needed to elucidate the cause for these fluctuations. Figure 21 shows the number of times destruction was caused by tropical storms on the United States mainland to date during the present century.

FIGURE 21. Number of times destruction was caused by tropical storms, 1901-1955.



#### PREDICTABILITY AND WARNING SERVICE

The forecasts and warnings of the Weather Bureau attempt to prevent casualties and reduce property damages. New methods of forecasting hurricanes, floods, and tornadoes have been introduced into the daily service in the past few years. Research for further improvements in weather forecasting is carried on by the Weather Bureau, by other Government agencies, and by private institutions. It is as tedious an uphill fight as any research program in the field of medicine.

Great progress has been made through the introduction of radar, which permits continuous tracking of storms.

Crews in hurricane hunter aircraft fight their way into the storms periodically to supply more frequent data on the nature of the cyclone, including the accompanying wind velocities, and the speed and course of movement of the storms. Armed with this information, Weather Bureau personnel are better able to track the storm with considerable accuracy. They possess far more detailed and frequent information about the development and attributes of the hurricane than was possible in earlier times when reliance had to be placed on much less frequent reports from vessels at sea and islands in the vicinity of the storm. It is understood that at present, aircraft reports on tropical storms cease when the storms pass over land areas. In view of the great destructive force of these storms and the desirability of placing in the hands of trained personnel all the data obtainable concerning their movement and behavior, it seems well worth the committee's attention to determine the reasons for lacking the service of hurricane hunters over land. Of recent memory is the unexpected swing made by Hurricane Diane after it had passed far inland in Virginia, with an accompanying deluge which brought disaster to several Middle Atlantic and New England States.

Recent years have seen an alert Weather Bureau conscientiously advising those who should be interested of the course and destructive capacity of tropical storms. A few voices have been raised in protest at the zeal with which Weather Bureau personnel undertake this task. This of itself evidences the widespread attention such weather advisories receive and the caution they engender.

But despite all the scientific knowledge presently available, Weather Bureau personnel experience considerable difficulty in forecasting the exact path of a hurricane. Like the personification of the feminine names they bear, hurricanes seem to exert a woman's prerogative of changing her mind. After progressing with almost clocklike regularity in its forward movement, a hurricane may slow down and hover over some area for a long period before resuming horizontal motion in any direction. At such times it becomes exceedingly uncertain just which path the storm will follow upon resuming its forward motion. For example, both Diane and Ione followed the same general forward route over the Caribbean. Both slowed down as they neared the mainland of the United States. Both finally smashed into the coastline near the common border of North and South Carolina. But Diane then continued in a general northerly direction inland to Virginia before sweeping northeasterly. By contrast, Ione followed a more northeasterly course after buffeting the North Carolina coast, slowed to a stop again in coastal Virginia near Norfolk, and then suddenly swung out to sea toward the Northeast, sparing mainland points north of Norfolk.

There is some informed opinion that believes further research, with all this necessitates along the lines of equipment and personnel, would enable the Weather Bureau to improve the accuracy of its forecasting service. The Congress last year authorized some movement in that direction.

The importance of timely warning of the approach of a hurricane is obvious. Such a warning can accomplish much to enable the saving of lives and property. It has been questioned whether the unfortunate severe loss of life and property suffered recently by our good

neighbor to the south, Mexico, was in part caused by inability to disseminate to those who could have profited by the warning, notice of the expected arrival of the offending hurricanes. In our own country, it is claimed that in recent years better communication facilities and the spreading of storm warnings by radio, television, and the press have prevented the need for using high casualty figures that once ran into thousands. Yet even this improvement has not rid this country of the problem of getting to those who should have it, information of impending approach of potential disaster. An advance warning received a few hours or even a few minutes before arrival of hurricane perils can do much to minimize the damage caused. But if the Weather Bureau first acquires the information necessary for issuance of such a warning late at night or in the very early hours of the morning, it has a difficult task in getting a warning to potential storm victims. At such a time, most radio and television stations have either ceased operations completely or enjoy a very small audience. Although Paul Revere's method of warning the countryside may hardly be adequate for this day and age, it may point the way for adaptation into a house-to-house warning spread by alerted and well-organized civil-defense workers. Some consideration has been given to dissemination of warnings by civil-defense sirens, police sirens or general telephone calls. The problem presented is first, to find a distinctive warning signal not confused with other similar signals in common use or reserved for special use, and second, to find trained persons available in adequate numbers to carry out the warning duties. This is a problem worthy of careful consideration.

Current practice followed by the Weather Bureau in its hurricane warning service falls into this pattern. When a hurricane is in progress, official numbered advisories are issued at least every 6 hours describing the storm and its expected movement. As the storm nears the mainland, more frequent public bulletins are issued, usually at 2 or 3 hourly intervals.

Types of warnings issued are as follows:

*Small craft advice.*—Small craft are advised to remain in port when wind or sea conditions associated with the hurricane are such as to seriously hamper safe operation of small boats.

*Hurricane alert.*—Issued when the hurricane reaches a position so that hurricane winds may endanger a portion of the mainland within 36 hours. This means no immediate danger but everyone should stand by for further reports and be ready to take precautionary action if necessary.

*Storm warnings.*—Issued if the storm moves closer to land so that winds and tides will become dangerous. Normally, storm warnings are issued 24 hours before dangerous conditions are expected to occur. Storm warnings generally indicate that winds of Beaufort Force 6 (32 miles per hour) or higher are expected.

*Hurricane warnings.*—Issued up to 24 hours before hurricane-force winds (75 miles per hour) are expected to influence a coastal area. This warning means that all precautions should be taken immediately against the full force of the storm.

Such predictions prove useful in reducing threatened damage.

Protective actions to reduce damage to property include the following:

- (a) Board up windows or use storm shutters.
- (b) Airplanes may be flown out of the area of danger.

(c) Move small boats ashore, take to protective anchorage, or tie down securely against strong winds and heavy seas.

(d) Remove porch furniture, garden tools, awnings, etc., so that loose objects are stored safely indoors.

(e) Park automobiles in protected garages or on high ground not subject to flooding. If possible, cars should be parked away from trees, telephone poles, or other structures that may blow over.

(f) Livestock should be brought indoors or moved to protected locations.

(g) Where feasible, mature or near-mature crops may be harvested early.

(h) Extra maintenance crews can be alerted for duty to maintain services and repair minor damages before emergencies arise in such fields as communications, transportation, etc.

(i) Emergency power and refrigeration facilities may be checked so they are available for use if needed.

(j) Open floodgates in dams and reservoirs to lower the level of the water and produce protected space in which hurricane rains may gather and be contained when gates are closed.

(k) Draw into protected containers water for drinking, cooking, and bathing purposes as well as for other general uses.

#### DAMAGE

The severe damage resulting from tropical storms and hurricanes in the United States is readily ascertained from the data presented in the columns headed "Deaths in the United States From Tropical Storms" and "Estimated Damage in the United States From Tropical Storms" in table 33. Notable is the fact that in the last 15 years, the number of deaths caused by such storms has decreased compared with earlier years. From 1941 to September 28, 1955, the death rate averaged about 40 per year, and in no single year, fortunately, during that period has the death toll reached the catastrophic rate of 1938 (600), 1935 (414), 1928 (1,836), 1915 (550), or 1900 (6,000). More adequate warning service can in part be credited for this development. On the other hand, property damage has tended to rise in terms of cost during the recent years as compared with the earlier part of the century, despite improvements in warning services. This can undoubtedly be explained by the increase in value of property lying in the paths of these tropical storms. Neither of these trends necessarily bears any relation to the fury of the tropical storms. As in the case of flood damage, the statistics indicate total tropical storm damage in any particular year may greatly exceed or be far less than the century average. Particularly startling is the indication that the approximately \$755½ million damage from such storms in 1954 was far more costly than in any preceding year of this century, yet the period from January 1 to September 28, 1955, topped the 1954 damage by more than \$1 billion.

#### TORNADOES

The small but often even more vicious little brother of the tropical storm is the tornado. Its life history is usually short, measured in minutes or hours. In that brief interval it may act like a giant bulldozer, flattening whole settlements and snuffing out lives indiscriminately.

Every State in the Union and even the small District of Columbia has experienced tornadoes. They are a particular scourge in the Great Plains States where each year brings hundreds of these twisters. In terms of the number of lives lost they often match the hurricanes. Property damage equally runs into millions of dollars each year.

Table 35 shows cumulative statistics for the number of observed tornadoes, by States, during the last 40 years, and the deaths and damages caused by them. On a countrywide basis the same information is given for each year in this interval in table 36. A look at this last table might give the impression that the number of tornadoes has spectacularly increased in the last few years. Actually, the table rather reflects two other elements. One is the increased density of population and the other represents the continuing efforts of the Weather Bureau to improve its collection of information on these small storms. In the early days the reporting system only caught the major and more spectacular cases. Now an effort is made to obtain information on all tornado occurrences. Again, the damage figures are secondhand unadjusted information.

TABLE 35.—*Summary of tornado occurrences for years 1916 through July 1955*

State	Number of tornadoes	Deaths	Total damage
Alabama.....	243	740	\$23, 175, 000
Arizona.....	17	0	10, 600
Arkansas.....	398	979	26, 262, 300
California.....	27	0	2, 004, 900
Colorado.....	106	27	2, 622, 700
Connecticut.....	13	0	322, 000
Delaware.....	6	0	223, 500
District of Columbia.....	4	0	301, 600
Florida.....	293	33	2, 664, 900
Georgia.....	232	546	70, 850, 500
Idaho.....	11	2	34, 500
Illinois.....	199	918	55, 178, 700
Indiana.....	183	257	28, 977, 400
Iowa.....	563	89	32, 813, 300
Kansas.....	1, 047	244	27, 768, 300
Kentucky.....	56	180	8, 635, 700
Louisiana.....	234	320	16, 189, 900
Maine.....	12	1	74, 300
Maryland.....	56	30	2, 457, 400
Massachusetts.....	28	95	54, 530, 500
Michigan.....	141	150	35, 789, 800
Minnesota.....	169	177	28, 283, 300
Mississippi.....	269	850	46, 358, 600
Missouri.....	357	479	50, 534, 300
Montana.....	71	5	1, 625, 300
Nebraska.....	316	90	12, 295, 500
Nevada.....	6	0	100
New Hampshire.....	11	1	456, 100
New Jersey.....	16	2	1, 690, 500
New Mexico.....	47	5	369, 200
New York.....	25	5	6, 274, 200
North Carolina.....	94	51	6, 055, 800
North Dakota.....	104	44	2, 762, 100
Ohio.....	142	175	50, 045, 800
Oklahoma.....	735	697	65, 631, 700
Oregon.....	7	0	15, 200
Pennsylvania.....	128	63	8, 944, 400
Rhode Island.....	2	0	4, 500
South Carolina.....	133	190	9, 271, 000
South Dakota.....	161	19	4, 022, 500
Tennessee.....	178	363	24, 877, 100
Texas.....	841	806	93, 594, 700
Utah.....	8	0	18, 200
Vermont.....	8	0	35, 300
Virginia.....	62	35	2, 798, 500
Washington.....	6	0	17, 300
West Virginia.....	13	110	2, 588, 700
Wisconsin.....	158	118	14, 379, 500
Wyoming.....	73	3	610, 500
Total.....	{ 8, 009 17, 770 }	8, 899	824, 438, 100

1 Corrected for boundary-crossing tornadoes.



## Tornado Tracks 1916-1950

- LEGEND
- Tornado Track.
  - Location of Tornado
  - Track too Short to Indicate.

TABLE 36.—Number of tornadoes, tornado days, and resulting losses by years, 1916 to July 1955

Year	Number reported	Number tornado days	Total loss of life	Most deaths in a single tornado	Total reported property losses	Number of tornadoes causing losses of—	
						\$100,000	\$1,000,000
1916	90	36	150	30	\$2,264,500	6	1
1917	121	38	509	101	15,007,700	22	5
1918	81	45	135	36	7,431,150	19	1
1919	65	35	206	59	6,861,500	9	2
1920	87	49	498	87	15,007,500	24	7
1921	106	55	202	61	5,456,300	13	1
1922	108	65	135	16	6,880,000	20	0
1923	102	59	109	23	2,968,725	8	0
1924	130	88	376	85	26,072,350	25	6
1925	119	64	794	669	24,039,900	29	1
1926	111	56	144	23	4,323,950	16	0
1927	164	63	540	92	43,455,650	28	7
1928	203	79	92	14	13,235,600	25	4
1929	197	73	274	40	10,112,400	30	1
1930	192	72	179	41	12,289,100	28	3
1931	94	57	36	6	3,215,900	7	1
1932	182	67	394	37	8,888,525	11	1
1933	260	96	362	34	16,190,640	31	5
1934	147	77	47	6	4,424,950	9	0
1935	182	77	70	11	4,661,430	15	0
1936	159	73	552	216	26,228,550	17	6
1937	148	74	29	5	3,155,875	11	0
1938	220	78	183	32	8,793,457	18	3
1939	155	75	87	27	5,891,930	10	2
1940	128	65	65	18	6,015,320	9	1
1941	118	57	53	25	4,492,650	15	0
1942	170	68	384	65	15,268,950	32	3
1943	155	63	58	5	12,196,400	25	4
1944	173	67	275	100	21,594,150	34	7
1945	126	68	210	69	22,069,800	25	8
1946	109	66	78	15	12,267,015	31	3
1947	171	80	313	169	23,994,680	42	5
1948	190	74	140	33	40,699,650	53	6
1949	262	84	212	58	27,367,380	45	7
1950	210	92	70	18	13,637,300	31	1
1951	300	119	34	6	29,484,275	27	7
1952	270	104	230	57	35,193,900	48	10
1953	532	151	516	116	224,345,900	43	15
1954	690	177	35	6	28,367,400	41	3
1955 (to July)	775	126	123	-----	30,583,200	-----	-----

Through July, preliminary figures.

The countrywide distribution of tornadoes can best be visualized from the accompanying map (figure 22) which shows the tracks of all tornadoes recorded in Weather Bureau files.

#### WARNING SERVICE

When weather conditions indicate that tornadoes are likely to occur the Weather Bureau issues official tornado forecasts which are given wide public distribution in the designated area. When a tornado has been reported or severe local storm activity develops, tornado warnings are flashed to the public over all available communications channels.

Types of warnings given are as follows:

**Tornado forecasts.**—Define a specific area, usually about 10,000 square miles, in which one or more tornadoes may develop during the following 6 to 8 hours. A tornado forecast serves as a public alert advising people to watch local weather conditions for the possible development of a tornado.

*Tornado warnings.*—State that a tornado has formed at a particular spot and describe the likely path it will take, with times of arrival at other locations. The public is advised to take all possible precautions.

The following use of predictions can be made to reduce damages.

Due to relatively large area covered by a tornado forecast and the relatively small area affected by any one tornado, it is usually impracticable to attempt precautionary measures for the protection of property on the basis of a tornado forecast. When a tornado warning is issued, persons in the expected path of the storm may take the following steps to reduce property losses:

(a) In buildings (homes, factories, etc.) power and fuel lines can be turned off to avoid fires and explosions.

(b) Loose objects can be secured or brought indoors.

### WINTER STORMS

The tropical storms are mostly summer and fall phenomena. The tornadoes, especially in the central plains, show their maximum occurrence in the spring months from March through June. In the winter the country is afflicted mostly by blizzards, glaze storms, and excessive snowfall. These occur naturally most often in the northern tier of States. The South is generally spared the more severe aspects of winter weather but often widespread damages occur by some unusual invasions of subfreezing temperatures. These may wipe out crops and even kill the trees and orchards. These weather disasters of winter are by no means uncommon. Table 37 shows their frequency by States for the last 40 years. All the instances listed there caused major damages and usually fatalities. Also listed in this table are disastrous dust storms noted in the same period.

TABLE 37.—Major damaging storms other than tornadoes and hurricanes, 1916 to March 1955—Number of occurrences by States

State	Glaze	Freeze	Blizzard	Snow	Dust	Snowslide
1. Alabama.....	1	1	—	—	—	—
2. Arizona.....	—	1	—	—	—	—
3. Arkansas.....	4	1	—	1	—	—
4. California.....	—	3	—	—	—	—
5. Colorado.....	1	1	3	4	5	1
6. Connecticut.....	1	—	—	1	—	1
7. Delaware.....	—	—	—	—	—	—
8. District of Columbia.....	1	—	—	—	—	—
9. Florida.....	—	5	—	—	—	—
10. Georgia.....	3	1	—	—	—	—
11. Idaho.....	1	1	—	1	—	—
12. Illinois.....	15	—	1	5	—	—
13. Indiana.....	10	—	—	3	—	—
14. Iowa.....	17	—	3	6	—	—
15. Kansas.....	6	—	2	2	1	—
16. Kentucky.....	3	—	—	1	—	—
17. Louisiana.....	3	4	—	—	—	—
18. Maine.....	1	—	—	3	—	—
19. Maryland.....	1	—	—	4	—	—
20. Massachusetts.....	1	—	—	4	—	—
21. Michigan.....	9	—	2	7	—	—
22. Minnesota.....	22	—	3	2	—	—
23. Mississippi.....	4	2	—	—	—	—
24. Missouri.....	8	—	2	3	—	—
25. Montana.....	—	—	7	2	1	—
26. Nebraska.....	13	—	4	2	—	—
27. Nevada.....	—	—	—	—	—	—
28. New Hampshire.....	—	—	—	3	—	—
29. New Jersey.....	4	—	—	1	—	—
30. New Mexico.....	—	1	—	2	—	—
31. New York.....	12	1	2	9	—	—
32. North Carolina.....	4	1	—	1	—	—
33. North Dakota.....	1	—	3	—	1	—
34. Ohio.....	7	4	—	2	—	—
35. Oklahoma.....	4	—	1	—	1	—
36. Oregon.....	9	—	2	—	—	—
37. Pennsylvania.....	4	2	—	3	—	—
38. Rhode Island.....	1	—	—	—	—	—
39. South Carolina.....	2	1	—	—	—	—
40. South Dakota.....	5	—	10	5	1	—
41. Tennessee.....	7	—	—	1	—	—
42. Texas.....	11	2	1	1	1	—
43. Utah.....	—	1	—	1	—	1
44. Vermont.....	—	—	—	1	—	—
45. Virginia.....	3	2	1	3	—	—
46. Washington.....	3	—	1	2	—	—
47. West Virginia.....	—	1	—	3	—	—
48. Wisconsin.....	8	—	5	7	—	—
49. Wyoming.....	2	—	3	3	—	—

*Severe freezes.*—Warning service: When a severe cold wave or freeze is expected, warnings are issued to the public from 12 to 24 hours in advance. These warnings are distributed to the public by all commercial news dissemination agencies and by Federal, State, and local governmental groups cooperating with the Weather Bureau.

Types of warnings given are as follows:

*Severe cold wave.*—This warning is issued for a geographical area consisting of part of a State, one State, or several States and gives advance notice to the public that extremely low temperatures will occur within the next 12 to 24 hours.

Use of predictions can be made to reduce damages as follows:

Protective measures include—

(a) Putting antifreeze in motor vehicles to protect against the predicted low temperature.

(b) Securing sufficient fuel supplies to maintain safe temperatures in buildings, factories, etc.

(c) Calling out extra maintenance personnel to handle heating apparatus.

(d) Rushing harvesting of crops if feasible.

(e) Protecting food supplies and other items in transit against damaging low temperatures.

(f) Bringing livestock into shelters.

(g) Making arrangements for availability of sufficient quantities of water for consumption by humans and animals during cold period.

*Heavy snowstorms.*—Warning service: Heavy snow warnings are issued to advise the public that heavy snowfall is likely to occur in a given area so that protective measures may be taken.

Type of warnings given are as follows:

Issued for a part of a State, a whole State, or several States 12 to 18 hours before heavy snowfall is expected to occur. The definition of heavy snowfall for warning purposes varies and is dependent on the area of the country for which the warning is issued. Heavy snow warnings are widely disseminated over the same channels used for severe cold-wave warnings.

Use of predictions to reduce damages can be made as follows:

Protective measures include the following—

(a) Remove to indoor shelter items which may be damaged or destroyed by heavy snow accumulations.

(b) Emergency feed for livestock may be obtained. If livestock are on open range these supplies can be stockpiled near their grazing area.

(c) Maintenance crews for transportation industry can be alerted and made available to keep snow plows, etc., in operation.

*Blizzards.*—Warning service: Blizzard warnings are issued when the combined effects of low temperatures, snow, and strong winds are expected to cause extremely hazardous conditions.

Types of warnings are as follows:

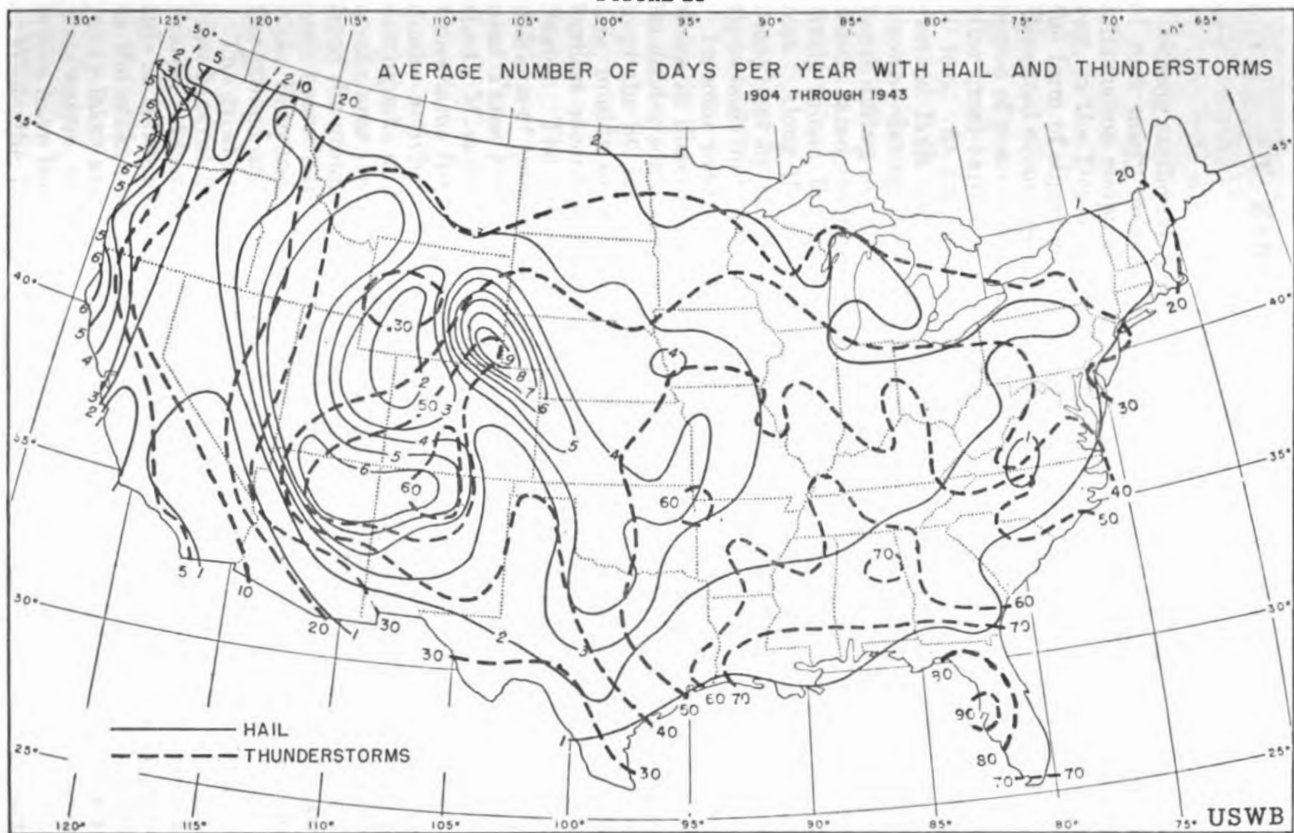
Issued from approximately 6 to 12 hours before blizzard conditions are expected to occur over a part of 1 State, a whole State, or several States. Blizzard warnings receive essentially the same distribution as severe cold-wave warnings.

Use of predictions can be made to reduce damages by taking protective action similar to that taken for severe cold waves and heavy snow.

#### THUNDERSTORMS AND HAIL

There are other types of damaging storms. Most of them are very localized and, generally speaking, the damages are not formidable in each instance. However, cumulatively they reach considerable values for the country as a whole. We are referring here to the thunderstorms and hailstorms. These are not necessarily mutually exclusive. In certain seasons many thunderstorms contain hail and, occasionally, hail may occur without accompanying electrical phenomena. As noted in figure 23, there is considerable difference in frequency of these storm types over the country. Thunderstorms are quite common in the Southeastern States and are very rarely observed near the Pacific coast. Hailstorms are a considerable risk in the Middle West and Great Plains and least frequent on the west coast and in the Northeast. Although, as stated before, these storms rarely affect whole communities, to the individual householder or farmer they may well represent a disastrous calamity. For electric utilities and communication networks damages caused by thunderstorms represent sizable amounts annually. In the public domain losses from forest fires ignited by lightning also run into high figures each year.

FIGURE 23





## V. EARTHQUAKES AND VOLCANOES

### EARTHQUAKES

Strong earthquakes are usually due to the rupturing of great masses of rock many miles beneath the surface of the earth, according to information supplied by the United States Coast and Geodetic Survey, in the Department of Commerce. This action generally takes the form of slipping or sliding along a ruptured plane, called a fault. Repeated occurrence of earthquakes along the same fault over a long period of years is not unusual. Observations of ground displacements after great earthquakes indicate these fault slips may be as much as 50 feet. At one point along the shore of Yakutat Bay in Alaska a vertical fault slip of 49 feet occurred—one of the largest actually known—during the 1899 earthquake in that vicinity. On the other hand, during the destructive California earthquake of April 18, 1906, which razed most of San Francisco, vertical slipping was comparatively minor, but horizontal slipping amounted to a maximum of 21 feet. Along the fault fences and roads were sheared and separated many feet by the irresistible force of the earth's movement. Structures built on the fault were wrenched and ruined.

In some seismic areas, such as Japan, great blocks of rock, tens of miles in dimension, undergo tilting. On the earth's surface, great landslides sometimes develop due to earthquake. Such occurrences kept the St. Lawrence River between Montreal and Quebec in Canada, muddy for a month following the 1663 earthquake, which is the earliest recorded quake of destructive intensity felt in the United States. The 1887 earthquake in the State of Sonora, Mexico, threw millions of cubic feet of rock down the mountains. The 1925 shocks near Three Forks, Mont., caused landslides blocking the main line of the C. M. & St. Paul Railroad for many days. Sand and water sometimes issue from cracks and craters formed in the ground by earthquake activity. This phenomenon was noted at the 1887 Sonora earthquake and the 1886 Charleston, S. C., quake. During the 1931 quake near Great Bend, Tex., large quantities of water were emitted from the ground. In 1895 a lake formed over 4 acres of ground that sank near Charleston, Mo., following an earthquake felt in 23 States. Near Bertrand, Mo., during that earthquake sand was ejected from the ground and the water table was apparently raised.

The greatest earthquake experienced in this country centered near New Madrid, Mo., in 1811, and was felt over two-thirds of the United States. A lasting result was the lowering of a large part of the countryside in southeastern Missouri and northeastern Arkansas now known as the sunken country. In flood times this sunken country, with its many lakes and bayous, has served as a temporary reservoir for the floodwaters of the Mississippi River. In recent years, however, levees have been built and the land has been cultivated.

While the foregoing are the observable surface results of earthquakes, much indirect damage results from disasters accompanying them. We have noted previously in this study that some submarine earthquakes give rise to destructive tidal waves. In terms of value, the fires caused by the 1906 earthquake in San Francisco are estimated

to have caused between 15 and 20 times as much damage as did the quake itself.

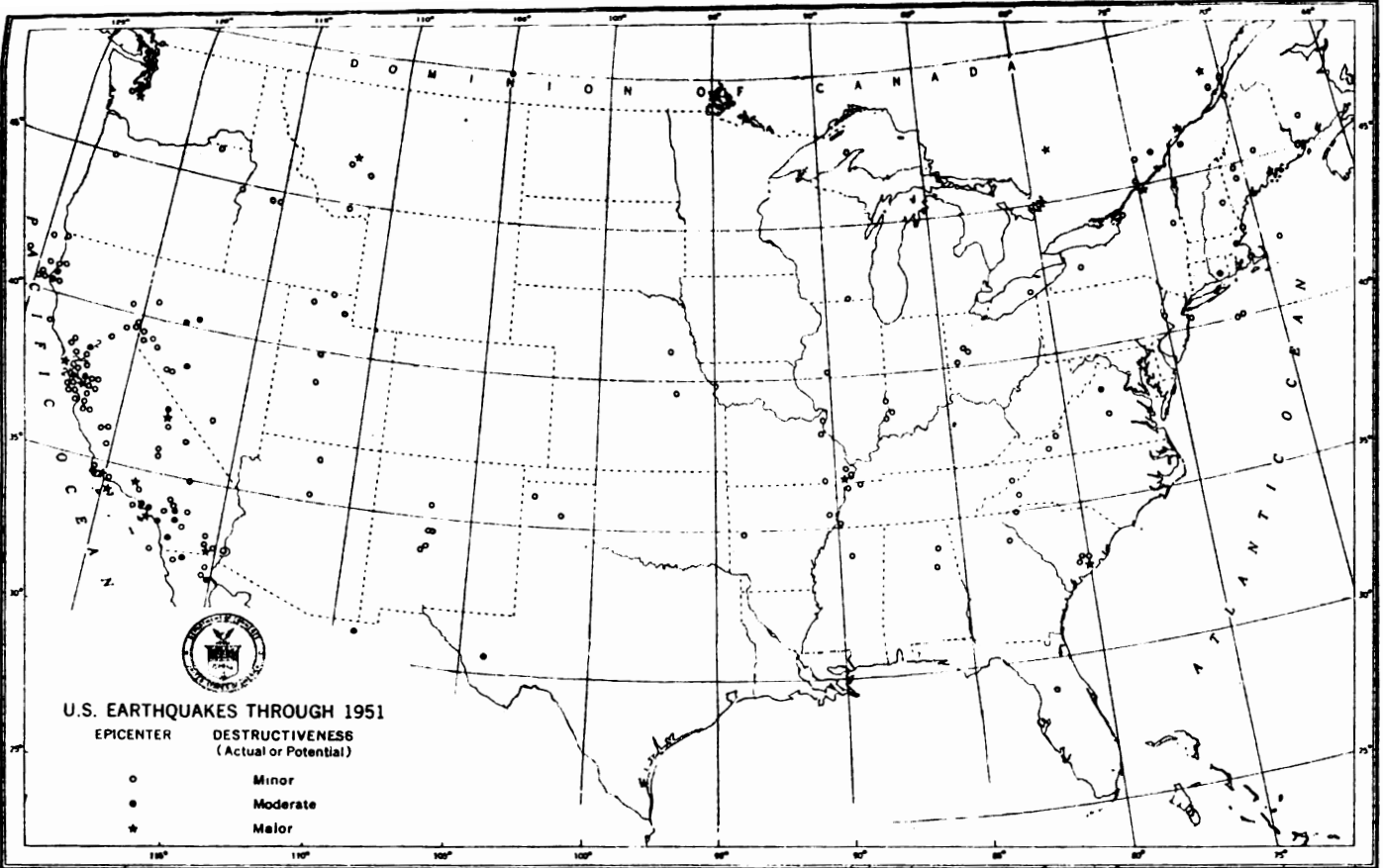
As is the case with floods, the layman is apt to consider an earthquake as evidence of abnormal behavior on the part of nature, while the scientist recognizes it as a routine manifestation of natural law. The Coast and Geodetic Survey notes it is estimated that more than 1 million earthquakes occur in the world annually, ranging from minor to catastrophic. About 700 per year may be classified as strong, that is, capable of causing considerable damage in areas where they occur. Most earthquakes originate under the sea, and cause little concern except when seismic sea waves result.

The ultimate cause of the continual adjustment of rock in the earth's crust is thought to be due to a slow, relentless flow or creeping of the underlying ultrabasic rock persisting throughout geological ages. Like paraffin, the rocks change shape without fracturing if the distorting forces are applied slowly and steadily, but the same rocks will crack if the forces are applied too quickly. The cause of this rock flow is variously attributed to cooling of the earth, convection currents set up by radioactivity in the deeper rocks, changing surface loads due to the transfer of material by erosion or deposition, and other causes. The Survey notes these are largely matters of conjecture.

The vast majority of so-called shallow earthquakes begin at depths of 10 to 20 miles, but some are deeper, extending to a maximum depth of 450 miles. Earthquakes due to volcanic activity often seem violent locally, but they are neither very deep nor are they felt at great distances. In fact, they are superficial compared with tectonic (pertaining to the earth's crust) earthquakes frequently registered on instruments all over the world. The greater violence associated with Pacific Coast and Rocky Mountain earthquakes as compared to those in the eastern United States is generally attributed to their shallower foci. Most major rock fractures in California seem to be only 10 or 15 miles deep. In other areas this distance may be doubled or tripled, causing less violent motion at the surface of the earth. A great earthquake is seldom felt more than 1,000 miles from its epicenter.

The most disconcerting feature of a destructive earthquake is the repeated occurrence of aftershocks. These fill people with a hopeless sense of insecurity. Victims should realize aftershocks follow all major earthquakes and may continue at times for months, albeit with decreasing frequency and violence. While some aftershocks are quite sharp, they seldom reach the intensity of the main shock. They usually center at various points in the epicentral area, sometimes 15 miles or more from the source of the main shock.

The major seismic belts in the United States where destructive earthquakes have occurred are concentrated along the San Andreas Fault, Calif., the St. Lawrence River Valley, and the confluence of the Mississippi and Missouri Rivers. Other scattered areas having experienced destructive earthquakes are Charleston, S. C.; Helena, Mont.; Puget Sound, Wash., and western Nevada. In general, there is not a State in this country entirely free of earthquakes, but for the most part, other than the active belts, the activity is very minor. Two-thirds of the seismic action in the United States occurs on the Pacific coast and in Nevada. The Pacific coast in the United States forms part of the world's greatest earthquake belt rimming the Pacific Ocean. Figure 24 shows the incidence of earthquakes in the United States and nearby border points up to 1952.



In California, along the San Andreas Fault and other fault systems, there have been 5 outstanding and 11 great earthquakes since the early 17th century. Among the outstanding earthquakes are the Santa Barbara Ventura of 1812, the one in 1838 near San Francisco, the northwest Los Angeles County in 1857, the Owens Valley in 1872, and the San Francisco in 1906. The great earthquakes were 2 along the Hayward's Fault, 2 submarine off the northern coast of California, 2 in Nevada, and 1 each in Los Angeles, Owens Valley, Lower California, Imperial Valley, and Kern County. Most of these spent their violence in isolated areas. Even San Francisco was sparsely settled in 1838.

Most notable of these was the April 18, 1906, California quake that resulted from a base rock readjustment along the San Andreas Fault, which stretches on land from Imperial Valley northwesterly to the Golden Gate.

Other notable California-Nevada earthquakes are as follows: In 1868 a slip along the Hayward Fault damaged nearly every Hayward building and many in San Francisco. Serious quakes also hit Lone Pine in Owens Valley in 1872, Vacaville in 1892, San Jacinto and Hemet in 1899 and 1912, and Inglewood in 1920. A fault slip in mountains north of Santa Barbara in 1925 caused severe damage in that city. Other damaging earthquakes struck near Long Beach in 1922, Imperial in 1940 (with a horizontal fault movement of 15 feet), Santa Barbara again on June 30, 1941, Torrance-Gardena on November 14, 1941, and Terminal Island in San Pedro Bay in 1949. A slip along somewhat obscure White Wolf Fault on July 21, 1952, caused the strongest California earthquake since 1906 south of Bakersfield, harming Arbin and Tehachapi as well. On August 22, 1952, Bakersfield had a strong aftershock.

Along the St. Lawrence Valley the most destructive shock on this side of the border was on September 5, 1944, near Massena, N. Y., causing damage in United States and Canada. The other major shocks were in Canada between Quebec and Montreal in 1663, and near Tamiskaming on November 1, 1935. The latter shook most of the Northeastern United States. A less severe earthquake in the St. Lawrence Valley in 1870 was felt as far south as Virginia. Various parts of New England have felt moderate to severe quakes, some damaging houses (especially chimneys). The most severe in the New England area centered near Cambridge, Mass., in 1775, twisting chimneys and wrecking roofs. In 1791 strong shocks were felt near East Haddam, Conn., and for years this area was noted for subterranean noises of seismic origin. On November 18, 1939, all New England was shaken by a strong undersea earthquake off the Grand Banks. On August 10, 1884, an earthquake apparently occurring near the edge of the Continental Shelf off the mouth of the Hudson River shook the coast from Richmond, Va., to Portland, Maine, affecting inland areas as far as northwestern Pennsylvania. Northeast New York's lake region has had several earth shocks strong enough to damage chimneys. In Attica, N. Y., on August 12, 1929, a shock knocked down 250 chimneys. In 1897 a strong shock cracked brick houses and chimneys in Giles County, Va., and was felt from Indiana to Georgia. Other Eastern States have experienced weak shocks with no appreciable damage with the exception of South Carolina, where, on August 31, 1886, the greatest shock in the East was felt, causing severe property damage and death. It was also felt in Chicago and Boston.

The greatest earthquake experienced in this country (one of the 20 great earthquakes of known history) centered near New Madrid, Mo., in 1811, and was felt over two-thirds of the United States. As previously noted lasting effects of this shock are evidenced in the "sunken country" of southeastern Missouri and northeastern Arkansas, and in the same general area in 1843 and 1895 shocks occurred, the latter forming a lake of 4 acres near Charleston, Mo., being felt in 23 States.

Southwestern Indiana is a center of moderate earthquake activity. Central west Ohio has had five strong shocks since 1875, resulting in cracked walls and toppled chimneys. Scattered through Illinois and west of the Missouri River in eastern Nebraska and Kansas are found other centers of moderate activity.

The western mountain belt from Montana to northern Arizona had two destructive earthquakes in 1935, one close to Helena and a violent one near Three Forks, Mont., in 1925. Other earthquakes have damaged Kosmo, Utah (1934); Elsinore, Utah (1921); and Socorro, N. Mex. (1906). Great Bend, Tex., southeast of El Paso, experienced a badly damaging earthquake in 1931.

During recent years, the seismic activity of the Puget Sound area has increased. In 1946, a shock caused heavy damage in Seattle and several others were only a little less severe. In 1949 another caused a great loss to the Olympia-Tacoma area, being the strongest of all in the last 10 years. In 1936 northeast Oregon had a strong shock in an area only thinly populated.

*Alaska.*—Alaska has been frequented by more than 20 destructive earthquakes (actual or potential because of sparsely settled regions) in the past 50 years. The major belts extend from Fairbanks, south along the east side of the Alaska Range, through the Kenai Peninsula, to Kodiak Island, and skirt the mainland along the Gulf of Alaska and the Alexander Archipelago. Additional minor seismic areas exist along the southeast extremity of the Alaska Range near the Canadian border and the Seward Peninsula, especially near Nome and Teller. One damaging earthquake (potential) occurred during the same period near Haycock, Seward Peninsula. The Anchorage area often has earthquakes that would severely damage a more thickly populated region. The 1899 Yakutat Bay quake was one of the last century's most notable. The shore was raised over a great length and a 49-foot vertical fault slip occurred.

*Hawaiian Islands.*—For the most part, the earthquakes are concentrated in the south-central area of Hawaii and along the west coast. Hilo on Hawaii's northeast coast often suffers severe damage, too. About a half dozen moderately damaging earthquakes have occurred during the past century. Many of them were felt on the other islands, but caused little or no damage. A few other weak shocks have been located 10 to 75 miles east of Maui. Some of the heavy shocks felt on the islands seem to be of tectonic, not volcanic, origin.

*Puerto Rico.*—The western and northwestern sections of Puerto Rico have experienced about seven moderately damaging earthquakes in the last 50 years. The most damaging shock occurred on October 11, 1918, in the Mona Passage with intensities VIII and IX along the coast. A submarine shock in 1867, about 75 miles off the eastern coast, damaged all parts of the island, especially the eastern portion. About eight nondestructive shocks, centering in the mountainous area

halfway between San Juan and Ponce, have shaken areas seldom exceeding 25 miles in radius.

*Canal Zone.*—While no strong earthquakes begin in the Canal Zone, it is occasionally shaken by western Panamanian or northwestern Colombian earthquakes.

#### FREQUENCY AND PREDICTABILITY

The Coast and Geodetic Survey states that earthquakes cannot be predicted with respect to time and place except in terms that have little or no meaning. When the history of any seismic area is studied the pattern of earthquake occurrence is found to be so complex and erratic that it is quite impossible to derive from the data a formula that could be used to predict future disturbances. The gravitational pull of the planets is not sufficient to cause earthquakes that are just about ready to occur. In some places large areas of terrain move slowly along the creep or flow of the deep basement rock and when the pattern of this movement shows that some sections of the rock are "stuck" and obviously building up stresses that will eventually cause fracture, it is clear that the stage is set for an earthquake in that area. Such a condition exists along the San Andreas Fault in California where precise geodetic surveys have shown that since 1906 the terrain on one side of the fault has moved about 10 feet relative to the terrain on the other side. One must assume that sooner or later the stresses building up in between will again fracture the rocks along the fault; that the crustal rocks and overlying terrain will again slide along the fault or surface of fracture; and that in a matter of seconds a new state of stress equilibrium in the rock will be established. One might logically predict earthquakes in such areas but the time of occurrence will always be in doubt until the complete histories of a number of earthquake cycles are thoroughly known. In Japan some successful predictions of strong shocks apparently have been made through the discovery that certain changes in terrain and certain earthquake sequences form a pattern that seems to repeat itself after each great shock in the area under study.

The United States Coast and Geodetic Survey is authorized by law to make investigations in seismology. Its program represents about 20 percent of the work in this field done in the United States. Projects of a highly specialized nature are included. The Coast and Geodetic Survey operates six seismological stations of its own, with observatories at Tucson, Ariz.; Ukiah, Calif.; Sitka and College, Alaska; Honolulu, T. H.; and San Juan, P. R. The Survey also has a seismological laboratory at Washington, D. C. The Survey also serves as clearinghouse for much information collected by other groups. Among these is the Jesuit Seismological Association that itself coordinates the work of 18 seismological stations spread over the United States. The California Institute of Technology operates 11 stations in southern California for intensive study of earthquakes there. The University of California runs a similar network of 11 stations in northern California and western Nevada. In addition, a score or more of stations are operated independently by universities, and the United States Geological Survey operates seismograph stations in the Aleutians and on the island of Hawaii to study local earthquakes due to volcanic activity.

In cooperation with these various activities, the Coast and Geodetic Survey prepares earthquake catalogs and epicenter maps, and conducts investigations designed to achieve a better understanding of earthquake phenomena.

#### WARNING SERVICE

While the Survey has not yet devised any method of making an adequate and accurate prediction of the occurrence of any particular earthquake, its services are of practical use in minimizing earthquake damage, particularly in providing design engineers with valuable data on earthquake-resistant features for structures. Since quake forces are vibrational or dynamic, they require treatment different than that accorded static or steady forces. The earthquake menace is made more serious in tropical countries using a weak lime mortar in building construction. Moreover, tall, poorly braced frame structures with stone and lime-mortar panels and walls are a special menace, more so if built on watersoaked alluvial formations, such as those at the heads of bays and inlets. To mitigate damage to property and personal injury or death, it must be remembered that soft ground (especially fill) is subject to greater intensity of motion than rock outcrops in the same area. A structure built on grounds of differing composition, such as rock and soft ground, is especially susceptible to earthquake damage, for the differential motion between the two types of ground during a quake could wrench or damage the structure in a manner similar to that which would occur were it built on an active fault.

Poor materials also show up in earthquakes. Poor mortar and plaster fail to hold. Old school buildings seem especially offensive on the count of poor construction materials on the basis of the record. Failure to tie brick walls to interior framework frequently results in collapse of the walls while the rest of the building stays intact. This also holds true for cornices, parapet walls, and other parts of a building. Frame houses not tied to their foundations may slide off during an earthquake.

Geometric pattern of a building is also important. Simple structures of rectangular cross section that sway as a unit without interference from other structures withstand earthquakes best. If a building has two or more distinct parts that do not vibrate in unison under seismic forces, the parts tend to hammer each other, causing excessive damage or collapse. During the 1946 earthquake off the coast of the Dominican Republic, a priest on the island observed the battering action of the church steeple on its auditorium section, resulting in the collapse of both sections.

Proper design and good construction of buildings help minimize earthquake damage.

The insurance actuary also finds the Survey of aid in his attempt to learn where and to what extent earthquake dangers exist.

It is known that the fracture of great masses of rock radiates violent vibrations in all directions through the rock and overlying soil. These vibrations cause the damage. In the lighter geological formations overlying the rupture the force of these vibrations increases 5 to 20 times. The lightness of the rock and soil and the height of the water table influence this magnification. Consequently a lack of

uniformity results in damage from any particular earthquake. Also contributing to this lack is the difference in sturdiness of buildings.

The vibrations course through the earth in various ways. Two types of waves travel through the interior of the earth. The faster of these two alternately compresses and dilates rock as it travels forward, similar to the movement of a caterpillar. The slower type shakes rock sidewise as it advances, like the vibration of a violin string. Based on many thousands of seismograph readings, seismological tables have been computed. These show to the nearest second just how long it takes each of these two types of waves to travel to points on the earth's surface at various great circle distances from an earthquake's origin. By using this distance as a radius, an arc is swung around a globe for each reporting station. The common point of intersection of these arcs locates the epicenter of the earthquake.

Annually the Coast and Geodetic Survey office in Washington, D. C., receives about 15,000 earthquake messages. From them it locates epicenters of nearly 1,000 earthquakes within a matter of a few hours or days after they happen, depending on the violence of the shock and the number of reports received. This represents only about 10 percent of the total number of earthquakes ultimately reported in this Survey program. The press and the public are enabled to receive quick and authentic information on all strong shocks. This is as close as the Survey has been able to come in providing a warning service, and it proves of value in safeguarding against the usual aftershocks. Experience has shown the falseness of the philosophy that maintains that a damaged structure will withstand strong aftershocks just because it withstood the main shock. In truth, a building damaged by the main shock is made weaker by each aftershock.

However, experience also indicates that few fatalities are caused by the actual collapse of a structure. Pictures taken immediately following an earthquake usually show all buildings still stand despite widespread structural damage. Noting that only about 1,000 persons have been killed in the United States by earthquakes since the country was settled (700 in the 1906 California quake alone), the Survey states that most of those killed had rushed outdoors just as cornices, bricks, and other parts of buildings crashed to the sidewalk and street. Some of those remaining inside buildings were killed or injured by falling chunks of plaster.

The lessons drawn by the Survey are as follows: To avoid injury get as quickly as possible under doorways, arches, tables, desks, or anything that will serve as protection against a falling ceiling. Do not rush into the street, and do not enter the street without taking a precautionary glance overhead. If caught on a sidewalk when an earthquake strikes, leave it as soon as possible; try to enter an open doorway or go to the middle of a wide street.

Should the earthquake strike an area bordering the ocean, it must be remembered that tidal waves may inundate the low-lying areas. As noted in our discussion of seismic sea waves, the phenomenon first noted by most observers is the withdrawal of water from land for a period of from 5 to 10 minutes. Those attracted toward the shore by this sight place themselves in extreme danger, as the returning wave will not only reach the earlier normal water level but will in-

undate the surrounding land. The withdrawal of water should rather be used as a signal to rush for high land. It is noted that the Japanese coastal practice of heading for the hills as soon as strong earth shocks are felt has saved thousands of lives that would otherwise be lost in tidal waves.

One of the more important functions performed by the Coast and Geodetic Survey in its efforts to learn more about earthquakes is its collection of descriptive information. This is done mostly from the San Francisco office of the Survey because in recent years most earthquakes in the United States occur in the Pacific coast and western mountain regions. Thousands of cooperators supply this information on questionnaire cards kept on hand. Postmasters and others in the affected area are canvassed immediately after a quake occurs. Field surveys by seismologists who hurry to the scene of destructive earthquakes as soon as possible after they occur result in additional information.

All this information is of value for statistical purposes and also to supply data on earthquake intensity distribution in a shaken area.

In recent years, undesirable confusion has developed among the public concerning the connotation of earthquake intensity as distinguished from that of earthquake magnitude. It is primarily the intensity with which the public should be concerned. Intensity describes the violence caused by an earthquake on the earth's surface. It is based on earthquake effects reported on people and on things. Violence of an earthquake at a given distance from epicenter depends not only on the strength of the quake at its focus, but also largely upon local geological factors, such as the lightness of overlying soil. Magnitude, on the other hand, is dependent on the amount of energy released at the focus or underground center of an earthquake. It is determined from the amplitudes of ground vibrations registered at seismological stations. Magnitude is reported, not in terms of energy, but in terms of a mathematical function of energy according to a scale developed about 12 years ago by the Pasadena Seismological Laboratory of California Institute of Technology. Intensity is measured according to the Modified Mercalli Intensity Scale of 1931 in this country. This separates intensity into 12 grades from grade I (so feeble a vibration that a person would observe it only if lying quietly in bed) to grade XII (so intense a vibration that whole villages would be flattened, most buildings in a large city damaged, and disastrous mountain slides would result). The midgrade VI is used to describe vibrations that cause superficial property damage such as cracked windows, plaster, and chimneys.

In a given epicentral area, the relation between maximum intensity and magnitude is shown in table 38.

TABLE 38.—Comparison of maximum intensity with magnitude of earthquakes in California

Magnitude.....	2.2	3	4	5	6	7	8	8.5
Maximum intensity.....	1.5	2.8	4.5	6.2	7.8	9.5	11.2	12.0

While both attributes show constant increase, they are expressed in terms of different units.

## DAMAGE

At the outset it is well to issue the caveat that earthquake damage statistics are highly unrepresentative as forecast tools. This becomes obvious when one considers that a single disastrous earthquake could occur any time in a large city, causing billions of dollars in damages.

It must also be remembered that the direct, or shakedown, effect of an earthquake may result in less damage than the indirect earthquake effects of fire, explosion, electrocution, flooding, etc.

These precautions should be kept in mind in any attempt to use the following tables as guides in charting potential damage from future earthquakes.

Table 39 contains estimates of damage caused by major recorded earthquakes in the United States. For purposes of comparison, the estimates are given in terms of a dollar having a 1950 evaluation.

TABLE 39.—*Damage caused by major United States earthquakes*

Year	Place	Damage <sup>1</sup>
1865	San Francisco, Calif. ....	\$500,000
1868	do. ....	750,000
1872	Owens Valley, Calif. ....	250,000
1886	Charleston, S. C. ....	23,000,000
1892	Vacaville, Calif. ....	280,000-600,000
1898	Mare Island, Calif. ....	1,400,000
1906	San Francisco, Calif. ....	90,000,000
	Fire loss ....	1,500,000,000
1915	Imperial Valley, Calif. ....	2,500,000
1918	San Jacinto and Hemet, Calif. ....	350,000
1918	Puerto Rico (damage from sea wave from earthquake in Mona Passage) ....	8,000,000
1925	Manhattan and Three Forks, Mont. ....	400,000
1925	Santa Barbara, Calif. ....	8,000,000
1933	Long Beach, Calif. ....	48,000,000
1935	Helena, Mont. ....	4,000,000
1940	Imperial Valley, Calif. ....	7,200,000
1941	Santa Barbara, Calif. ....	120,000
1941	Torrance-Gardena area, California ....	1,200,000
1944	Cornwall-Massena; Canada, New York ....	1,800,000
1946	Hawaiian Islands (damage, from sea wave from earthquake in Aleutian Islands) ....	25,000,000
1949	Puget Sound, Wash. ....	25,000,000
1949	Terminal Island (oil wells only) ....	9,000,000
1950	Calipatria, Calif. ....	50,000
1951	Terminal Island, Calif. ....	3,000,000
1952	Kern County, Calif. ....	60,000,000

<sup>1</sup> Based on 1950 evaluation of the dollar.

In order to obtain a more comprehensive view of damage caused by earthquakes in the United States in recent years, table 40 has been prepared covering the 5 years from 1950 through 1954.

TABLE 40.—*Estimated property loss due to recent United States earthquakes*

Date	Location	Damage
July 28, 1950	Westmorland, Calif. ....	\$1,000
July 29, 1950	Near Calipatria, Calif. ....	50,000
Aug. 1, 1950	do. ....	1,000
Dec. 14, 1950	Near Herlong, Calif. ....	75,000
Jan. 23, 1951	Near Calipatria, Calif. ....	10,000
Aug. 15, 1951	Terminal Island, San Pedro Bay. ....	12,000,000
Oct. 7, 1951	Off Cape Mendocino, Calif. ....	15,000
Dec. 5, 1951	Northeast of Brawley, Imperial Valley. ....	5,000
July 21, 1952	Wheeler Ridge, Kern County, Calif. ....	60,000,000
July 22, 1952	Tejon Ranch, Arvin, Calif. ....	
July 23, 1952	Arvin, Calif. ....	
July 29, 1952	Bakersfield, Calif. ....	
Aug. 22, 1952	do. ....	
Sept. 22, 1952	12 miles southwest of Petrolia, Calif. ....	10,000
Nov. 21, 1952	Near Bryson, Calif. ....	20,000
Sept. 25, 1953	Western Nevada and northeastern California. ....	5,000
Jan. 12, 1954	West of Wheeler Ridge, Calif. ....	10,000
Apr. 25, 1954	East of Watsonville, Calif. ....	100,000
July 6, 1954	East of Fallon, Nev. ....	500,000
Aug. 23, 1954	do. ....	500,000
Dec. 16, 1954	Near Frenchman's Station, Nev. ....	100,000
Dec. 21, 1954	12 miles east of Eureka, Calif. ....	300,000

<sup>1</sup> Over \$2,000,000.

A glance at either table 39 or table 40 shows a noticeable departure from the average annual loss in any given year. In this respect, the statistics resemble those for floods in the United States. But the total earthquake damage is far less than the total flood damage in this country.

The same relationship prevails with respect to lives lost in earthquakes in the United States, as listed in table 41.

TABLE 41.—*Lives lost in major United States earthquakes*

Year	Place	Lives lost
1811	New Madrid, Mo. ....	( <sup>1</sup> )
1812	San Juan Capistrano, Calif. ....	40
1868	Hayward, Calif. ....	30
1872	Owens Valley, Calif. ....	27
1886	Charleston, S. C. ....	60
1899	San Jacinto, Calif. ....	6
1906	San Francisco, Calif. ....	700
1915	Imperial Valley, Calif. ....	6
1918	Puerto Rico (killed by sea wave from earthquake in Mona Passage) ....	116
1925	Santa Barbara, Calif. ....	13
1929	Grand Banks, Newfoundland (killed by sea wave along Burin Peninsula) ....	( <sup>2</sup> )
1933	Long Beach, Calif. ....	120
1934	Kosmo, Utah. ....	2
1935	Helena, Mont. ....	4
1940	Imperial Valley, Calif. ....	9
1946	Hawaiian Islands (killed by sea wave from earthquake in Aleutian Islands) ....	173
1949	Puget Sound. ....	8
1952	Kern County, Calif. ....	13

<sup>1</sup> Several.    <sup>2</sup> Some.

The Coast and Geodetic Survey, in material prepared for this study, notes that the total loss of property for the 5 outstanding, 11 great, and other damaging earthquakes of record in the Pacific coast-Nevada area of the United States amounts to \$240 million. [During these same tragedies, the total loss of life was 950. While actual earthquake damage in San Francisco during the 1906 quake probably did not exceed \$25 million (1906 dollar value), the city was practically razed by fires the earthquake caused. These burned unchecked for days due to the wrecking of the water supply system.

The 1868 quake along the Hayward Fault damaged almost every building in Hayward and piled up \$350,000 worth of damage in San Francisco.

The 1872 earthquake in Owens Valley wrecked all adobe houses at Lone Pine and killed 27 of the 300 population. In 1892 nearly all brick buildings in Vacaville were wrecked; and in 1899 almost all brick buildings were damaged in San Jacinto and Hemet, Calif. An earthquake in 1918 in these same towns wrecked all poorly constructed buildings in the business area.

In 1920 Inglewood, Calif., had a localized disturbance that wrecked many buildings. The 1925 earthquake at Santa Barbara damaged all but a few buildings on the city's main street.

The 1933 quake was notable in that although it was not potentially great, its zone of greatest energy release seems to have occurred near Signal Hill, only a few miles from Long Beach, where 120 persons were killed and \$41 million damage was caused.

The 1940 earthquake near Imperial was featured by a 15-foot horizontal fault movement. It killed 9 people and caused \$6 million worth of damage in terms of the 1940 value of the dollar.

1941 saw 2 damaging shocks, 1 near Santa Barbara resulting in \$100,000 damage on June 30 and another in the Torrance-Gardena area doing \$1 million damage.

The heavy \$9 million damage on Terminal Island in San Pedro Bay in 1949 was caused by a relatively minor quake that sheared 200 oil wells near the 1,700-foot level.

The strongest California earthquake since 1906 hit south of Bakersfield on July 21, 1952. The main shock and a series of strong after-shocks (especially one on August 22) killed 13 persons and caused \$60 million damage to buildings, railroads, and crops. Arvin and Tehachapi were hit even harder than Bakersfield by the quake but having less total valuation for improvements on property subject to damage, their total dollar value of damage was less.

In the Puget Sound area a 1946 shock caused \$250,000 damage in Seattle. The strongest shock in this area in recent years on April 13, 1949, caused about \$25 million damage in cities bordering Puget Sound. An unusually strong shock in 1936 resulted in little damage because it centered in a sparsely populated area of northeastern Oregon.

The western mountain region outside Nevada has experienced several damaging earthquakes. Just south of the border of the United States in 1887, an earthquake destroyed a church at Bavispe, State of Sonora, Mexico, and damaged many other buildings.

In 1906, a brief series of strong shocks cracked and felled some adobe walls in Socorro, N. Mex.

Another series of strong shocks in 1921 damaged half the buildings in Elsinore, Utah, wrecked a school and knocked down many chimneys.

In 1925 violent shocks near Manhattan and Three Forks, Mont., cracked many buildings, toppled chimneys and caused landslides blocking the main line of the Chicago, Milwaukee & St. Paul Railroad for many days. A half million dollar loss resulted.

A violent shock centering near Valentine, Tex., in the Great Bend area southeast of El Paso badly damaged buildings and knocked down many chimneys.

In 1934, a strong shock near Kosmo, Utah, cracked walls and chimneys and caused plaster to fall in Salt Lake City.

The following year two destructive earthquakes centered near Helena, Mont., causing over \$4 million damage.

Damage in the Mississippi Valley region has been comparatively slight, considering that the Nation's most powerful earthquake hit Missouri in 1811 (when it was sparsely settled). Cracked walls and toppled chimneys resulted from an earthquake in central western Ohio in 1875. Chimneys were also demolished near Charleston, Mo., in 1895 during an earthquake.

In the Eastern United States, the greatest earth shock hit Charleston, S. C., on August 31, 1886, killing 60 persons and causing \$13 million damage. Buildings, bridges, and railroad tracks were damaged. The 1944 earthquake near Massena, N. Y., caused \$2 million damage in Massena and neighboring Cornwall, Canada. Other quakes in eastern United States have cracked walls and toppled chimneys but have caused no more serious damage.

Lack of population and structures has held down the damage from the 20 potentially destructive earthquakes Alaska has suffered in the past half century.

The Hawaiian Islands have sustained damage from earthquakes of tectonic origin as well as from volcanic eruptions. An extremely violent and destructive quake in 1868 hit the island of Hawaii, sparsely settled as it was.

Puerto Rico's last 50 years have brought about 7 moderately damaging earthquakes. Most notable was that of October 11, 1918, which caused great damage in Mayaguez and nearby towns.

The Canal Zone has suffered little damage from the occasional quakes it feels.

### VOLCANOES

Related to earthquakes in destructive potential, volcanoes accomplish destruction by different means. Under the discussion concerning earthquakes, it has already been noted that earthquakes due to volcanic activity may seem violent locally but are never very deep or felt at great distances. Yet the crushing, burning effect of lava (molten rock) and the engulfing effect of mud are tools of destruction present in volcanic eruption and absent in earthquakes.

Technically, a volcano is an opening in the crust of the earth, through which heated matter is brought to the surface. This matter forms a more or less conical hill, generally with a crater at the top. For the following material on the general nature of volcanoes, we are indebted to the *Encyclopaedia Britannica*.

A volcanic eruption is usually preceded by certain symptoms, such as local earthquakes, underground noises, changes in the flow and temperature of springs, evolution of gases in and near the crater and warming or boiling of any water in the crater. One of the earliest features of an eruption is the emission of vapor, growing in volume during an eruption and lingering at its conclusion. During the outbreak at Krakatoa in 1883, the column of steam and dust rose to an altitude of nearly 20 miles. As the steam condenses to rain, it may mix with volcanic ash and loose material to form mud. In turn the mud rushes down the cone. During Vesuvius' eruption in A. D. 79, the settlement of Herculaneum was buried beneath a flood of mud.

Mud may also be formed by the mixture of volcanic ash with water from streams or with snow. Mount Pelée in Martinique produced a mud torrent in 1902.

Once in eruption, the volcano discharges fresh lava in various forms, ranging from cinders to sand to ash to dust. The dust is very penetrating, drifting into buildings even with closed windows and doors. A heavy fall of ash or cinders may crush buildings by sheer weight. At times dry ash slides down the cone like an avalanche, burying settlements beneath it.

Solidified lava on being extruded from the volcano also flows down the cone and the surrounding terrain in a relentless river. Its flow speed depends partly on its own consistency (governed by its chemical composition and the accompanying cooling conditions) and by the slope of the bed over which it flows. During the 1855 eruption of Mauna Loa on the island of Hawaii, the lava flowed at an estimated 40 miles per hour. The rate of flow decelerates as the stream advances, with marked retardation in small flows.

Whether emission of lava is violent or passive is thought to depend on the chemical composition of the molten material as it exists within the interior of the earth, containing water and other volatile substances. As steam becomes disengaged from this matter during its rise up the throat of the volcano, it generates pressure. If present in large quantities, it acts much as does gunpowder, forcing the lava out with explosive force on the same principle that causes the burning gunpowder to expel a bullet.

A form of volcanic action not common occurred in the 1902 eruptions in Martinique and St. Vincent. This was a sudden emission of a dense black cloud of superheated and suffocating gases, heavily charged with incandescent dust. The cloud moved swiftly and was accompanied by immense volumes of volcanic sand descending like a hot avalanche. After leaving the crater, the cloud expanded enormously, producing intense darkness and lightning. Like a gigantic smog, its deadly effect appears to have been mostly due to irritation of the mucous membrane of the respiratory passages by the fine, hot dust.

Some evidence exists that in older times lava quietly welled forth from fissures in the earth and overflowed the surrounding area. It is said that in parts of Nevada, Idaho, Oregon, and Washington, sheets of late Tertiary basalt from fissure eruptions occupy a 200,000 square mile area and have piled to a thickness of 2,000 feet. No current recurrence of any such phenomenon has been noted in the United States or its territories.

Volcanoes are mostly found in regions of great seismic activity. Volcanic action is a means of relieving local strains in the earth's crust, and occurs where folding and fracture of rocks has frequently happened and where mountains are still being made. Many volcanoes are found along folded mountain chains, especially where close to oceanic basins.

Like earthquakes, volcanoes rim the Pacific Basin intermittently. Indeed, they accompany adjustments of the earth's crust as do earthquakes, but the two do not seem to bear a cause-and-effect relationship.

In the United States and its territories, few volcanoes are now active. On the continental United States, no dangerous eruptions have

occurred during this century. In 1857 an eruption took place at Tres Virgines in southern California. Mount St. Helens in Washington erupted in 1841 and 1842. Mount Baker in Washington (most northerly of the Cascade Range volcanoes) was reported active in 1843. Only a few of the Cascade Range volcanic peaks show signs of activity. Mount Hood, Oreg., and Mount Rainier, Wash., exhale vapor. Lassen's Peak, Calif., renewed mild activity a few years ago.

The Hawaiian Archipelago has a chain of 15 large volcanic mountains. All appear to be extinct except three on the island of Hawaii—Mauna Loa, Kilauea, and Hualalai. The last of these has been dormant since 1811.

At the request of the National Park Service, Department of the Interior, Dr. Gordon A. Macdonald, volcanologist in charge, Hawaiian Volcano Observatory, has supplied the staff of the committee with the following information concerning the remaining two.

Mauna Loa volcano has averaged 1 eruption each 3.6 years since 1832. The interval between eruptions has ranged from a few months to 14 years. About half of the eruptions took place on the flank of the volcano, where they probably would do damage under present-day conditions of land use.

There was activity in the crater of Kilauea volcano most of the time from 1823 to 1924, but during that interval only four flows occurred on the flanks of the mountain where damage resulted. Crateral activity generally causes no damage, and actually is a boon, in that it stimulates tourist visits. Three of the four flank flows are now within Hawaii National Park. In subhistoric times a flank flow occurred about 1750, and another about 1790. Both would have caused property damage under modern conditions. The flows of 1750, 1790, and 1840 were in the eastern part of the Puna district, near the destructive flows of 1955.

During the last 20 years damage has resulted from lava flows of Mauna Loa during the eruptions of 1935-36, 1942, and 1950; and from the Kilauea flows of 1955.

During the eruption of 1935-36, flows covered about 2,000 acres of pasture and forest land, and a much larger area of wasteland higher on the mountainside.

During the eruption of 1942 the flow covered about 3,500 acres of forest land. This, it is believed, was all Territorial land, not in use except as watershed.

The 1950 eruption covered 14,247 acres of ranch land with lava (figure supplied by Territorial tax office). In addition, 7,685 acres of forest land was destroyed. One restaurant with rental cottages and dwelling house, 1 filling station, 2 ranch houses, and several smaller houses were destroyed. The same flows covered 1.59 miles of public roads.

By far the most destructive, in terms of property damage, were the flows of 1955. Data on the 1955 eruption are tabulated below. Mapping of the flows has not yet been completed, because it has not yet been possible to obtain aerial photographs of suitable quality. The evaluation of land and other losses also is still in progress. Therefore, some of the figures are estimates, or approximations.

Total area covered by lava and cinder.....	acres.....	1 3, 112
Total cane land covered by lava and cinder.....	do.....	717. 97
Cane land, Olaa Sugar Co., Ltd.....	do.....	155. 84
Cane land, independent planters.....	do.....	562. 13
Other cultivated land.....	do.....	1 400
Forest land.....	do.....	1 2, 000
Houses destroyed.....		21
Large greenhouse destroyed.....		1
Houses abandoned because rendered uninhabitable.....		4
Houses moved by American Red Cross because sites untenable.....		3
Houses replaced by American Red Cross.....		7
Public roads buried.....	miles.....	6. 3

<sup>1</sup>Approximate.

There have also been several recent reported sightings of what appears to be undersea volcanic activity in the area west of the Hawaiian Islands.

Volcanic activity is also prominent along the coastal range of Alaska and in neighboring islands and in the Aleutian Islands. Mount Wrangell was reported in eruption in 1819. Mount Fairweather may have seen fairly recent activity. Cook's Inlet area has several volcanoes, including the island of St. Augustine. There are two volcanoes on Unimak Island from which the natives obtain obsidian (volcanic glass) and sulfur. The Aleutian volcanic belt is a narrow, curved island chain, running westerly from Cook's Inlet for nearly 1,600 miles.

The Geological Survey in the Department of the Interior has prepared table 42 in order to itemize the list of volcanic eruptions in Alaska, including the Aleutians, since 1930.

TABLE 42.—*Volcanic eruptions in Alaska, including the Aleutians, since 1930*

Year	Eruption	Nature	Year	Eruption	Nature
1930.....	Veniaminof.....	Lava flow.	1946.....	Shishaldin.....	Ash shower.
	Pavlof.....	Ash shower.		Akutan.....	Do.
1931.....	Aniakchak.....	Lava flow.	1947.....	Iliamna.....	Smoke.
	Pavlof.....	Ash shower.		Shishaldin.....	Ash shower.
	Akutan.....	Do.	1948.....	Pavlof.....	Do.
	Bogoslof.....	Submarine ash.		Shishaldin.....	Do.
	Okmok.....	Ash shower.		Akutan.....	Do.
1932.....	Shishaldin.....	Do.	1949.....	Shishaldin.....	Do.
	Cleveland.....	Do.		Akutan.....	Do.
1933.....	Redoubt.....	"Smoke."		Great Sitkin.....	Do.
	Iliamna.....	Do.	1950.....	Pavlof.....	Do.
	Great Sitkin.....	Ash shower.		Shishaldin.....	Do.
1934.....	No eruptions reported.			Akutan.....	Do.
1935.....	Augustine.....	Lava flow.		Great Sitkin.....	Do.
1936.....	Magelk.....	Ash shower.	1951.....	Pavlof.....	Do.
	Pavlof.....	Do.		Shishaldin.....	Do.
	Okmok.....	Do.		Akutan.....	Do.
1937.....	Pavlof.....	Do.		Makushin.....	Do.
	Yunaska.....	Do.		Bogoslof.....	Submarine ash eruption.
1938.....	Pavlof.....	Do.			
	Makushin.....	Do.	1952.....	Korovin.....	"Smoke."
	Okmok.....	Lava flow.		Iliamna.....	Do.
	Cleveland.....	Ash shower.		Pavlof.....	Ash shower.
1939.....	Veniaminof.....	Do.		Shishaldin.....	Do.
	Pavlof.....	Do.		Akutan.....	Do.
1940.....	do.....	Do.		Makushin.....	"Smoke."
1941.....	do.....	Do.	1953.....	Spurr.....	Ash explosion.
1942.....	do.....	Do.		Iliamna.....	"Smoke."
1943.....	do.....	Do.		Trident.....	Lava smoke.
1944.....	do.....	Do.		Magelk.....	Ash shower.
	Veniaminof.....	Do.		Pavlof.....	Do.
	Pavlof.....	Do.		Shishaldin.....	Do.
	Cleveland.....	Do.	1954.....	Akutan.....	Do.
1945.....	Pavlof.....	Do.		Pavlof.....	Do.
	Okmok.....	Ash shower and lava flow.		Shishaldin.....	Do.
	Great Sitkin.....	Lava flow.		Akutan.....	Do.
1946.....	Magelk.....	Ash shower.	1955.....	Pavlof.....	Do.
				Shishaldin.....	Do.

It will be noted that the greatest number of eruptions during that period is made up of several eruptions from each of a few volcanoes. A smaller number of the total is composed of single eruptions from each of several volcanoes.

#### PREDICTABILITY

At present it seems impossible to predict with accuracy just when volcanic eruption may occur in any known volcano or when or exactly where new volcanoes will develop. With reference to the Alaskan and Aleutian volcanoes, Acting Director Thomas B. Nolan, Geological Survey, stated to the staff of the committee:

Scanning the records prior to the last 25-year period, the same pattern persists: a few volcanoes can be expected to erupt several times during any given quarter century; a larger number might erupt once; and many just possibly could explode with catastrophic violence, as did Katmai in 1912. Nineteen of the known Alaskan volcanoes have had such catastrophic explosions in the past. It is meaningless to try to estimate the probabilities of such a disaster occurring within any span of years, but it is, however, feasible to designate the area that could be subject to damage if such a catastrophic eruption takes place.

Outlined, in a dashed line, on the attached map, figure 25, is the area of which some part could be damaged by the falling ash if any of the volcanoes between Mount Wrangell and Mount Chiginagak were to have a catastrophic explosion; the rest of the peninsula and the Aleutian Islands as far west as Buldir are subject to similar hazard. Enclosed in solid line circles are the small local areas in which damage may be expected, perhaps several times in a 25-year period.

A large part of southeastern Alaska would be subject to damage were Mount Edgecumbe to erupt in violent explosion.

FIGURE 25



**FIGURE 25—Continued**

Dr. Macdonald is said to have commented on the recent reports of new undersea volcanic activity near the Hawaiian Islands by noting one is never certain where new volcanoes will develop or that supposedly extinct volcanoes will not resume activity. Of fairly recent memory is the formation of a new volcano, Paracutin, from a field in Mexico.

#### WARNING SERVICE

Because of the difficulty in predicting the time or place of volcanic eruption, warning service is necessarily meager. As previously noted, there are certain recognizable symptoms preceding eruption, but the presence of a symptom such as vapor emission is not necessarily a sign of imminent eruption. Obviously when a dangerous eruption occurs, the spectacle of sight and sound is sufficient to serve as its own warning to most of those within the area of potential destruction.

#### DAMAGE

In territory under jurisdiction of the United States most volcanic eruptions occur in comparatively sparsely settled area. Resulting damage is therefore light when compared with that caused by floods or even earthquakes occurring in highly populated and developed areas. On the credit side, Dr. Macdonald notes that crateral activity in Kilauea actually is a boon stimulating visits by tourists. On the deficit side, however, it is noted the flank flows from Kilauea in 1750 and 1790 would have caused property damage under modern conditions. Mauna Loa's 1935-36 eruptions resulted in a lava cover over some 2,000 acres of pasture, forest and wasteland, for which no evaluation was made. The same lack of evaluation occurred after the 1942 flow from Mauna Loa covered 3,500 acres of forest land.

On the 14,247 acres of ranch land covered by lava from Mauna Loa's 1950 eruption, the assessed value for tax purposes was 10 cents per acre, with the actual market value at some undetermined higher level. Value of the 7,685 acres of forest land destroyed was not computed. Replacement cost of the 1.59 miles of public roads covered by the flow was estimated to be \$159,995 according to the Territorial highway department. Insured building losses amounted to about \$50,000, according to the board of underwriters of Hawaii.

The most destructive property damage was done by the Kilauea flow of 1955 in the Puna District on the island of Hawaii. This eruption continued up to May 26. On March 9, 1955, Hon. Samuel Wilder King, Governor of the Territory of Hawaii, appointed the Puna Volcanic Factfinding Committee. This committee on April 5, 1955, submitted its report showing an estimated total loss of \$928,609 resulting from the 1955 eruption of Kilauea up to March 28, 1955. It also noted the threat of a considerably greater loss than that total should future agricultural development of the Puna area be substantially retarded. The committee's report is set forth in full as follows:

PUNA VOLCANIC FACTFINDING COMMITTEE,  
Hilo, Hawaii, April 5, 1955.

Gov. SAMUEL WILDER KING,  
Iolani Palace, Honolulu, Hawaii.

DEAR GOVERNOR: Your Puna Volcanic Factfinding Committee which you appointed on March 9, 1955, and which you instructed to develop a statement within 30 days covering the estimated monetary losses caused by the volcanic eruptions in the Puna District on the island of Hawaii is herewith submitting its report, in duplicate.

As near as we can ascertain, 121 individuals and corporations have suffered monetary losses in this eruption and all have been interviewed by at least 1 member of your above committee.

Attached hereto is a map with the approximate locations of the various recent lava flows in the Puna District up to April 2, 1955.

It is estimated that a total of approximately 3,112 acres of land were covered by fresh lava of which about 832 acres were under cultivation.

We are appending hereto exhibits Nos. 1 through 9, plus individual statements listing losses suffered as submitted by the individuals concerned. The estimated losses in nearly every case is the figure submitted by the individual or corporation involved. These attached exhibits indicate our estimated monetary value of the material damage to the real and personal property of each individual and corporation involved, as requested in your letter of appointment of March 9, 1955.

The payment by insurance companies of a reported \$609,773 to cover the damage caused by burning growing cane crops results in an overall profit to the cane planters affected by this eruption. The insurance companies are also reported to have made an additional payment to the affected cane planters of \$112,778 to cover the estimated cost to the planters of removing the unharvested burned cane from their canefields to provide for the normal cultivation of the succeeding crop. Since this latter figure is an expense item it has not been included in our summary which shows an overall profit to the cane planters involved. Thus, the total insurance payments either made or to be made by the insurance companies are reported to total \$722,551.

The appended summary sheet to this letter itemizes the total losses suffered according to land classification, variety of crops destroyed or damaged, etc.

If the net profits resulting from applying the proceeds of the cane insurance payments to the growing crops are taken into consideration, the overall net loss resulting from the Puna volcanic eruptions from February 28 to March 28, 1955, totals \$705,537.

However, the total losses suffered, independent of those cane planters who have made a profit, amounts to an estimated total of \$928,609, which figure is our estimate of the loss resulting from the Puna volcanic eruptions to March 28, 1955.

Your committee wishes to point out that the future agricultural development of the Puna district may be substantially retarded, owing to a possible lack of confidence in that area by our lending institutions, crop-insurance companies, and planters. If this development occurs it may well prove to amount to considerably more of a loss to our economy in the next decade than the total of the losses enumerated herewith.

Respectfully submitted.

PUNA VOLCANIC FACTFINDING COMMITTEE,  
LESLIE W. WISHARD, *Chairman*,  
YOSHIO INABA, *Vice Chairman*,  
CHARLES T. TONG,  
ARATA KANSAKO,  
A. M. HIERONYMUS.

Enclosures:

1. Map showing affected area. (Not included in staff study.)
2. Cane growers' statements of profit or loss.
3. Cane growers' statements of profit or loss.
4. Statement of losses of fruits, etc.
5. Statement of losses of truck crops.
6. Statement of losses of forest and wasteland.
7. Statement of losses of buildings, equipment, etc.
8. Statement of losses to private roads.
9. Statement of losses to Territorial and county roads.

TABLE 43.—*Puna Volcanic Factfinding Committee—Summary statement of losses, Apr. 2, 1955*

Key to exhibit Nos.		Acres	Land value	Estimated tons sugar at harvest	Estimated net loss or (profit) at harvest <sup>1</sup>	Total net loss or (profit) <sup>1</sup>
1	Crops and land covered by 1955 flow:					
	Sugar cane land:					
2	Olaa Sugar Co. ....	181. 00	\$65, 190	1, 858	(\$24, 961)	\$40, 209
3	57 independent fee and lessee planters (23 owners, 34 lessees) .....	405. 00	145, 800	3, 739	(38, 535)	107, 265
	Subtotal (cane land at \$360 per acre) .....	586. 00	210, 990	5, 597	(63, 496)	147, 474
	Miscellaneous cropland:					
4	Coffee (less than 1-year-old land at \$175 per acre) .....	120. 00	5, 250	-----	-----	5, 250
4	Papaya (land at \$360 per acre) .....	104. 00	37, 440	-----	-----	37, 440
4	Fruits and nuts (land at \$360 per acre) .....	11. 20	4, 032	-----	-----	4, 032
5	Vegetables (land at \$360 per acre) .....	11. 98	4, 313	-----	7, 960	12, 263
	Subtotal .....	247. 18	51, 035	-----	7, 960	56, 985
	Other lands:					
6	Beach lots (\$1,000 per acre) .....	50. 00	50, 000	-----	-----	50, 000
6	Forest land (\$100 per acre) .....	300. 00	30, 000	-----	-----	30, 000
6	Wasteland (\$10 per acre) .....	1, 929. 00	19, 290	-----	-----	19, 290
	Subtotal .....	2, 279. 00	99, 290	-----	-----	99, 290
	Crops burned and destroyed:					
	Sugarcane:					
2	Olaa Sugar Co. ....	285. 00	-----	2, 925	(76, 837)	(76, 837)
3	65 independent fee and lessee planters (22 owners, 43 lessees) .....	800. 00	-----	7, 309	(122, 922)	(122, 922)
	Subtotal .....	1, 085. 00	-----	10, 294	(199, 759)	(199, 759)
	Miscellaneous crops:					
4	Coffee (less than 1 year old) .....	3. 00	-----	-----	36, 928	36, 928
4	Papaya .....	6. 00	-----	-----	120, 834	120, 834
4	Fruits and nuts .....	6. 50	-----	-----	13, 655	13, 655
5	Vegetables .....	13. 50	-----	-----	-----	-----
	Subtotal .....	29. 00	-----	-----	180, 417	180, 417

7	Buildings, roads, etc., destroyed:					
7	Current estimated value of buildings.....					26, 702
7	Equipment, supplies, and personal possession.....					34, 332
7	Poultry and livestock.....					3, 496
8	Replacement of Olaa Sugar Co. and planters' roads.....					40, 360
9	Replacement of Federal aid and county roads (as of Apr. 2).....					314, 280
	Subtotal.....					419, 130
	Grand total, net.....	4, 226. 18	361, 285	15, 886	(74, 878)	705, 537
	The grand total loss, excluding those cane planters who show a profit, amounts to.....					928, 609

<sup>1</sup> Net after crediting cane fire-insurance payments said to total \$609,803 but not including an allowance of \$112,778 for clearing the unharvested burned cane from the fields to provide for the cultivation of succeeding crops.

NOTE.—In addition there are 42.5 acres of coffee and miscellaneous fruits and vegetables with an estimated probable crop value of \$25,044 which may be seriously injured by sulfur fumes but probably will recover completely.

Also available is a report on the estimated loss to April 9, 1955, made by a representative group of community leaders, according to Governor King of Hawaii, who kindly forwarded a copy of the report to the committee staff. The report follows in full.

APRIL 12, 1955.

Re Estimated loss because of volcanic damage, Puna area

HON. SAMUEL WILDER KING,

*Governor, Territory of Hawaii, Honolulu, T. H.*

SIR: Attached for your information is a report which indicates an estimated net loss of \$2,847,003 because of volcanic action in the Puna area up to April 9, 1955. This report was prepared by a representative group of community leaders living within the Kapoho-Opihikao area. Included on the committee were Mr. Koji Iwasaki, Mr. Albert Kudo, Mr. Hisashi Ogata, Mr. Koichi Soga, representatives of Olaa Sugar Co., Mr. Frank Burns, Mr. Nelson West, Mr. David Yeaman, Mr. K. Hirose, and Mr. Richard Lyman, Jr.

Citizens living in the Puna area appreciate your action in having a report of losses prepared by a fact-finding committee. A report from this committee was submitted to you on Thursday, April 7, and has been carefully reviewed by the committee which prepared the attached report. It is fully realized that when a disaster of such magnitude occurs, there could be a difference of opinion as to losses suffered. The committee which prepared the attached report believes, however, that the report prepared by Mr. Wishard and his committee did not fully or accurately estimate the amount of loss in the Puna area.

The purpose for submitting to you the attached report is in order that you may have detailed information regarding losses suffered. I would like to offer an explanation of the report attached herewith.

The estimated losses are broken down into two areas, known as the Kapoho and the Opihikao areas. In the Kapoho area, 471 acres of cane land were covered by lava. The going price on such cane land is \$340 per acre. In addition, there is a cost figure of \$120 per acre for roads. Roads must be built to carry heavy equipment, especially trucks having a gross weight of 30 tons. For this reason roads must be constructed above the minimum field road standards. The minimum cost for such roads is \$120 for each acre.

There is also a stumpage value of \$150 per acre and an additional cost of \$60 on the average for leveling and repairing fields for mechanization.

As a result of the lava flow, 185 acres of cane land has been abandoned owing to difficulty to secure ingress and egress into the area. We place a value on such abandoned fields of \$330 per acre.

A promising new industry was the papaya industry, consisting of approximately 150 acres, which lost 100 acres valued at \$1,000 per acre for land and crop.

Approximately 950 acres of wasteland was covered. The value of that land is considered to be a minimum of \$35 per acre.

As a result of the lava flow, 50 acres of land adjacent to the seashore, which was in the process of becoming a beach subdivision, was completely eliminated and it is the opinion of the writer that this project had a minimum value as a subdivision of 10 cents a square foot, or \$4,000 per acre.

The total loss in the Kapoho area as noted in the attached report was \$2,546,901. The biggest individual loss was in the loss of revenue that would have accrued to the Territory during the years 1955 and 1956. The figure of 13,063 tons of sugar would have brought a total revenue of \$1,716,478. This figure is based on an average return figure of \$131.40, which would have included sugar at \$116 per ton, the benefit payments that would have accrued, and for molasses payments.

The total loss in the Opihikao area was \$745,102. In this area, 114 acres of cane land was completely covered by lava and 56 acres has been abandoned owing to difficulty of egress and ingress. In this particular area, 240 acres of coffee and other crops valued at \$500 an acre has been completely eliminated.

The biggest individual loss in this area was the loss in revenue from sugar that will not be sold. The sugar loss was 2,823 tons valued at \$131.40, or a loss of revenue of \$370,942.

The total loss within the entire area of Kapoho and Opihikao would amount to \$3,292,003. However, we estimate that the insurance recovery will be in the neighborhood of \$725,000 for the standing sugarcane that was burned or covered by lava. Therefore, the total estimated loss to individuals will be \$2,567,003. Added to this loss is a figure of \$280,000, which is the estimated loss

to the Government for roads covered by lava. The total of our estimated losses, both personal and governmental, is \$2,847,003.

In filing this report, the committee as mentioned in the first paragraph wishes to reiterate their expression of gratitude for the work of the fact-finding committee, but feel that the magnitude of the destruction caused by the recent lava flow is such to warrant our expression as to the direct losses suffered by the 120 individuals in the Puna area and indirect losses to the remaining 7,000 citizens of the district.

The committee feels that if there are any questions about information included herein, it will be willing to meet with you or your committee to discuss them.

Very truly yours,

RICHARD LYMAN, Jr.

TABLE 44.—*Estimated loss, volcanic damage in Puna area, as of Apr. 9, 1955*

	Value per acre	Acres covered by lava	Value of land
<b>Kapoho:</b>			
Cane land.....	\$340	471.51	\$160,313
Roads.....	120		55,581
Stool.....	150		70,727
Leveling.....	60		28,291
A abandoned cane land.....	330	185.79	61,311
Papais land and crop.....	1,000	100.00	100,000
Homes (6).....	300	300.00	90,000
Forest.....	232	1,000.00	233,200
Waste, 50 acres, beach; 950 acres at \$35.....			10,000
Connecting roads.....			
Subtotal.....		2,057.30	830,423
13,063 tons sugar (131.40) (including CC payments and molasses).....			1,716,478
<b>Total.....</b>		<b>2,057.30</b>	<b>2,546,901</b>
<b>Ophihikao and others:</b>			
Cane land.....	340	114.00	38,760
Roads.....	120		13,680
Stool.....	150		17,100
Leveling.....	60		6,840
A abandoned cane land.....	330	56.00	18,480
Coffee land and crop.....	500	240.00	120,000
Homes (5).....	300	544.00	15,000
Forest.....			144,300
<b>Total.....</b>		<b>954.00</b>	<b>374,160</b>
2,823 tons sugar (181.40) (including CC payments and molasses).....			370,942
<b>Total.....</b>		<b>954.00</b>	<b>745,102</b>
<b>Grand total.....</b>		<b>3,011.30</b>	<b>3,292,003</b>

<sup>1</sup> Some acreage valued at \$200.

#### SUMMARY

Loss, other than sugar.....		\$1,204,583
Sugar loss (raw-sugar value).....	\$2,087,420	
Less estimated insurance recovery.....	725,000	
		1,362,420
Subtotal estimated loss.....		2,567,003
Total Government roads.....		290,000
<b>Total estimated loss.....</b>		<b>2,857,003</b>

Dr. Macdonald notes that no official figures are yet available covering the losses from March 28 to May 26. Unofficial estimates from the Puna Cane Planters Association and others has placed the total loss from the 1955 flow at a net of \$2,602,000 after recovery of insurance benefits of about \$725,000. This figure is arrived at as shown in table 45.

TABLE 45.—*Loss estimate for 1955 eruption of Kilauea*

To May 22, 1955:	
Raw sugar losses .....	\$2, 087, 420
Losses other than sugarcane .....	1, 204, 583
May 22-26: All losses .....	35, 000
Estimated gross loss .....	3, 327, 003
Less insurance recovery on raw sugar losses .....	725, 000
Estimated net loss .....	2, 602, 003

Dr. Macdonald notes the estimates in table 45 run appreciably higher for losses during the early part of the eruption than do the estimates made by the PVFF Committee (appointed by Governor King). He was in no position to evaluate the relative accuracy of the various figures used.

Dr. Macdonald obtained independently the following estimates of damage from the 1955 eruption:

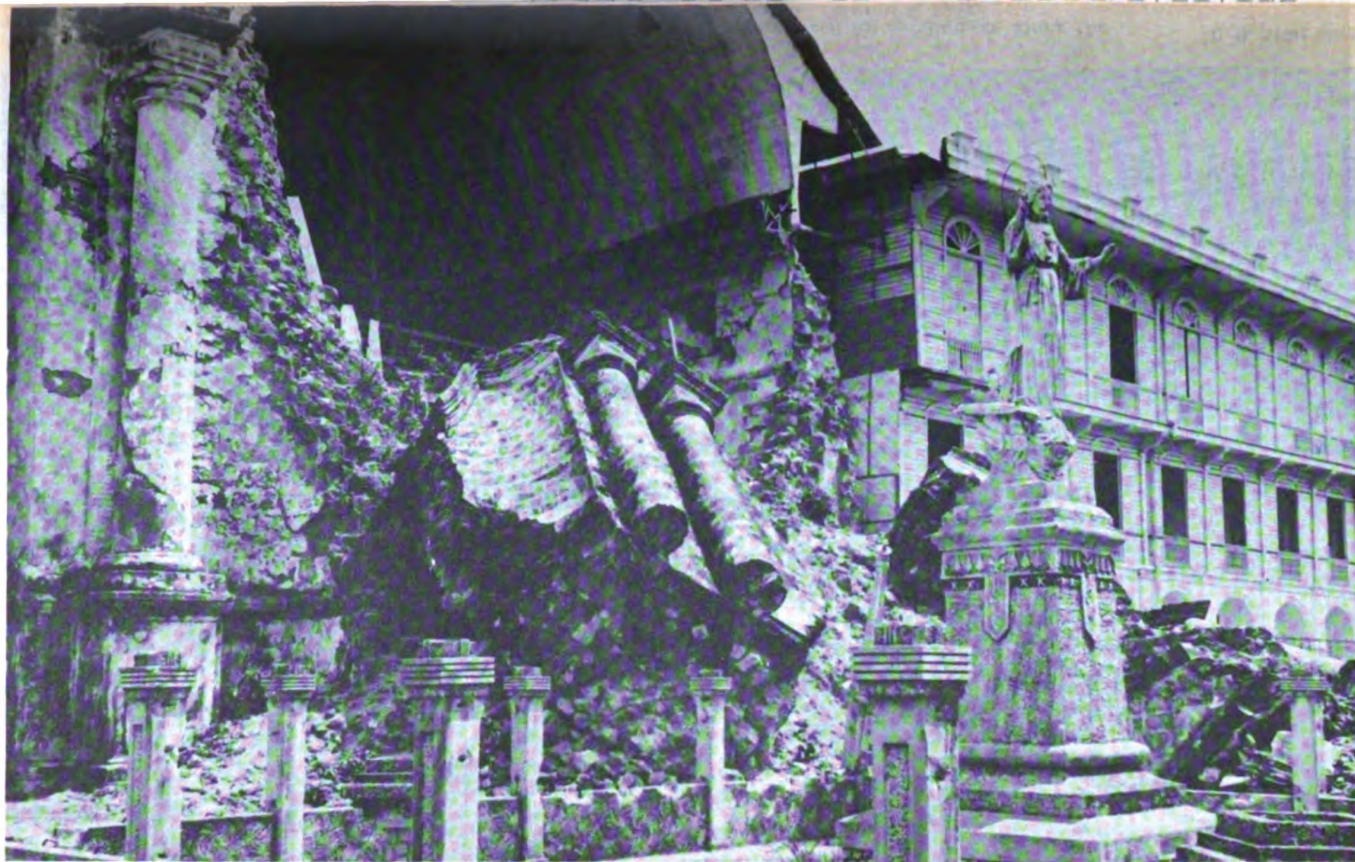
Approximate cost of replacing public roads with temporary cinder surfacing (per County of Hawaii Engineer's Office, partly estimated, as work still in progress) .....	\$106, 800
Estimated cost of permanent surfacing of county roads .....	125, 000
Estimated cost of replacing 4 miles of Territorial Pahoa-Kalapana road with new permanent alinement (per Territorial highway department) .....	350, 000
Insured losses (per Board of Underwriters of Hawaii) .....	950, 000

He noted final valuations of candeland destroyed are unavailable because they are now being compiled. Olaa Sugar Co., Ltd., Olaa, Hawaii, is expected to have them soon.

*Alaska and the Aleutians.*—From the many eruptions in the Alaskan area previously listed in this study the greatest amount of property damage was inflicted by an ash fall of about one-fourth inch in July 1953 from an eruption of Mount Spurr (its first since recorded observations began in 1760). This damage probably amounted to thousands of dollars, although no more precise estimate is available. Damage was incurred by national defense establishments and civilian communities near Anchorage. The village of Akutan also probably experienced slight damage from several light ash showers from Akutan volcano in 1931 and 1946 and in each of the years from 1948 to 1954, inclusive. However, the exact amount was not recorded.

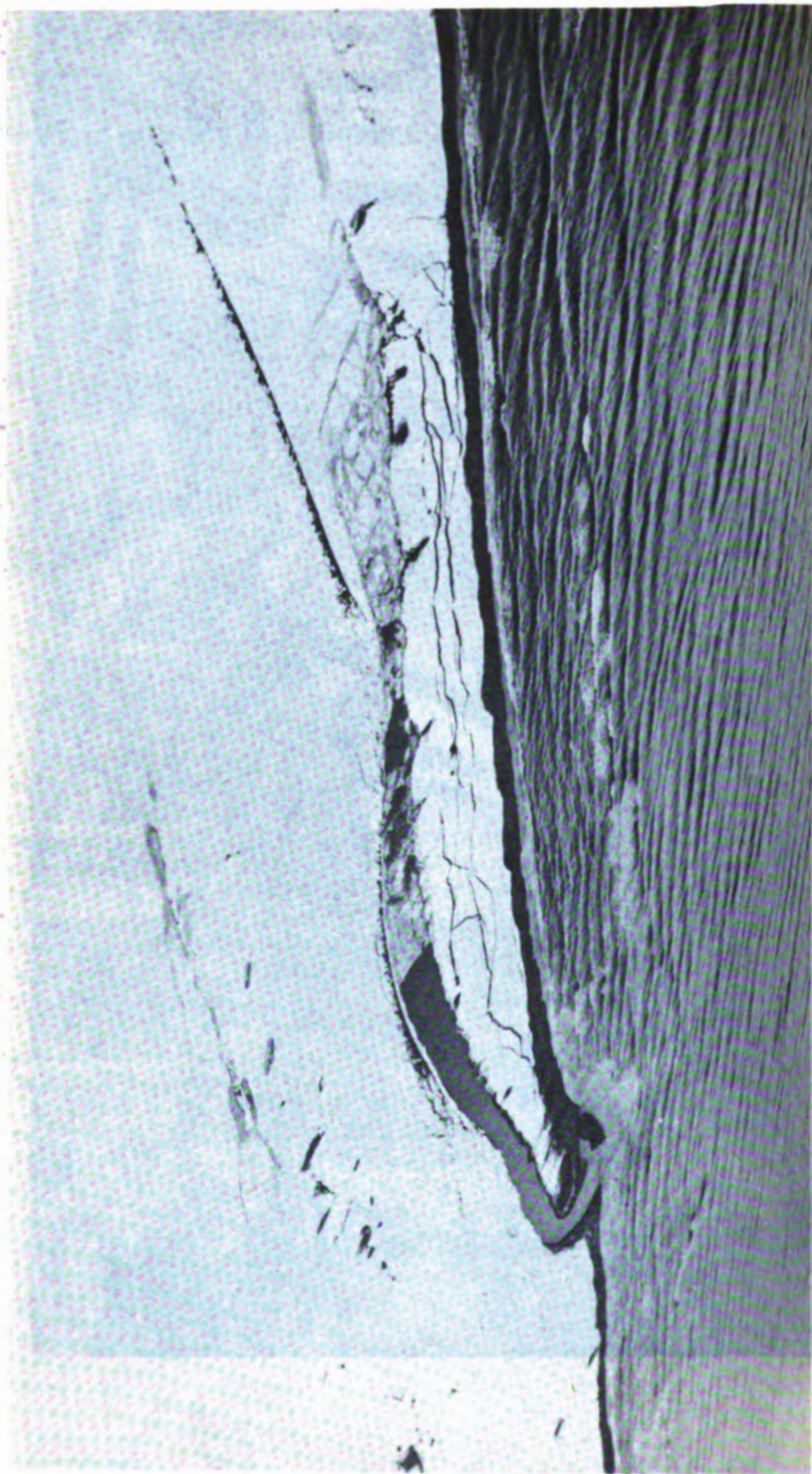
The only recorded loss of life from volcanic eruption in the Alaskan area occurred when one serviceman was killed during the 1944 ash shower from Cleveland Volcano.

As noted by the Geological Survey, the lack of damage from other eruptions in the area is due to absence of property development. It expresses the opinion that if the volcanic regions were inhabited, a large proportion of the eruptions would have caused damage.



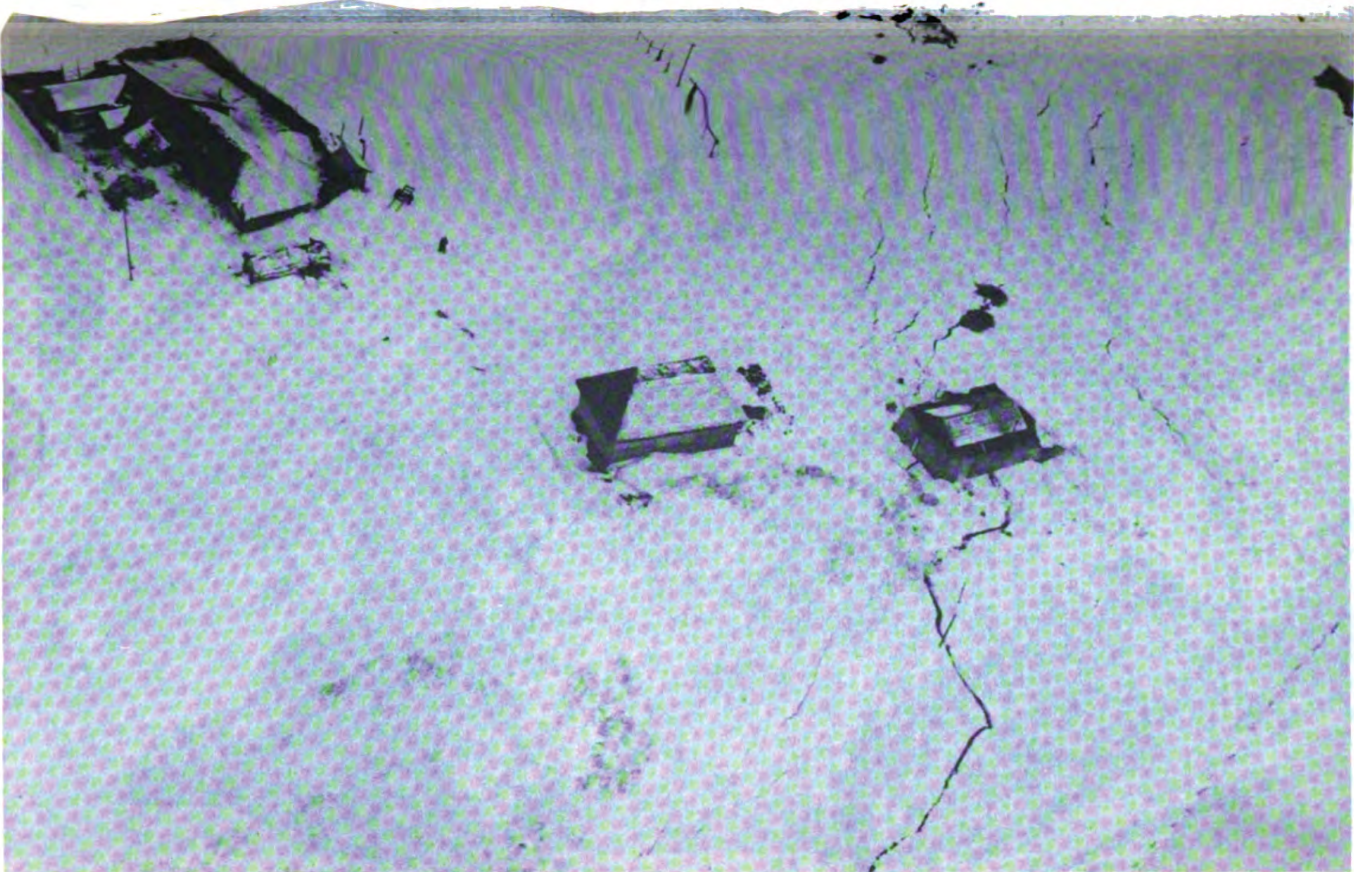
**EARTHQUAKE.**—Luzon, Philippine Islands. Emaculate Conception Church constructed in 1776, Batangas. This photo shows a large block of stone that fell from the front of the church during an earthquake on May 8, 1942.

U. S. Army photo



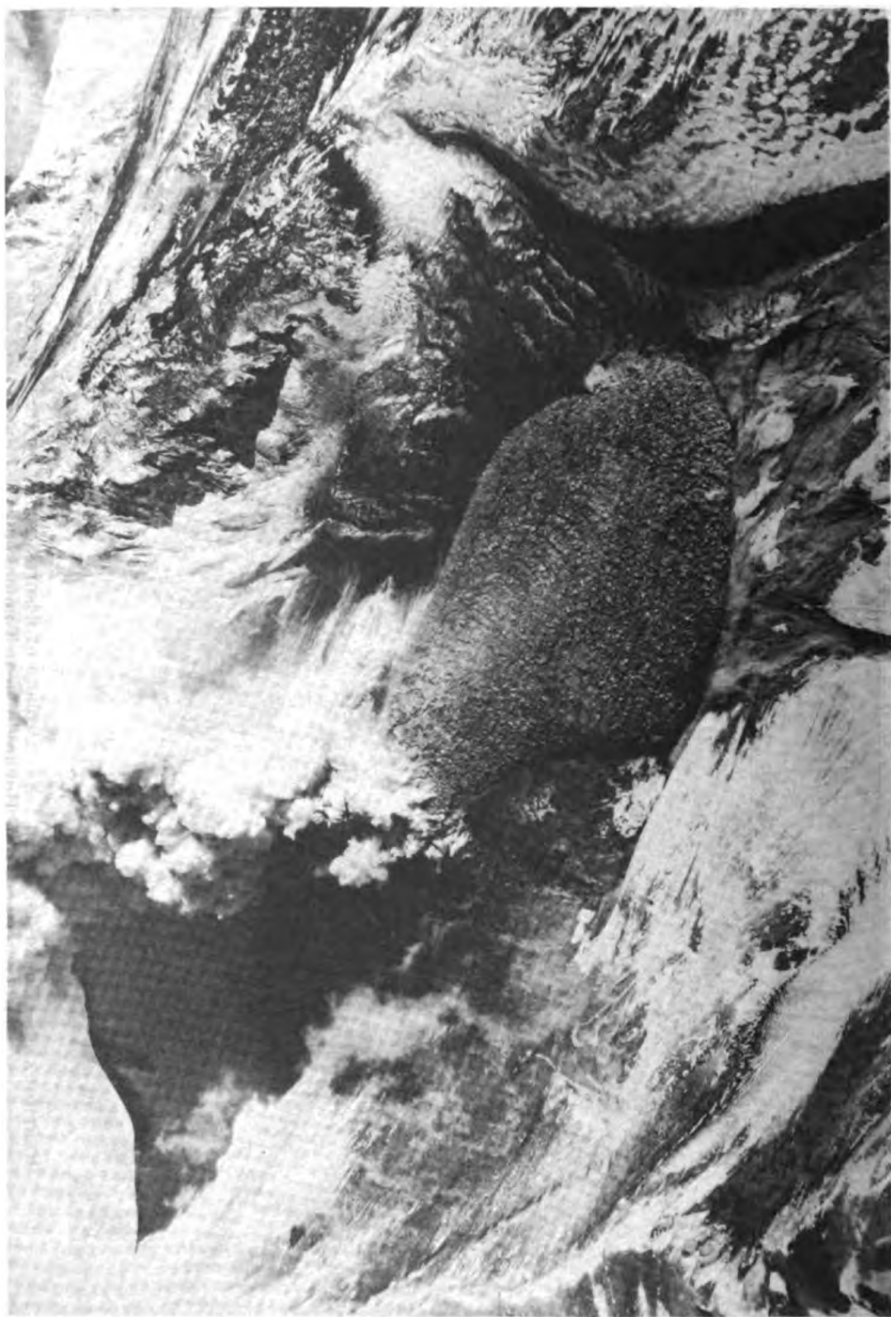
EARTHQUAKE.—Hokkaido, Japan. Aerial photo of fissures caused by earthquake along the southeastern coast of Hokkaido, near Tomakomai. March 5, 1952.

U. S. Army photo



**EARTHQUAKE.**—Hokkaido, Japan. Aerial photo of fissures caused by earthquake along the southeastern coast of Hokkaido, near Tommakomi. March 5, 1952.

U. S. Army photo



U. S. Navy photo

Close-up view of the hot bed of lava taken Saturday, February

1942, near Unalakleet, Alaska



**VOLCANO.**—Kodiak, Alaska. Billowing clouds of sulfurous smoke and steam pour out of the active fissure on the southwest wall of Trident Mountain, Saturday, February 21.

U. S. Navy photo



VOLCANO.—Kodiak, Alaska. This picture taken Saturday, February 21, facing northeast shows both Mount Magellik (foreground) and Trident Mountain (in background).

U. S. Navy photo



VOLCANO.—Oahu, T. H. Lava flow crosses the road in the Puna district of Hawaii, March 1955

U. S. Army photo



Volcano.—Oahu, T. H. Recently cooled lava, near Kalapana on the Island of Hawaii.  
March 1953.

U. S. Army photo  
No. 2





## VI. TECHNOLOGICAL DISASTERS

### AIR POLLUTION

For the purposes of this study, discussion of air pollution will be confined to smog and radioactive materials as pollutants.

#### SMOG

The general designation "smog" is used to refer to impure polluted air. The chemical composition of such air is not uniform; it varies with the nature of the pollutant. For example, the area of the United States most bothered by smog recently is Los Angeles, Calif. As petroleum is widely used as a fuel there, rather than coal, the composition of gases entering the air differ from those in predominantly coal-burning areas.

The United States Public Health Service is currently embarking on intensive research of the smog problem. As part of this effort, it is collecting for analysis air samples from some 30 communities in the United States. Samples of air collected from near the ground at widespread points over the world have proved to have a remarkably uniform mixture of the permanent constituents, even where these are present in minute proportions. According to the *Encyclopaedia Britannica*, about 78.09 percent of a given sample of air is nitrogen and 20.95 is oxygen. The rest of the sample contains argon, carbon dioxide, neon, helium, krypton, xenon, ozone and radon. Atmospheric impurities complicate the situation, however. These frequently are products of combustion or decomposition. It is believed possible that air pollution may have occurred often in localized areas in the past, but escaped scientific attention due to lack of research facilities. Even as late as 1954, the Public Health Service had only a few tens of thousands of dollars available for smog research. This very committee dealt with the problems of air pollution through smog in the course of acting on housing legislation in 1954 and 1955, although no appropriate provision became law. However, with the enactment into law of Public Law 159 during the 1st session of the 84th Congress in 1955, appropriations were authorized for the purpose of conducting smog research. The staff of the committee has been advised that \$1.8 million is now available for that research; so that for the first time, the Public Health Service can make more than a perfunctory approach to the problem.

Fortunately, the existence of serious smog conditions in areas under the jurisdiction of the United States is comparatively rare. In the late 1940's a condition of air pollution afflicted Donora, Pa., and was suspected to be a contributing cause of an increase in the mortality rate. Other annoying incidents of severe air pollution have occurred in France in the third decade of this century. In Mexico about 1940, during fumigation of an oil-producing area, hydrogen sulfide fumes were accidentally released. As a result many persons in the area took ill or died. In 1952 England had a serious spell of air pollution. It

was said that some 4,000 persons died earlier than would have otherwise been the case. For the past several years, the Los Angeles, Calif., area has been sporadically plagued by smog. The most recent visitation occurred during a late summer heat wave. Certain California laws designed to lower the amount of products of combustion entering the atmosphere were brought into use.

#### PREDICTABILITY

Public Health Service representatives believe that prediction of the frequency or incidence of smog attacks is extremely difficult, if not impossible. At present, research efforts are in such an early state that few conclusions are available. More research is required to determine the degree to which air pollutants contribute to disease. The recent Los Angeles attacks caused considerable eye irritation. More research is also needed to determine what part smog plays in property damage. It is known that some air pollutants are corrosive in character. Gases entering the atmosphere may combine with moisture to form acids. Much still remains to be learned about their effect upon metallic surfaces.

#### DAMAGE

To date the observed effects of smog are its contribution to personal injury and illness and its suspected role as a contributing cause of death. Research should provide a better understanding of the nature of smog and its evil effects as well as preventive or remedial measures for the problems it creates.

#### RADIOACTIVE MATERIALS

As is true in the case of smog, there remains much to be learned about the effects of radioactive materials entering the atmosphere. But even with the limited knowledge available as to both substances, it seems clear that the effects of air pollution through radioactivity are by far the more evil of the two. All too little is known of the effect of radioactivity upon inanimate objects. The comparatively slight fund of knowledge concerning the effect of varying amounts of radioactivity upon human beings appears to be inadequate from which to draw irrefutable conclusions. At the upper level, it seems clear that large doses will result in death. At the other end of the scale, learned authority believes that minor doses of radioactivity are being satisfactorily absorbed by the human system, even as they were before man ventured into the realm of nuclear fission. It is the middle ground that causes men to differ. Among representatives of the United States Atomic Energy Commission there are those who believe present-day man is in no serious danger of air pollution due to radioactive materials. This view takes note of the increase in experiments with nuclear fission during the past decade, both for military and civilian purposes. Especially as applied to the quite recent development of atomic energy for peaceful uses, it is argued that man's knowledge of means of controlling such energy advances apace with his knowledge of means of applying such energy to industrial and commercial uses.

To date, only a single known accident has happened in the use of an atomic reactor, with a resulting escape of radioactivity to an unex-

pected area. In 1952 a crack developed in the reactor at the Chalk River atomic pile in Canada, through which a stream of neutrons escaped to contaminate the plant with radioactivity. Attempts at decontamination closed the plant for 3 months after the accident. According to published accounts, no harm was done to personnel at the plant, the radioactivity was brought under control, and nearly all escaped radioactive water was recovered. In the isolated community of Chalk River, no damage appears to have resulted from the accident.

But the Chalk River incident has proved the none-too-startling fact that accidents can happen in the use of atomic energy for peaceful purposes.

Moreover, the lingering and cumulative effects of radioactive contamination are well enough known to cause men to worry about increasing the amount of radioactivity introduced among them in their everyday lives. We need go back into history only a few years to recall the fate of workers using luminous paint. At first unknown to them, they were afflicted by "radium poisoning"—actually an absorption of radium into the bony tissue with resulting cancer of the bone for many. More recently, a staff member of the National Cancer Institute at Bethesda, Md., has concluded that by 1953 lung cancer had killed 40 to 50 percent of the uranium miners in Joachimsthal and from 75 to 80 percent of the miners in other radioactive mines in Schneeberg in central Europe, according to an article entitled "The Menace of Radiation" by Prof. N. J. Berrill, of McGill University, appearing in the October 1955 issue of the *Atlantic Monthly*. Professor Berrill notes that inhaled radioactive dust would bombard lung linings as unremittingly as radium bombards bone cells. This professor of zoology raises a note of warning that nuclear power reactors are more hazardous than other machines because they contain radioactive materials and fission products including radioactive chemicals lethal if inhaled or swallowed. If the reactor core should accumulate enough fissionable material to blast, not only would the plant be wrecked but a fission product cloud escaping from the plant would act as a restricted scale fallout from an atomic bomb.

The long-range genetic effects of radioactivity upon humans are also subject to dispute.

In brief there seems to be no widely accepted agreement concerning the exposure to risk caused by atomic reactors. Even the effect of the March 1954 fallout of radioactive dust from the Bikini explosion on the fishermen in the boat *Fortunate Dragon* is still debated by men of learning. No unanimity of opinion seems to exist regarding the cause of death of one of these victims of radioactive fallout.

Under such circumstances it might be wondered whether such risks as exist may prove to be insurable. On this point, interim conclusions of representatives of the fire and casualty insurance industry are encouraging. Whether these optimistic conclusions can be translated into commercial practice by offering adequate coverage in aggregate amounts desirable in the public and private interest at acceptable premium rates remains to be seen. The Atomic Energy Act of 1954 opened the door to development of privately owned industrial atomic installations. Upon passage of that act, insurance company representatives approached the Atomic Energy Commission in order to equip themselves to deal with insurance problems raised by this de-

velopment. As a result, the Atomic Energy Commission appointed an insurance study group in March 1955. This group consists of representatives of the fire and casualty insurance industry. Three tasks were assigned to it:

1. Review insurance problems accompanying expansion of industrial participation in atomic energy.

2. Develop information and criteria about insurability of industrial atomic energy installations and undertakings.

3. Make appropriate recommendations to the Commission, including any necessary specific legislation.

In an interim report signed by 10 members of the group and disclosed by the Commission on July 13, 1955, it was concluded that the catastrophe potential from industrial atomic installations is more serious than any known in industry, but the possibility of serious catastrophe seems very remote. The report appears in appendix A, page 132. Substantial progress in developing controls to prevent a dangerous incident and the development of features for containing the results of a reactor failure if such an incident nevertheless occurs are two reasons cited for catastrophe remoteness.

In the interim opinion of the group, adequacy of commercial insurance will vary with the type of insurance. It is deemed sufficient to cover against physical damage the atomic reactor plants themselves and their machinery, as well as public liability and workmen's compensation liability as to reactor employees, to the extent these perils are now offered for quite hazardous operations.

But if the reactor is near large industrial plants, their increased exposure may exceed the capacity of the insurance industry to insure. Reactor failure causing radioactive contamination of machinery and equipment and the buildings containing them (as distinguished from physical damage) presents new hazards requiring study. Likewise, loss-of-use insurance is so akin to a guaranty of successful operation that any amount available will be limited during the early development of industrial atomic power. Workmen's compensation liability for employees in plants other than reactor plants presents a problem when air or water supply is contaminated by fission products, threatening a catastrophic loss. Third-party liability insurance presents the most serious problem of all, due to the very high aggregate dollar value of claims arising from a catastrophic accident. These claims could be made directly by the victims or as subrogation actions by insurers paying the loss in the first instance. To consider only two instances, catastrophic claims could result by way of subrogation from property loss or decontamination costs paid by property insurers or workmen's compensation losses due to injuries to workers in plants near the offending reactor plant. Claims against a manufacturer of a reactor's component part alleged to be defective could equal the entire monetary damage assessed by the courts for loss of life, injury, or property damage due to such a defect.

The group concluded that the insurance market should be expected to increase its capacity with an increase in knowledge of the basic hazards involved in the power reactor development program, now largely experimental. Continued liaison at the engineering level between AEC and the insurance industry is recommended to obtain broader knowledge of hazards, confidence regarding insurance offered against them, and evaluation of new risks. The group calls absolutely

necessary the continuance of the Reactor Safeguards Committee or some similar body and the requirement for stringent safety standards as a condition precedent to licensing operation of atomic reactors under the Atomic Energy Act of 1954. The group expresses a belief that the insurance industry can work out an aggregate limit of liability for all interested parties substantially equivalent to those normally needed by other major industrial enterprises. It recommends it be continued for further studies and reports.

The optimism of the insurance industry in this field in contrast to its seeming pessimism regarding the commercial possibilities of flood insurance may stem in part from the following. In industrial atomic installations, the catastrophe possibilities are high but the expected incidence rate of such catastrophes is low. Since many reactor managers will be exposed to risk but few will collect reactor insurance benefits at any time, reserves deemed adequate can be built. By contrast, current thinking of the insurance industry relative to flood insurance is that the catastrophe possibilities are high, and the expected rate of incidence is also high, making herculean the task of building up adequate reserves to cover losses. Insurance organizations presently fear that flood insurance falls within the classification of high-incidence, high loss. Reactor insurance is expected to have low-incidence, high loss. Conversely, workmen's compensation liability insurance has high-incidence, low loss. The latter two are consequently deemed commercially insurable, but insurance companies retain grave doubts regarding the commercial feasibility of flood insurance.

Other comments made by the insurance study group in its interim report to the AEC are equally applicable to consideration of the feasibility of flood or disaster insurance. The group notes that the American fire and casualty insurance market is composed of a substantial number of independent competing companies, whose officials have a trust obligation to their policyholders or stockholders, or both. Many such companies are classified as small and many operate in specialized fields. Statutes add emphasis to the insurance official's duty to safeguard company funds by spreading risks as widely as possible and by limiting loss in a single catastrophe. Findings of the insurance study group have no binding effect on the many independent insurance companies comprising the fire and casualty insurance industry.

Serving as a liaison group between the Federal Government and the commercial insurance market, the insurance study group defines its problem as bridging the gap between past complete Government risk-assumption in the field of atomic energy and future requested assumption of risk by private industry and insurance against such risk by private insurers. In the field of flood insurance, Government has shared, rather than monopolized, the assumption of risk. But the problem of bridging the gap between this situation and one in which the risk is insured by private insurers is one calling for study by insurance groups in the case of flood and disaster insurance.

In its interim report on industrial atomic installations, the insurance study group noted that the various segments of the fire and casualty insurance industry have been alerted to problems connected with such installations. It further noted that a number of insurance organizations have committees currently considering problems such as the

development of the capacity and evaluation of new hazards incidental to nuclear power. There is a vital need for similar alerting of insurance companies and study by them in the case of flood and disaster insurance.

Finally, the insurance study group disclaimed any responsibility for determining whether legislation should be proposed whereunder the Government might assume liabilities in excess of those normally covered by insurance in other major industrial activities. Calling this a matter of public policy for the Commission and the Congress to decide, the group offered to suggest practical methods of procedure if the Government decides to assume such excess liabilities. In this respect, its position is similar to that taken by certain insurance representatives regarding flood or disaster indemnity. These representatives have stated the insurance industry will be willing to sell Government indemnity agreements and assist in adjusting claims under such agreements similar to such activities by private insurance organizations in connection with the operation of the War Damage Corporation insurance program, during World War II.

Whether this willingness extends to participation in a reinsurance program like that operated for plate glass hazards by the War Damage Corporation remains to be seen. Informally, there presently seems to be a difference of opinion within the insurance industry on this score. Some fear that Government payment of claims by ceding companies obtaining reinsurance would not be rapid enough to solve the insurer's problem of raising large sums of money with which to pay catastrophic losses. It would seem possible to overcome the greater part of this fear by reserving to the insurer the right to pay claims in stages in the event of catastrophic losses, a procedure adopted in payment of claims by the Philippine War Damage Commission. Others have expressed hesitancy about issuing flood or disaster insurance policies in the name of private insurance companies lest, their worst fears that the program would be a failure being realized, the resulting public doubt of the worth of the program might translate itself into loss of confidence in commercial insurance in other fields, with adverse business effects on private insurance organizations. This fear is based on a doubt as to the feasibility of flood insurance. Unfortunately, whether or not it is justified apparently could be truly tested only by the trial and error method of an operating program.

It is this particular fear that leads insurance organization representatives to recommend that the word "insurance" not be used to identify any program of Government payments to disaster victims which may prove to be non-self-supporting. They are fearful that a public not fully aware of the difference in attributes of a self-supporting insurance program and a non-self-supporting indemnity program might couple any failure of the latter with a loss of confidence in the former. Differing from Shakespeare's evaluation of semantics in *Romeo and Juliet*, they believe there is much in a name if that name be insurance.

This problem, however, can be easily overcome by use of an alternative designation for the program, whether that be a closely related word such as "surance" or a different appellation such as "indemnity." The more important problem seeking solution is the search for a way to indemnify disaster victims in general on a prepaid, self-help basis. It is to be hoped representatives of the insurance industry will devote

themselves to a solution of this broad problem with the same dedicated spirit shown in their approach to the problem of insuring against the effects of radioactive contamination, which constitutes only a single segment of the entire field of disaster.

#### PREDICTABILITY

Due to present lack of agreement among eminent authorities, it does not seem practical to forecast the degree of exposure to risk to which persons and property will be subjected by radioactive contamination of the atmosphere. Atomic power reactors for industrial use are still largely in the experimental stage.

#### DAMAGE

On this point again there is dispute. Potentiality of damage from radioactive contamination is universally admitted. But the degree of atmospheric contamination from radioactivity is still a subject of debate.

#### EXPLOSIONS

Like fire, explosions are both good and evil, depending upon the circumstances under which they occur. In controlled state, they act as servants of man propelling his engines, moving his motor vehicles, and activating his rifles and guns.

But it is the evil aspects of explosions with which we are presently concerned. When accumulated gases or fuel explode at undesired times, serious injury to person and damage to property may, and often does, result. No part of the United States or its Territories is immune to accidental explosion. Despite increasing safety measures applied to modern machinery, accidental explosions still occur. Recalling a few instances at random, the Texas City, Tex., explosions during ship-loading caused damage of catastrophic proportions; the explosion and fire aboard the United States aircraft carrier *Bennington* off Rhode Island in 1954 resulted in the death of 99 and injury to 201 men; and, as recently as August of this year, an explosion and fire at the Standard Oil Co. refinery at Whiting, Ind., caused considerable property damage. With little difficulty, it would be possible to find destructive accidental explosions in all parts of the Nation. Some are of such force as to register on seismographs normally used to register earthquakes.

#### PREDICTABILITY AND WARNING

These are features generally inapplicable to accidental explosions. Because of the rapidity of events constituting the explosion, little advance notice is possible. After an initial explosion, it is sometimes possible to predict the occurrence of other explosions in the area, and adopt available precautionary methods. Preventive measures include constant inspection of machinery in which an explosion might develop, and maintenance of all parts in good working order, making replacements where deemed necessary. In addition, safety practices are prescribed for the proper use of fuels and other gaseous materials that may become explosive unless adequately safeguarded in use.

## DAMAGE

Due to the large number of accidental explosions that occur annually, property damage statistics range from numerous small amounts to a few catastrophic amounts. Because widespread insurance programs are available to cover losses due to this source, it is deemed inadvisable to go into further detail regarding damage in the present discussion of explosion as a type of disaster.

## APPENDIX A

## PRELIMINARY REPORT OF THE INSURANCE STUDY GROUP TO THE ATOMIC ENERGY COMMISSION

## I

The insurance study group, consisting of representatives of the fire and casualty insurance industry, was appointed by the Atomic Energy Commission in March of this year for the following stated purposes:

- (a) To review insurance problems created by expanded industrial participation in atomic energy;
- (b) To develop information and criteria with respect to the insurability of industrial atomic-energy installations and undertakings; and
- (c) To make appropriate recommendations to the Commission including any specific legislation that may be considered necessary.

## II

The questions posed to the group by the Commission involve to a substantial degree the question of the availability of commercial fire and casualty insurance for industrial atomic installations, and in order to give the Commission a background of the interim conclusions reached by the group, it seems appropriate to outline certain fundamentals of this commercial insurance market.

(a) The American fire and casualty insurance market is made up of a substantial number of independent competing insurance companies, the officials of each company being responsible to their stockholders and/or policyholders for the funds entrusted to their care. Many of these companies are small, many operate in specialized fields, and many have little or no experience with industrial insurance hazards.

(b) The assets of insurance companies to a major degree represent funds held in trust by the insurance companies for the protection of their millions of policyholders. Officials of insurance companies have a duty, reinforced by statutory mandate, to safeguard the funds entrusted to their care for the protection of policyholders by spreading their risks as widely as possible and limiting the amount of loss which they can sustain in any one catastrophe.

(c) Insurance company managements broadly speaking have a very limited knowledge of the perils involved in industrial atomic installations. Their lack of knowledge in this respect arises from the fact that they were not in a position to evaluate or to insure such hazards prior to the enactment of the 1954 act. Upon the enactment of the Atomic Energy Act of 1954, the insurance companies approached the Atomic Energy Commission for the purpose of equipping themselves to deal with this problem. Through the interest and cooperation of the Commission, the insurance study group was appointed.

(d) The insurance study group believes that one of its principal functions is to attempt to serve as a liaison group between the Government and the commercial insurance market. The problem is to bridge the gap between complete Government assumption of risks in this field in the past, and the future in which private industry is asked to assume this hazard and private insurers to insure it. Therefore, while the study group can submit recommendations, they are not in a position to commit the many independent insurance companies without their consent.

## III

Within the foregoing framework, the insurance study group has reached the following interim conclusions:

1. The catastrophe potential, although remote, is more serious than anything now known in industry.

2. The possibility of a serious catastrophe seems very remote because of:

(a) Substantial progress made in the development of controls to prevent a dangerous incident, and

(b) The development of features for containment of the results of a reactor failure should the multiplicity of controls all fail.

3. The insurance capacity for the physical hazards as now applicable to more hazardous types of chemical operations appears to be adequate to cover atomic reactor plants. If, however, the reactor should be located in proximity to large existing industrial plants, the increased exposure of the latter may be beyond the capacity of the insurance industry. This question will require further study.

4. Physical damage losses to reactors and machinery incidental to atomic power-plant installations can probably be handled in the same way that boiler and machinery coverage on extrahazardous machinery is now handled in other industries. Radioactive contamination of machinery and equipment and the containing buildings resulting from reactor failure presents new hazards requiring further investigation by the insurance industry to determine the nature and scope of coverage that can be afforded.

5. We believe that insurance against loss of use frequently purchased in connection with boiler and machinery or other physical damage insurance presents a difficult insurance problem during the period of early development of industrial atomic power. Such insurance is, in effect, a guaranty of successful operation and it is believed that if any such protection is available it will be somewhat limited in amount.

6. The workmen's compensation hazard for employees engaged in the operation of reactors and auxiliary equipment can be handled by existing insurance facilities. The major catastrophe problem in this connection is with respect to employees of other plants in which the air or water supply might become contaminated by fission products.

7. The public liability hazards resulting from damage to persons or property and arising from the manufacture, construction, ownership, or operation of power reactors can be insured by existing insurance facilities up to the limits of liability normally available to more hazardous types of industrial enterprises.

8. In order to promote the insurability of such enterprises and increase insurance capacity, it is believed absolutely necessary that the present Reactor Safeguards Committee or a similar committee continue to function and that stringent safety standards be maintained as a condition precedent to licensing under the 1954 act. This would involve periodic inspection as to compliance as a condition for the continuance of the license.

9. Broader knowledge of the hazards and confidence with respect to their insurance can be built up by continuing program of liaison between the insurance industry and the Atomic Energy Commission at the engineering level, which will also serve in the evaluation of new risks.

10. The present power reactor development program is largely experimental, which materially complicates the insurance problem in a new hazard. As knowledge of the basic hazards involved increases, the insurance market should be expected to increase its capacity.

11. The most serious problem as to the amount of insurance available lies in the field of third-party liability insurance. This problem arises from the very high aggregate dollar amount of claims which might arise in the event of a possible, though not necessarily probable, catastrophic accident. Such claims might be made directly by the person suffering injury or loss, or they might arise as subrogation actions on the part of insurers called upon to pay the loss in the first instance. Claims for property loss or decontamination paid by property insurers, or workmen's compensation losses arising from injuries to employees in neighboring plants illustrate the subrogation problem and either might be of catastrophic proportions.

In addition to the operator of an atomic-energy plant, claims may be brought against any manufacturer of a component part of the installation which part may be alleged to be defective. Under the circumstances there might flow into the liability insurance market from a single accident claims aggregating the total monetary damage assessed by the courts for loss of life, injury, or damages to property.

Notwithstanding these complications, it is believed that the insurance industry can work out an aggregate limit of liability for all parties at interest substantially equivalent to those normally required by other major industrial enterprises.

#### IV

The various segments of the fire and casualty insurance industry have been alerted to the problems in connection with insurance of industrial atomic installations. A number of insurance organizations have committees currently giving consideration to such problems as the development of capacity and the evaluation of the new hazards incidental to nuclear power.

#### V

It is not the function of the Insurance Study Group to determine whether or not legislation should be proposed under which the Government might assume liabilities in excess of those normally covered by insurance in other major industrial activities. This would appear to be a matter of public policy, and the responsibility of the Commission and of the Congress. The group is prepared, however, to suggest practical methods of procedure in the event the governmental decision to this question lies in the affirmative.

#### VI

In view of the limited time which has been available and in view of the rapidly expanding knowledge and development in this field, your group recommends that its activities be continued in order that it may engage in further studies and make further reports to the Commission.

#### VII

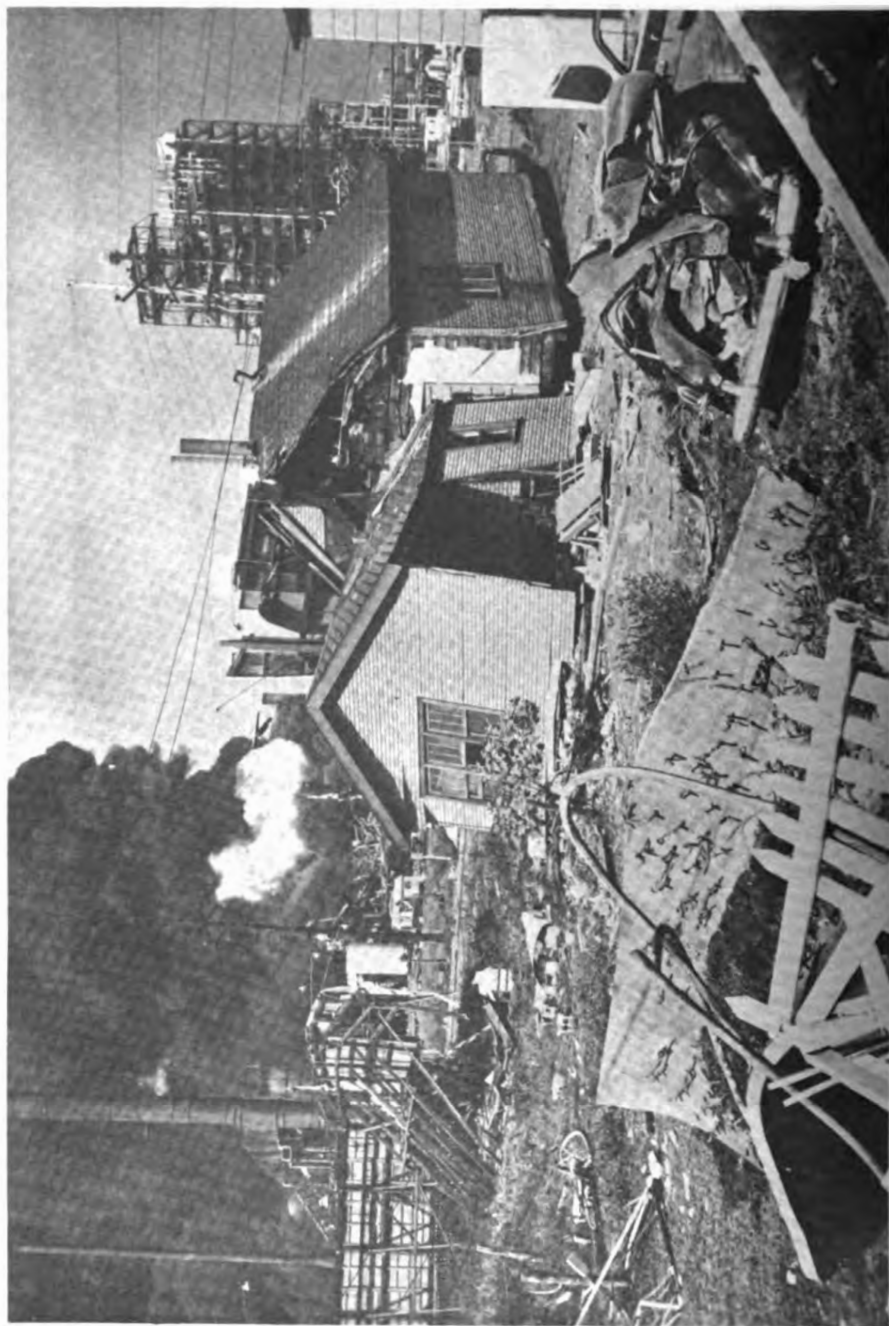
In conclusion your group wishes to record its appreciation of the outstanding cooperation it has received from officials and employees of the Commission at all levels, and from the various private contractors currently operating Commission facilities. The task which we have undertaken would have been impossible of prompt performance without such help which has been given wholeheartedly. In particular, we would like to refer to the cooperation and imagination shown by the two permanent officials of the Commission who have been acting as the immediate liaison between the group and the Commission personnel in general. We believe that their activities warrant special commendation.

K. E. Black, president, Home Insurance Co.; Donald H. Burr, secretary, Aetna Casualty & Surety Co.; Percy Chubb, president, Federal Insurance Co.; Charles J. Haugh, vice president, Travelers Insurance Co.; Manning W. Heard, first vice president and general counsel, Hartford Accident & Indemnity Co.; A. B. Jackson, president, St. Paul Fire & Marine Insurance Co.; H. C. Jones, president, Arkwright Mutual Fire Insurance Co.; A. L. Papenfuss, vice president, Employers Mutual Liability Insurance Company of Wisconsin; M. B. Weber, vice president, Lumbermens Mutual Casualty Co.; H. W. Yount, vice president, Liberty Mutual Insurance Co.



Chicago Tribune  
photo

EXPLOSION.—Standard Oil refinery fire and blast, September 1955. Whiting, Ind.



Explosion.—Standard Oil refinery fire and blast, September 1955. Whiting, Ind.

Chicago Tribune  
photo



Chicago Tribune  
photo

EXPLOSION.—Standard Oil refinery fire and blast, September 1955. Whiting, Ind.



LANDSLIDE.—Korea. Torrential rains in the Punchbowl vicinity started a landslide at this point, killing five mortarmen of the 81-mm. Mortar Platoon, Co. D, 5th Infantry Regiment, U. S. Eighth Army, August 12, 1952.

U. S. Army photo

## VII. MANMADE DISASTERS

Man suffers injury to his person and damage to his property not only from natural disasters, but also as a result of manmade disaster. From a period of man-to-man combat, man's method of forcibly settling his difference with other men has evolved into a process whereby a few men with ultrapowerful weapons can wreak terrible havoc on millions of men, both combatant and noncombatant alike. The immense potency of the atomic and hydrogen bombs developed within the past decade has only served to emphasize this process of evolution. Unforgettable evidence of the gigantic destructive force of atomic bombs in their infant stage of development was indelibly etched on world memory by their use at Hiroshima and Nagasaki. Yet we are told on the authority of the Atomic Energy Commission that one A-bomb of the earliest type was equivalent to 20 kilotons (20,000 tons) of trinitrotoluene (TNT). As large as that sounds in comparison to TNT, the power of the early A-bomb is dwarfed by present hydrogen weapons. President Eisenhower and the AEC have publicly announced that we possess H-bombs in the range of megatons (millions of tons) of TNT. AEC also notes that blast effects can be approximately calculated by means of a scaling law, namely, the distance at which a given blast intensity is produced varies as the cube roots of the yields of the explosion. In an article written for the Britannica Book of the Year 1955, Chairman Lewis L. Strauss of the Atomic Energy Commission stated that fusion (thermonuclear) weapons such as H-bombs have about the same relation in magnitude to fission or A-bombs as the latter bear to conventional high explosive TNT bombs. News accounts of the March 1, 1954, thermonuclear explosion credited it with a force on the order of 16 megatons. This would be 800 times more powerful than the early A-bombs, and about 3 times as powerful as the H-bomb exploded at Eniwetok in the fall of 1952.

The November 1952 bomb explosion at ground level was stated to have the ability to cause complete annihilation within a 3-mile radius of the blast center, severe to moderate damage within 7 miles of the center, and light damage out to 10 miles from the center. This bomb made a crater 1 mile in diameter and 175 feet in depth at the target point. It was further stated that a midair explosion of this size bomb would have increased tremendously the areas of total destruction and severe damage.

Simple mathematical combination of the foregoing statistics would indicate a potential total destruction area of more than 9 miles from blast center for the March 1, 1954, H-bomb. The March 1954 explosion produced a cigar-shaped contaminated fallout area 220 miles downwind and up to 40 miles in width, and about 20 miles upwind and crosswind.

Other thermonuclear explosions were reported to have been set off by the United States on March 26, 1954, and in April 1954, at the Eniwetok testing grounds. By comparison, the A-bomb dropped on

Hiroshima on August 6, 1945, leveled all structures, except about three reinforced concrete structures, within a 1-mile radius from ground zero; and made empty shells of those few structures still standing. Of the 343,000 city inhabitants, the Japanese Government estimated the bomb killed 60,000, wounded 100,000, and made 200,000 more homeless.

The improved A-bomb dropped on Nagasaki on August 9, 1945, took less lives due to the smaller population of that city when compared with Hiroshima. The Japanese Government estimated 10,000 persons were killed, 20,000 were wounded, and 90,000 more made homeless.

It takes little imagination to conceive of the catastrophic damage that could be visited upon persons and property in the United States by the designed explosion of one or more thermonuclear bombs as an attack weapon.

Chairman Strauss has noted that 9 months after the November 1952 United States thermonuclear experiment the Soviet Union tested a thermonuclear explosive in August 1953.

The AEC notes four devastating effects from a nuclear explosion: (1) Blast, (2) heat, (3) immediate nuclear radiation, and (4) residual radioactivity. The first three are essentially instantaneous but the fourth has a more protracted effect. Because residual radioactivity produced by fallout took on added importance with the introduction of the thermonuclear device, Chairman Strauss, of the Atomic Energy Commission, and the AEC itself deemed it advisable to release a public statement and report in February 1955 discussing the effect of fallout as well as other damaging effects of the H-bomb exploded on March 1, 1954.

Since this statement and report outlines so clearly the potential damage contained in thermonuclear weapons, it is set forth in appendix A, page 194, in full.

The Strauss statement noted that possession of nuclear weapons by the U. S. S. R. made it advisable to inform Americans of the dangers of nuclear explosions and protective measures available. Fallout danger is greater when the fireball touches the earth's surface. He noted the cigar-shaped fallout area following the March 1, 1954, H-bomb explosion at Bikini, extending 220 miles downwind. For 140 of those miles, to a varying width up to 20 miles, all human life was threatened. At 160 miles downwind, only about half the persons would be in mortal peril. At the 190-mile point, only 5 or 10 percent of persons present would be in danger of loss of life. Hence, in 7,000 square miles of area, survival would depend upon prompt evacuation or protective measures.

The above estimates are the extreme, assuming no precautions would be taken and 36 hours of complete exposure. Nor would the fallout effects be uniform; they vary with atmospheric conditions.

Exposure to external radiation can be diminished as follows: 50 percent in first floor of frame house (more protection in brick or stone house); nine-tenths in average residential cellar; and to one five-thousand thsin cyclone cellar with 3-foot earth cover (completely safe).

Radioactive material may be visible dust or ash, but may be detected by Geiger counter even though invisible. Avoid food or liquids containing fallout particles. Prompt bathing and changing

clothes will reduce danger from fallout particles touching skin, hair, or clothing.

Two other forms of fallout hazard are internal radiation from swallowed particles and radiation effect upon germ cells transmitting inherited characteristics. Neither danger is serious from United States weapons tests to date. These tests have been monitored for radioactive forms of strontium and iodine. Potential genetic effects of radiation are debatable, but all nuclear detonations to date have exposed United States residents only to the same amount of radiation as exposure from a single chest X-ray. AEC medical and biological advisers believe this amount is no cause for serious concern.

Blast and heat effects of thermonuclear explosions are of the same nature as from atomic bombs, but the intensity and area increase with the explosion's yield of energy. Atomic bombs equivalent to 20,000 tons (kilotons) of TNT destroyed or severely damaged by blast or heat buildings in a 1-mile radius from ground zero. United States now has fission weapons many times more powerful and H-weapons ranging up to millions of tons (megatons) of TNT equivalent. Blast and heat effects are minimized by shelter. Even clothing helps prevent direct burns. Shelter may guard against flying or falling debris. Ordinary city buildings won't suffice as shelter near ground zero of large nuclear weapons; hence evacuation on early warning is desirable.

From the relatively small nuclear test explosions in Nevada, heavy fallout from ground bursts has carried only a few miles. No offsite community experienced at any time more radiation than one-third of that atomic-energy workers may safely receive annually under AEC standards.

Fallout in wartime remains a serious threat. Study and evaluation of weapons effects must continue until a workable international disarmament plan eliminates the possibility of atomic attack against the United States. Meanwhile United States self-defense means must improve.

Atomic Energy Commission report of February 1955 went into more detail than did Chairman Strauss' statement but covered the same outline. It was issued to condense and correlate information, some public and some previously classified for security reasons. Matters in the report not mentioned in Chairman Strauss' statement will be noted here.

Nuclear tests are evaluated for civil-defense planning as well as for military and technological purposes. Wartime uses of nuclear weapons may differ widely from test conditions, but certain fundamental observations are useful.

Noting the presence of blast, heat, and nuclear radiation from nuclear detonations and their increase in intensity with an increase of the detonation's magnitude, AEC states the 1954 thermonuclear-device tests showed the danger of residual radioactivity from fallout.

Blast, heat, and immediate nuclear radiation effects are relatively localized both as to personal injury and property damage, and may be reduced by shelter. Fallout threatens a larger area for a longer time; but the threat decreases with passage of time. The fallout pattern may change with different explosions. For 160 miles downwind in the March 1, 1954, test, early fallout looked like snow and began 8 hours after the detonation, continuing for several hours.

Radiation dosage is measured in roentgens. Twenty-five roentgens over a brief time period cause temporary changes in human blood: 100 roentgens in a short period may produce nausea and other radiation-sickness symptoms; 450 roentgens in a day would be fatal to half those exposed. Spread over a longer period, a given dosage is less damaging.

Ten miles downwind from the 1954 explosion, dosage was about 5,000 roentgens for the first 36 hours. One hundred miles away from ground zero, dosage was 2,300 roentgens as a maximum. At 125 miles on Rongelap Atoll 1,000 roentgens were measured. Farther south only 150 roentgens showed up at 115 miles.

The AEC at this point repeated the mortality rate chart outlined in the Strauss statement, together with the relative value of protective measures. It also noted the harmless doses of radiation resulting from the Nevada tests.

Noting our constant exposure to radiation from natural sources, AEC warned that the most widespread radiation is caused by longer-lived fission products, which may be distributed over the whole earth. But the amount of fallout decreases with distance from the blast.

Fallout contains strontium 90 with a 30-year average life. This tends to collect in human bone. Inhalation is possible but normally not so dangerous as swallowing. The material may fall on plants or be taken up by them from the soil. Studies of radiostrontium in the soil from all nuclear explosions are reassuring to date.

Radioiodine 131 with an average life of only  $11\frac{1}{2}$  days results from fallout too. Its tendency to gather in the thyroid gland threatens damage to thyroid cells. The spring 1954 test series developed only a few percent of the annual dose of radioiodine that can be absorbed harmlessly.

Total amounts of radiostrontium and radioiodine outside test sites presently offer no serious hazard to health, in the opinion of AEC.

Rather a wide range of admissible opinion exists on the possible genetic effects of nuclear detonations upon the germ cells transmitting inherited characteristics to new generations. Exposure of United States residents from all nuclear detonations to February 1955 was about one-tenth of a roentgen (about one one-hundredth of average radiation exposure from natural causes during a person's reproductive lifetime). This equals the radiation caused during one chest X-ray. AEC medical and biological advisers believe the small additional radiation exposure caused by the United States weapons testing program will have no serious genetic effects; but are continuing a thorough study. Such risk as exists in weapons testing must be balanced against the value such testing has for United States and free-world security. No residual radioactivity has concentrated in dangerous amounts outside test areas to the date of this report (February 1955).

Ten years after it had the dubious distinction of being the first city damaged by an A-bomb, Hiroshima has been rebuilt. Phoenix-like it rose from its ruins to become a better planned city with wider streets, commercial buildings of modern design, and many masonry-walled homes to replace flimsy-wood residential construction. Hous-

ing was planned in a more orderly fashion than in the old city. Land uses have changed, a commercial area giving way to a playground and industries occupying former residential areas. With population again at prewar level and no adverse genetic effects observable in the first new generation, Hiroshima's industry is reputed to be thriving. A study of the means of financing used to accomplish this rebuilding should prove of interest. Greater potential destruction if unleashed would call forth corresponding but greater efforts to rebuild an area. The task would seem appalling in the light of destruction wrought by the November 1952 H-bomb and the greater potential destruction now capable of being wrought by thermonuclear weapons.

With an increase in destructive potential of nuclear weapons has come an increase in knowledge of means of controlling them. This pinpointing of their effect could mean less general destruction in the area surrounding the target area. However, unfortunately we have no reason to assume that any future enemy will confine his efforts to pinpoint attacks on direct military targets only, even though it would be scientifically possible for him to do so. Factors leading toward such a limitation, such as desire to incur no more expense than deemed necessary to accomplish the mission at hand and a desire to spare noncombatants from harm, have not proved sufficiently controlling in earlier periods of combat to enable this Nation to rely on any influence of such factors on a possible future enemy. Militarily this Nation must continue to prepare to meet the worst while praying for the best.

The magnitude of actual injury and damage caused in this country in any future war will depend more on the enemy's capabilities than on this Nation's hopes. In these days of economic and psychological warfare, it must be assumed that any enemy would attempt to strike a knockout blow to this country's economic potential and inculcate fear and panic among the populace in an effort to destroy their will to resist, as well as attempting to cripple our military might—all with a view toward preventing or minimizing to as great an extent as possible our own ability to meet attack with swift retaliation. With the seemingly never-ending race for supremacy between means of offense and defense, it is difficult to predict which will hold the upper hand at any given future date. However, on the basis of information now available, it appears we cannot presently assume immunity from attack even with the best defensive mechanisms at our command.

Therefore, any Federal program for indemnification of war damage should take cognizance of the maximum damage we must expect rather than the minimum damage we would hope for, in the event of future hostilities.

Consistent with security safeguards, the advisability and feasibility of a Federal war damage indemnity program can best be judged against a background of accurate information concerning the destructive capacity of modern weapons and those in the foreseeable future, the expected manner of use of such weapons by a potential enemy, and our capabilities of defending against the evil effects resulting from their successful use by the enemy.

Hoping for no such attack, we nevertheless must consider its possibility and probable results in planning any war damage indemnity program. To rely on an assumption that no such attack will ever

come would make needless the consideration of any war damage indemnity legislation.

The remaining problems calling for attention in devising such an indemnity or insurance program differ, if at all, in nothing but degree from those discussed comprehensively during the public hearings held by this committee's Subcommittee on Securities, Insurance, and Banking on war damage legislation under the chairmanship of Senator Frear on April 18, 19, 24, 25, and July 11, 1951. Reference is made to the printed record of those hearings for more detailed information concerning such problems.

## APPENDIX A

### THE EFFECTS OF HIGH-YIELD NUCLEAR EXPLOSIONS

Statement by Lewis L. Strauss, Chairman, United States Atomic Energy Commission

At a news conference on December 17, 1954, I stated that the staff of the Atomic Energy Commission was studying the subject of fallout and expressed the hope that information about it would be made public at a later date. "Fallout" is the word now applied to a phenomenon that follows the explosion of a nuclear weapon. Such an explosion, if the fireball touches the surface of the earth, draws up large amounts of materials into the bomb cloud. These materials subsequently fall back to earth as radioactive particles over a large area, mostly downwind and relatively close to the point of explosion—although the lighter particles are carried great distances. The main radioactivity of fallout decreases very rapidly with time—for the most part, within the first hours after the explosion. An in-the-air explosion where the fireball does not touch the earth's surface does not produce any serious radiological fallout hazard.

Since nuclear weapons are in possession of the U. S. S. R., the Commission believes the American people wish to be informed regarding the dangers of nuclear explosions and the measures which individuals can take to protect themselves if an atomic attack should ever occur. Therefore, the Commission has condensed in the attached report the information which can be made public at this time on the effects of the explosions of high-yield nuclear weapons.

The following excerpts and summarized sections contain the highlights of the report itself.

#### FALLOUT PATTERN OF 1954 TEST IN THE PACIFIC

The very large thermonuclear device tested at Bikini Atoll on March 1, 1954, was detonated on a coral island and the ensuing fallout contaminated an elongated, cigar-shaped area extending approximately 220 statute miles downwind and varying in width up to 40 miles. In addition, there was a contaminated area upwind and crosswind extending possibly 20 miles from the point of detonation. Data was collected from 25 points on 5 atolls located from 10 to 330 miles downwind (generally east) from Bikini Atoll. Due to an unexpected shift in the direction of the prevailing winds in the higher altitudes, the fallout missed the observation rafts that had been placed farther north previous to the test firing. The estimated contour of the pattern of fallout is, therefore, based only in part on data obtained from actual measurements and partly on calculations.

Data from this and other tests permits estimates of casualties which would have been suffered within this contaminated area if it had been populated. These estimates assume (1) that the people in the area would ignore even the most elementary precautions; (2) that they would not take shelter but would remain out of doors completely exposed for about 36 hours; and (3) that in consequence they would receive the maximum exposure. Therefore, it will be recognized that the estimates which follow are what might be termed extreme estimates since they assume the worst possible conditions.

On the basis of our data from this test and other information, it is estimated that, following the March 1, 1954, test explosion, there was sufficient radioactivity in a downwind belt about 140 miles in length and of varying width up to 20 miles to have seriously threatened the lives of nearly all persons in the area who took no protective measures.

Some distance farther from the point of detonation, at about 160 miles downwind and along the axis of the ellipse, the amount of radioactivity would have seriously threatened the lives of about one-half of the persons in the area who took no protective measures.

Near the outer edge of the ellipse, or approximately 190 miles downwind, it is estimated that the level of radioactivity would have been sufficient to have seriously threatened the lives of 5 to 10 percent of any persons who might have remained exposed out of doors for all of the first 36 hours.

Thus, about 7,000 square miles of territory downwind from the point of burst was so contaminated that survival might have depended upon prompt evacuation of the area or upon taking shelter and other protective measures.

At a distance of 220 miles or more downwind, it is unlikely that any deaths would have occurred from radioactivity even if persons there had remained exposed up to 48 hours and had taken no safety measures.

The estimates cited above do not apply uniformly throughout the contaminated area inasmuch as the intensity of radioactivity within a region of heavy fallout will vary from point to point, due to such factors as air currents, rain, snow, and other atmospheric conditions. Because of this and because most persons, if given sufficient warning, probably would evacuate the area or take shelter and other precautionary measures, the actual percentage of fatalities could reasonably be presumed to be considerably smaller than these extreme estimates.

#### PROTECTION AGAINST FALLOUT

In an area of heavy fallout the greatest radiological hazard is that of exposure to external radiation, which can be greatly reduced by simple precautionary measures. Exposure can be reduced by taking shelter and by simple decontamination measures. Test data indicates that the radiation level, i. e., the rate of exposure, indoors on the first floor of an ordinary frame house in a fallout area would be about one-half the level out of doors. Even greater protection would be afforded by a brick or stone house. Taking shelter in the basement of an average residence would reduce the radiation level to about one-tenth that experienced out of doors. Shelter in an old-fashioned cyclone cellar, with a covering of earth 3 feet thick, would reduce the radiation level to about one five-thousandths, or down to a level completely safe, in even the most heavily contaminated area. Designs of shelters of simple yet effective construction have been prepared by the Civil Defense Administration and are available to the public.

Radioactive material deposited during the fallout may or may not be visible but would be revealed by radiation detection instruments such as Geiger counters. Any falling dust or ash that can be seen downwind within a few hours after a nuclear explosion should be regarded as radioactive until measured by a radiation detection instrument.

Care should be taken to avoid the use of solid foods or liquids that may contain fallout particles.

If fallout particles come into contact with the skin, hair, or clothing, prompt decontamination precautions such as have been outlined by the Federal Civil Defense Administration will greatly reduce the danger. These include such simple measures as thorough bathing of exposed parts of the body and a change of clothing.

#### INTERNAL RADIATION EFFECTS

Two other factors must be considered in evaluating possible hazards from radioactive fallout. The first is the effect of internal radiation from fallout particles swallowed in food or liquids. The second is the effect of radiation upon the germ cells which transmit inherited characteristics from one generation to another. It should be noted that in neither case is there reason to believe that weapons-testing programs of the United States have resulted in any serious public hazard.

The radioactive forms of strontium and iodine are the constituents of fallout which are of principal concern as internal sources of radiation through ingestion. The concentrations of these substances from nuclear detonations to date have been monitored at many localities, and the amounts detected have been insignificant, compared to concentrations which would be hazardous.

#### GENETIC EFFECTS OF RADIATION

There is a wide range of admissible opinion as to the genetic effects which radiation might have upon future generations, and conclusive data are not available at present on which to base an incontrovertible forecast. However, it is important

to recognize that the average amount of radiation exposure received by residents of the United States from all nuclear detonations to date has been about the same as the exposure received from one chest X-ray. The Commission's medical and biological advisers do not believe that this small amount of additional exposure is any basis for serious concern at this time.

#### BLAST AND HEAT EFFECTS

Two important characteristics of any nuclear explosion, other than those from fallout, are the effects of blast and heat, which are of the same nature for a thermonuclear bomb as for the earlier and smaller atomic bombs. The intensity and area of the blast and heat effects increase in relation to the greater energy yield of the explosion. Much information on these two effects has already been published by the Atomic Energy Commission, but it might be recalled that an atomic bomb of the earliest type, equivalent to 20,000 tons of TNT, would produce blast and heat sufficient to destroy, or damage severely, buildings within a radius of more than 1 mile from the explosion point. The United States has developed fission bombs many times as powerful as the first atomic bombs, and hydrogen weapons in the ranges of millions of tons (megatons) of TNT equivalent.

#### PROTECTION AGAINST BLAST AND HEAT

The hazard from both burn and blast effects well outside the central target area would be reduced greatly by shelter. Clothing or almost any kind of shelter would reduce the danger of direct burns, although there might be danger of clothing and structures becoming ignited. Also, shelter would materially reduce the hazard of blast injury by affording protection against flying or falling debris. As is generally known, the shelter afforded by ordinary city buildings would not suffice within the central area surrounding the point of explosion of a large nuclear weapon. For this reason, the Federal Civil Defense Administration recommends evacuation of the central areas of target zones on early warning of approaching attack.

#### FALLOUT FROM NEVADA TESTS

Only relatively small nuclear test explosions are conducted at the Nevada test site, in contrast to the tests of high-yield thermonuclear devices at the Pacific Proving Grounds. In Nevada, as well as in the Pacific, all tests are planned for times when forecast weather conditions minimize the possibility of fallout hazard. High air bursts at the Nevada test site have produced no significant fallout; heavy fallout from near-surface explosions has extended only a few miles from the point of burst. The hazard has been successfully confined to the controlled area of the test site. The highest actual dose of radiation at an offsite community has been estimated to be less than one-third of the greatest amount of radiation which atomic-energy workers are permitted to receive each year under the Atomic Energy Commission's conservative safety standards.

#### CONCLUSION

In the event of war involving the use of atomic weapons, the fallout from large nuclear bombs exploded on or near the surface of the earth would create serious hazard to civilian populations in large areas outside the target zones. The Atomic Energy Commission hopes that these dangers will never be experienced by mankind. However, until the possibility of an atomic attack against us is eliminated by a workable international plan for general disarmament, the study and evaluation of the effects of weapons which might be used against us and the improvement of our means of self-defense are a paramount duty of our Government.

#### A REPORT BY THE UNITED STATES ATOMIC ENERGY COMMISSION ON THE EFFECTS OF HIGH-YIELD NUCLEAR EXPLOSIONS

1. Considerable information on the effects of the explosions of atomic weapons has been made public by the Government since the first nuclear detonations in 1945. The handbook, *The Effects of Atomic Weapons*, published in 1950, is being revised and brought up to date to include the effects of thermonuclear weapons, as a result of the most recent tests at the Pacific Proving Grounds. References to the effects of thermonuclear explosions have been made in several official statements, beginning with Chairman Strauss' description of the phenomenon of fallout at a White House news conference on March 31, 1954. The

following statement is designed to condense and correlate information, some of which already has been made public and other portions of which have been of a classified nature until now.

2. The effects of nuclear tests are evaluated for civil-defense planning as well as for military and technological purposes. So long as nuclear weapons are in possession of any unfriendly power, the Commission believes the American public will wish to be as fully informed as possible as to the nature and extent of the dangers of nuclear attack and of the protective measures that can be taken by individuals and communities to avoid or minimize those dangers if we should be attacked.

3. Test conditions, which must necessarily form the principal basis of evaluating the effects of nuclear explosions, may differ markedly from those which might be expected if nuclear weapons were used against our population in wartime. It would be difficult to predict the size or kind of bomb an enemy might use against us in event of war, the exact means of its delivery, the height at which it would be exploded, or the number of bombs which might reach a given target. Nevertheless, the facts to follow are the fundamental ones at this time.

#### FOUR EFFECTS OF DETONATIONS

4. A nuclear detonation produces four major characteristics: blast, heat, immediate nuclear radiation, and residual radioactivity. Of these, the first three are essentially instantaneous, while the fourth has a more protracted effect. The phenomena of blast, heat, and nuclear radiation from the detonation of a thermonuclear bomb are of the same nature as those of earlier and smaller atomic bombs. The nature of the phenomena is, in general terms, standardized whether the bomb be a 20,000-ton (TNT equivalent) atomic weapon or a thermonuclear one of many times that power. The intensity and area of the blast, heat, and nuclear radiation increase in relation to the greater energy yield of the explosion. Information on these effects has been extensively publicized; therefore, the remainder of this report deals principally with effects other than heat and blast.

5. Residual radioactivity, although in no sense exclusive to high yield thermonuclear detonations, does become a matter of major concern when a large thermonuclear device of the type used in the 1954 tests in the Pacific is exploded. The fallout of radioactivity from such an explosion, may, under certain conditions, settle over wide areas. Therefore, the extent and severity of this radioactive fallout has been a subject of continuing study since the first full-scale thermonuclear tests at the Pacific Proving Grounds on November 1, 1952. The results of these studies and of our evaluation of data obtained from the latest tests in the Pacific in March 1954, are described in subsequent parts of this report.

6. It should be noted that if we had not conducted the full-scale thermonuclear tests mentioned above, we would have been in ignorance of the extent of the effects of radioactive fallout and, therefore, we would have been much more vulnerable to the dangers from fallout in the event an enemy should resort to radiological warfare against us.

#### BLAST AND HEAT EFFECTS

7. The effects of blast and heat from a nuclear explosion are relatively localized. One A-bomb of the earliest type equivalent to 20,000 tons of TNT (20 kilotons) would produce blast sufficient to destroy or damage severely residences within a radius of more than 1 mile from the point of burst. Within a radius of about a mile and a half, residences would be so damaged as to be unusable without repairs. A principal hazard to human beings would come from flying and falling debris and from fires due to such causes as broken gas and electric lines or overturned stoves. The area in which injuries to human beings would be caused by blast, therefore, would be about the same as the area of damage to structures.

8. The United States, as announced previously, has developed fission bombs many times as powerful as the first A-bombs, and hydrogen weapons in the ranges of millions of tons (megatons) of TNT equivalent. For these larger weapons, the blast effects can be calculated approximately by means of a scaling law, namely, the distance at which a given blast intensity is produced varies as the cube roots of the yields of the explosions.

9. Similarly, the heat and burn effects of nuclear explosions can be estimated from accumulated data. These effects, of course, are influenced by prevailing atmospheric conditions. The time element also is a prime factor. Very large weapons deliver heat over an appreciably greater period of time than smaller weapons. A given quantity of heat from a high-yield weapon, delivered over a

longer period of time, will produce somewhat less severe burns than the same quantity of heat from a nominal detonation.

#### PROTECTION AGAINST BLAST AND HEAT

10. The hazard from both burn and blast effects in the outer affected areas would be reduced greatly by shelter. Clothing or almost any kind of shelter would reduce the danger of direct burn, although there might be some danger of clothing and structures becoming ignited. Also, shelter would materially reduce the hazard of blast injury by affording protection against flying or falling debris. The Federal Civil Defense Administration has made extensive studies of shelters and has issued plans for several simple and inexpensive types which can be utilized by householders. As is generally known, the shelter afforded by ordinary city buildings would not suffice within the central area surrounding the point of burst of a large nuclear weapon. For this reason, the Federal Civil Defense Administration recommends evacuation of the central areas of target zones on early warning of approaching attack.

#### RADIATION EFFECTS

11. The immediate nuclear radiation, i. e., the neutrons and gamma rays released instantaneously with the explosion of a large weapon on or near the ground, does not present a serious hazard beyond the area where heat and blast are of great concern.

#### FALLOUT RADIATION

12. However, particles with residual radioactivity produced by a detonation (as opposed to the immediate nuclear radiation) may fall out over an area much larger than that affected by blast and heat, and over a longer period of time. All nuclear detonations produce radioactive materials, but the nature and extent of the radioactive fallout depends on the conditions under which the bomb is fired. The main radioactivity of a bomb's fallout decreases very rapidly with time—for the most part, within the first hours after the detonation.

#### FALLOUT FROM IN-THE-AIR DETONATIONS

13. In an in-the-air explosion where the fireball does not touch the earth's surface, the radioactivity produced in the bomb condenses only on solid particles from the bomb casing itself and the dust which happens to be in the air. In the absence of material drawn up from the surface, these substances will condense with the vapors from the bomb and air dust to form only the smallest particles. These minute substances may settle to the surface over a very wide area—probably spreading around the world—over a period of days, or even months. But they descend extremely slowly with the result that, by the time they have reached the earth's surface, the major part of their radioactivity has been dissipated harmlessly in the atmosphere, and the residual contamination is widely dispersed.

#### FALLOUT FROM SURFACE DETONATIONS

14. If, however, the weapon is detonated on the surface or close enough so that the fireball touches the surface, then large amounts of material will be drawn up into the bomb cloud. Many of the particles thus formed are heavy enough to descend rapidly while still intensely radioactive. The result is a comparatively localized area of extreme radioactive contamination and a much larger area of some hazard. Instead of wafting down slowly over a vast area, the larger and heavier particles fall rapidly before there has been an opportunity for them to decay harmlessly in the atmosphere and before the winds have had an opportunity to scatter them.

15. The area of hazard from radioactive fallout from a surface or near-surface explosion of a thermonuclear weapon is much larger than the areas seriously affected by heat and blast. The large radioactive cloud of a thermonuclear explosion rises with great rapidity to the highest levels of the atmosphere and spreads over hundreds of square miles in the first hours. During this time the winds toss the extremely radioactive particles about and the pattern of the radioactive fallout is determined by the size of the particles and by the direction and velocities of the winds, including those up to 80,000 feet and above. The nature of the surface of the earth on which the bomb is fired also must be taken into consideration. Because of these variables, it is impossible to apply a single fallout pattern to all thermonuclear detonations, even test explosions conducted

under selected conditions. However, with adequate knowledge of atmospheric conditions, including wind directions and velocities up to high levels and meteorological reports, the fallout region for any detonation usually can be predicted with considerable accuracy. In general terms, the region of severe fallout contamination from the detonation of a thermonuclear weapon fired on or near the surface can be described as an elongated, cigar-shaped area extending downwind from the point of burst.

#### FALLOUT PATTERN OF 1954 TEST IN THE PACIFIC

16. The very large thermonuclear device fired at the Bikini Atoll on March 1, 1954, was exploded on a coral island. Coral consists of calcium carbonate; thus the detonation's radioactivity was spread by particles consisting largely of unslaked lime which, during the hours of descent, was slaked by moisture in the atmosphere. These particles ranged between one-thousandth and one-fiftieth of an inch in diameter and were, on the average, somewhat adhesive. The prevailing winds were westerly so the bomb cloud moved generally to the east and deposited the radioactive particles in varying amounts over an elliptical or cigar-shaped area. About 160 (statute) miles downwind from the point of burst the early fallout was observed in the form of fine particles which looked like snow. Fallout began there about 8 hours after the detonation and continued for several hours.

17. The roentgen is the commonly accepted unit of measurement of radiation dosage. A dose of about 25 roentgens of radioactivity received by a person over a brief space of time will produce temporary changes in the blood. A dose of some 100 roentgens received in a short interval may produce nausea and other symptoms of radiation sickness. About 450 roentgens delivered over a day or so might be fatal to approximately half of the persons so exposed. However, because of the body's repair processes, a total radiation dose which would be serious if incurred in a few minutes would produce much less effect if spread over a period of years. These statements may be helpful in understanding the data which follow.

18. The test explosion, at ground surface, contaminated a cigar-shaped area extending approximately 220 statute miles downwind and varying in width up to 40 miles. In addition, there was a contaminated area upwind and crosswind extending possibly 20 miles from the point of detonation. Data was collected from 25 points on 5 atolls located from 10 to 330 miles downwind (generally east) from Bikini Atoll. Due to an unexpected shift in the direction of the prevailing winds in the higher altitudes, the fallout missed the observation rafts that had been placed farther north previous to the test firing. The estimated contour of the pattern of fallout is, therefore, based only in part on data obtained from actual measurements and partly on extrapolation, i. e., calculations based on known data, including factual information obtained during previous tests of smaller devices.

19. Data from this test permits estimates of casualties which would have been suffered within this contaminated area if it had been populated. These estimates assume: (1) That the people in the area would ignore even the most elementary precautions; (2) that they would not take shelter but would remain out of doors completely exposed for about 36 hours; and (3) that in consequence they would receive the maximum exposure. Therefore, it will be recognized that the estimates which follow are what might be termed extreme estimates since they assume the worst possible conditions.

20. On the basis of our data from this and other tests, it is estimated that, following the test explosion on March 1, 1954, there was sufficient radioactivity in a downwind belt about 140 miles in length and of varying width up to 20 miles to have seriously threatened the lives of nearly all persons in the area who did not take protective measures. During the actual tests, of course, there were no people in this zone. Inside Bikini Atoll at a point 10 miles downwind from the explosion it is estimated that the radiation dosage was about 5,000 roentgens for the first 36-hour period after the fallout. The highest radiation measurement outside of Bikini Atoll indicated a dosage of 2,300 roentgens for the same period. This was in the northwestern part of the Rongelap Atoll, about 100 miles from the point of detonation. Additional measurements in Rongelap Atoll indicated dosages, for the first 36-hour period, of 2,000 roentgens at 110 miles, 1,000 roentgens at 125 miles, and, farther south, only 150 roentgens at 115 miles from Bikini.

21. Some distance farther from the point of detonation, at about 160 miles downwind and along the axis of the ellipse, the amount of radioactivity would

have seriously threatened the lives of about one-half of the persons in the area who failed to take protective measures. It is estimated that the radiation dosage at that point was about 500 roentgens for the first 36-hour period.

22. Near the outer edge of the cigar-shaped area, or approximately 190 miles downwind, it is estimated that the level of radioactivity would have been sufficient to have seriously threatened the lives of 5 to 10 percent of any persons who might have remained exposed out of doors for the first 36 hours. In this area the radiation dosage is estimated at about 300 roentgens for the first 36-hour period.

23. Thus, about 7,000 square miles of territory downwind from the point of burst was so contaminated that survival might have depended upon prompt evacuation of the area or upon taking shelter and other protective measures.

24. At a distance of 220 miles or more downwind, it is unlikely that any deaths would have occurred from radioactivity even if persons there had remained exposed up to 48 hours and had taken no safety measures.

25. The estimates cited above do not apply uniformly throughout the contaminated area inasmuch as the intensity of radioactivity within a region of heavy fallout will vary from point to point due to such factors as air currents, rain, snow, and other atmospheric conditions. Because of this and because most persons, if given sufficient warning, probably would evacuate the area or take shelter and other precautionary measures, the actual percentage of deaths could reasonably be presumed to be considerably smaller than these extreme estimates.

#### PROTECTION AGAINST FALLOUT

26. In an area of heavy fallout the greatest radiological hazard is that of exposure to external radiation. Simple precautionary measures can greatly reduce the hazard to life. Exposure can be reduced by taking shelter and by utilizing simple decontamination measures until such times as persons can leave the area. Test data indicate that the radiation level, i. e., the rate of exposure, indoors on the first floor of an ordinary frame house in a fallout area would be about one-half the level out of doors. Even greater protection would be afforded by a brick or stone house. Taking shelter in the basement of an average residence would reduce the radiation level to about one-tenth that experienced out of doors. Shelter in an old-fashioned cyclone cellar, with a covering of earth 3 feet thick, would reduce the radiation level to about one five-thousandths, or down to a level completely safe, in even the most heavily contaminated area. Designs of shelters of simple yet effective construction have been prepared by the Civil Defense Administration and are available to the public.

27. Radioactive material deposited during fallout may or may not be visible but would be revealed by radiation detection instruments such as Geiger counters. Any falling dust or ash that can be seen downwind within a few hours after a nuclear explosion should be regarded as radioactive until measured by a radiation detection instrument and found to be harmless.

28. Care should be taken to avoid the use of solid foods or liquids that may contain fallout particles.

29. If fallout particles come into contact with the skin, hair, or clothing, prompt decontamination precautions such as have been outlined by the Federal Civil Defense Administration will greatly reduce the danger. These include such simple measures as thorough bathing of exposed parts of the body and a change of clothing.

30. If persons in a heavy fallout area heeded warning or notification of an attack and evacuated the area or availed themselves of adequate protective measures the percentage of fatalities would be greatly reduced even in the zone of heaviest fallout.

#### FALLOUT FROM NEVADA TESTS

31. Only relatively small nuclear test explosions are conducted at the Nevada test site, in contrast to the tests of high-yield thermonuclear devices at the Pacific proving grounds. In Nevada, as well as in the Pacific, all tests are planned for times when forecast weather conditions minimize the possibility of fallout hazard. Methods of forecasting weather patterns in these areas are improving steadily. High air bursts at the Nevada test site have produced no significant fallout; heavy fallout from near-surface explosions has extended only a few miles from the point of burst. The hazard has been successfully confined to the controlled area of the test site. The highest actual dose of radiation at an offsite community has been estimated to be less than one-third of the greatest amount of radiation which atomic energy workers are permitted to receive each year under the Atomic Energy Commission's conservative safety standards.

## INTERNAL RADIATION EFFECTS

32. Several basic facts should be kept in mind in evaluating the hazard from fallout radiation. First, radiation is not a new phenomenon created by the explosions of fission and thermonuclear weapons. Since the beginning of life, living things have been exposed constantly to radiation from natural sources. Cosmic rays from space constantly pass through our bodies. We are exposed to background radiation from radium and radon in the soil, water, and air. Our bodies have always contained naturally radioactive potassium and carbon.

33. As pointed out earlier, detonations of all atomic weapons produce radioactivity, a portion of which is carried to high altitudes and over great distances in the form of fine particles. The percentage of this radioactivity which travels beyond the relatively near area of the explosion depends largely on the conditions under which the bomb is fired, the percentage being higher for in-the-air bursts where the fireball does not touch the earth's surface. The most widespread radioactivity is produced only by the longer lived fission products, since the radioactivity of the shorter lived products decays and disappears before the particles come down to earth in a matter of days, weeks, months, and even years. The longer lived radioactive products may be distributed over the entire earth. However, as the particles are carried farther and farther to remote areas, the possibility of significant amounts of fallout decreases.

## RADIOSTRONTIUM FALLOUT

34. One of the most biologically important radioactive substances found in fallout is strontium 90. It has a long lifetime—nearly 30 years on the average. Radiostrontium has a chemical similarity to calcium and, therefore, when taken into the body it has a tendency to collect in the bones. Radiostrontium can enter the body in two ways—by inhaling or by swallowing. Normally, the amount inhaled would be small compared with the amount one might swallow. Fallout material deposited directly on edible parts of plants may be eaten along with the plants, but washing the plants before they are eaten would remove most of this radioactive material. However, rainfall carrying the radiostrontium down to earth may deposit it in the soil where it can be taken up, in part, by plants and incorporated into plant tissues, later to be eaten by humans or by grazing animals which, in turn, provide food for humans.

35. Since the start of nuclear tests, careful measurements have been made of the distribution of radiostrontium over the earth's surface, in the soils, in plants and animal tissues, in the oceans, in rain, in the atmosphere, and in all forms in which it might be expected to occur. The results of this study are reassuring. The amount of radiostrontium now present in the soil as a result of all nuclear explosions to date would have to be increased many thousand times before any effect on humans would be noticeable.

## RADIOIODINE FALLOUT

36. Among the shorter lived fission products involved in the study of internal radiation, the most biologically important is radioiodine 131, with an average life of only 11.5 days. Even though this product may be widely spread after a nuclear explosion, the possibility of serious hazard is limited by its relatively short life. Like the nonradioactive form of the element, it concentrates in the thyroid gland and, in excessive quantity, conceivably could damage the thyroid cells.

37. Scientists of the Atomic Energy Commission have estimated that the average exposure of people in the United States from radioiodine in the fallout from the entire series of tests in the spring of 1954 was only a few percent of the annual dose that can be received year after year and still have no noticeable effects.

38. These two isotopes—radiostrontium and radioiodine—constitute the principal internal hazards from the radioactivities produced by the detonations of atomic weapons both fission and thermonuclear. The Atomic Energy Commission has been engaged for 3 years in a broad study of the radioactive forms of these isotopes and conducts year-round monitoring of these radioactivities in many locations. Any accumulation of these materials can be detected with great sensitivity so that ample warning of potential hazard could be given long before any actual danger occurred from test detonations. The amounts of radiostrontium and radioiodine which have fallen outside the areas near the test sites as a result of all atomic tests up to now are insignificant compared to concentrations that would be considered hazardous to health.

## GENETIC EFFECTS OF RADIATION

39. One other effect of radiation must be considered in evaluating the long-range possibilities of hazard from nuclear detonations. This is the possible genetic effect upon the germ cells which transmit inherited characteristics from one generation to another. At our present stage of genetic knowledge, there is a rather wide range of admissible opinion on this subject.

40. In general, the total amount of radiation received by residents of the United States from all nuclear detonations to date, including the Russian and British tests and all of our own tests in the United States and the Pacific, has been about one-tenth of 1 roentgen. This is only about 1/100th of the average radiation exposure inevitably received from natural causes by a person during his or her reproductive lifetime. It is about the same as the exposure received from one chest X-ray.

41. The medical and biological advisers of the Atomic Energy Commission believe that the small amount of additional exposure of the general population of the United States from our nuclear weapons testing program will not seriously affect the genetic constitution of human beings. Nevertheless, we are continuing our thorough study of the entire question and will continue to report our findings to the American people.

## SUMMARY

42. The Atomic Energy Commission hopes that the information on nuclear weapons' effects contained in the foregoing report will never be reflected in human experience, as the result of war. However, until the possibility of an atomic attack is eliminated by a workable international plan for general disarmament, the study and evaluation of weapons' effects and civil defense protection measures must be a necessary duty of our Government.

43. Inevitably, a certain element of risk is involved in the testing of nuclear weapons, just as there is some risk in manufacturing conventional explosives or in transporting inflammable substances such as oil or gasoline on our streets and highways. The degree of risk must be balanced against the great importance of the test programs to the security of the Nation and of the free world. However, the degree of hazard can be evaluated with considerable accuracy and test conditions can be controlled to hold it to a minimum. None of the extensive data collected from all tests shows that residual radioactivity is being concentrated in dangerous amounts anywhere in the world outside the testing areas.

44. In the event of war involving the use of atomic weapons, the fallout from large nuclear bombs exploded on or near the surface would create serious hazards to civilian populations in large areas outside the target zones. However, as mentioned in the foregoing report, there are many simple and highly effective precautionary measures which must be taken by individuals to reduce casualties to a minimum outside the immediate area of complete or near-complete destruction by blast and heat. Many of these protective measures, such as shelter and decontamination procedures, have been detailed by the Federal Civil Defense Administration.

## VIII. NATURAL DISASTER RELIEF

### FEDERAL ASSISTANCE UNDER PUBLIC LAW 875

Public Law 875, 81st Congress, approved September 30, 1950, see appendix A, page 226, to this chapter, was enacted by Congress to provide—

an orderly and continuous means of assistance by the Federal Government to the States and local governments in carrying out their responsibilities to alleviate suffering and damage resulting from major disasters \* \* \*.

This law, as amended, is the primary source of authority for relief by the Federal Government in the event of a major natural disaster.

The President is authorized by the law to make the determination that any flood, drought, fire, hurricane, earthquake, storm or other catastrophe is of sufficient severity to be classified a "major disaster." Before this determination can be made, the Governor of the State in which such catastrophe occurs must formally request that the provisions of the law be invoked. The Governor must certify the need for Federal assistance and must give assurance of the expenditure of a reasonable amount of funds by the State or local governments for relief purposes.

After the declaration of a major disaster, all Federal agencies are authorized when directed by the President to provide assistance by—

- (1) utilizing or lending to States and local governments their equipment, supplies, facilities, personnel, and other resources;
- (2) distributing, through the American Red Cross or otherwise, medicine, food, and other consumable supplies;
- (3) donating or lending to the States surplus equipment and supplies;
- (4) performing work for preservation of life and property;
- (5) making emergency repairs to and temporary replacement of local public facilities;
- (6) clearing debris and wreckage;
- (7) providing temporary housing or emergency shelters; and
- (8) making contributions to State and local governments.

In order to insure maximum mobilization of Federal assistance, the President is authorized to coordinate the activities of all Federal agencies and to direct them to utilize all their available resources. The act does not authorize permanent restoration and rehabilitation work for the aid of States and local governments, but is limited to temporary or emergency types of assistance (see H. Rept. No. 2727, 81st Cong.). However, it does provide authority for the permanent restoration of Federal facilities which are damaged or destroyed.

Exercising his discretion under the law, the President has delegated the administration of the act to the Federal Civil Defense Administrator by Executive Order 10427, issued January 16, 1953. This Executive order revoked Executive Order 10221 of March 2, 1951, which had designated the Administrator of the Housing and Home Finance Agency to administer the provisions of Public Law 875.

The Federal Civil Defense Administrator is empowered by the Executive order to—

1. Direct Federal agencies in providing assistance in major disasters.
2. Coordinate the activities of the Federal agencies and to direct the utilization of their available personnel, equipment, supplies, facilities, and other resources.
3. Prepare rules and regulations for the consideration of the President to carry out the provisions of the law.
4. Coordinate the making of plans and preparations by the Federal agencies in anticipation of their responsibilities in the event of a major disaster.
5. Foster the development of such State and local organizations and plans as may be necessary to cope with major disasters.
6. Coordinate the disaster relief assistance afforded by Federal agencies under their own statutory authority.

The Executive order also makes clear the philosophy to be applied in granting disaster relief by stating:

Federal disaster relief provided under the act shall be deemed to be supplementary to relief afforded by State, local, or private agencies and not in substitution therefor; Federal financial contributions for disaster relief shall be conditioned upon reasonable State and local expenditures for such relief; the limited responsibilities of the Federal Government for disaster relief shall be made clear to State and local agencies concerned; and the States shall be encouraged to provide funds which will be available for disaster relief purposes.

#### PREDISASTER PLANNING

The Administrator of FCDA has worked with the States to establish a disaster relief coordinator at the State level. The FCDA has specifically recommended that such authority be vested in the State civil defense director. By June 1955, more than 40 States had authorized their civil defense agencies to participate in disaster relief activities (Report of Subcommittee on Natural Disaster Relief to the Commission on Intergovernmental Relations, June 20, 1955).

On the Federal level, the FCDA has developed a predisaster plan with various Federal agencies in anticipation of major disasters. The plans, in most cases, are represented by memorandums of understanding setting forth the responsibilities of the agencies involved. Such agreements have been completed with the following agencies:

- Department of Agriculture
- Department of Commerce
- Department of Defense
- Department of Health, Education, and Welfare
- Department of Interior
- General Services Administration
- Housing and Home Finance Agency
- United States Civil Service Commission
- United States Coast Guard
- Veterans' Administration

The existence of these agreements enabled the FCDA to act quickly in assigning responsibilities following Hurricane Diane. Disaster Order No. 1 issued on August 20, 1955, listed the following assignments:

1. The Secretary of Defense will be responsible for—
    - (a) Performing on public or private lands protective and other work essential for the preservation of life and property.
    - (b) Debris and wreckage clearance.
    - (c) Emergency repair to and temporary replacement of public facilities, except as reserved herein to other Federal agencies.
  2. The Secretary of Commerce will be responsible for—
    - (a) Determination of damage to industrial facilities.
    - (b) Extending aid for the repair or reconstruction of highways and bridges on primary or secondary Federal-aid highway systems, the National System of Interstate Highways, and on the urban system.
  3. The Secretary of Agriculture will be responsible for—
    - (a) Inspection of meat and meat food products.
    - (b) Providing scientific personnel skilled in physical, biological, chemical, engineering, and veterinary medicine.
    - (c) Providing feed for livestock in accordance with Public Law 115, 83d Congress.
    - (d) Utilization of commodities acquired under price-support programs.
  4. The Secretary of Health, Education, and Welfare will be responsible for—
    - (a) Providing medical, nursing, and other professional and technical personnel to assist in emergency medical care and control of communicable diseases; to assist in the maintenance of an adequate and safe supply of water; safe food supplies; sanitary waste disposal; adequate refuse-disposal facilities; and control of insects and rodents; to investigate epidemics and determine procedure for curtailment thereof.
    - (b) Providing assistance to the survivors of victims of the disaster and prompt settlement of claims of such survivors for OASI benefits.
    - (c) Providing assistance to States in planning for the health and welfare services for children.
    - (d) Providing assistance to State and local officials for continuity, maintenance, and operation of schools and establishment of improvised schools.
  5. The Administrator of the General Services Administration will be responsible for—
    - (a) Providing supplies from Federal common use items.
    - (b) Providing assistance and advice to the State and local government for the preservation, repair, and restoration of essential records, documents, and mail and file services.
    - (c) Providing temporary storage and issue facilities.
  6. The Administrator of the Housing and Home Finance Agency will be responsible for providing temporary housing and other emergency shelter.
- The FCDA also has a formal understanding with the American National Red Cross describing the responsibilities of both agencies in providing disaster assistance.
- To carry out the purposes of Public Law 875, Congress as of June 30, 1955, had appropriated a total of \$59,300,000. On that date, there remained \$10,629,954 available for allocation.
- The following table 46 lists the areas in which Public Law 875 has been invoked up to June 30, 1954:

TABLE 46.—Areas declared "major disaster" under provisions of Public Law 875, 81st Cong.<sup>1</sup>

## EXECUTIVE ORDER 10221—HOUSING AND HOME FINANCE AGENCY

Date of Presidential declaration	Disaster area	Nature of disaster	Federal funds, allocation
May 21, 1951	Minnesota, Minnesota River watershed	Flood	\$50,000
June 6, 1951	Hays, Kans.	do.	25,000
	Total		\$ 75,000
July 14, 1951	Kansas	Mississippi and Missouri River floods.	10,543,000
Do.	Kansas (trailers)		5,050,000
Do.	Missouri		2,525,000
Do.	Oklahoma		260,000
	Reimbursements:		
	Corps of Engineers		2,710,864
	Department of Agriculture		281,268
	Federal Security Agency		104,002
Jan. 29, 1952	South Dakota	Snowstorms	255,000
Mar. 14, 1952	Montana	do.	90,000
Mar. 20, 1952	North Dakota	do.	102,000
Do.	Nevada	do.	150,000
Mar. 25, 1952	Arkansas	Tornado	700,000
Apr. 29, 1952	Tennessee	do.	0
	For purposes of National Production Authority requirements re material control and to allow insurance of Federal Housing Administration mortgages at 100 percent of value.		
Apr. 14, 1952	South Dakota	Flooding of Missouri, Mississippi, and Minnesota Rivers and of the Red River of the North.	250,000
Do.	Iowa		650,000
Apr. 15, 1952	Minnesota		250,000
Apr. 16, 1952	Nebraska		250,000
Apr. 24, 1952	Missouri		650,000
Do.	Kansas		100,000
May 1, 1952	North Dakota		100,000
Apr. 18, 1952	Wrangell, Alaska	Fire	50,000
Apr. 19, 1952	Montana (that portion above Fort Peck Reservoir)	Flood, Milk River	550,000
May 21, 1952	Utah	Flood	563,570
Dec. 11, 1952	Hopkins, Mo.	Tornado	20,000
Oct. 31, 1952	North Carolina, 2 counties		
Aug. 7, 1952	Tennessee	Drought	
Aug. 27, 1952	Alabama, Mississippi		
Aug. 28, 1952	Georgia		
Aug. 7, 1952	Kentucky		
Sept. 17, 1952	Missouri, approximately half		\$ 9,500,000
Aug. 30, 1952	Arkansas		
Sept. 5, 1952	Texas, greater portion		
Oct. 31, 1952	Louisiana, approximately half		
Do.	Oklahoma		
	Total		35,694,704

See footnotes at end of table, p. 207.

TABLE 46.—Areas declared "major disaster" under provisions of Public Law 875, 81st Cong.<sup>1</sup>—Continued

## EXECUTIVE ORDER 10427—FEDERAL CIVIL DEFENSE ADMINISTRATION

Date of Presidential declaration	Disaster area	Nature of disaster	Federal funds, allocation
May 2, 1953	Counties of Muscogee, Macon, Houston, Twiggs and Bibb, Ga.	Tornado.....	\$178,500
May 15, 1953	Waco-San Angelo, Tex.....	do.....	365,000
May 29, 1953	Louisiana.....	Flood.....	424,000
June 2, 1953	Port Huron, Mich.....	Tornado.....	52,036
June 6, 1953	Montana.....	Flood.....	321,400
June 9, 1953	Flint, Mich.....	Tornado.....	143,718
June 11, 1953	Iowa.....	Flood.....	173,664
Do.....	Worcester, Mass.....	Tornado.....	510,000
June 19, 1953	Counties of Orange and Newton, Tex.....	Flood.....	40,800
July 2, 1953	New Hampshire.....	Forest fire.....	152,931
Oct. 3, 1953	Alaska.....	Severe hardship.....	51,000
Oct. 22, 1953	Florida (31 counties).....	Flood.....	255,000
Dec. 6, 1953	Vicksburg, Miss.....	Tornado.....	167,280
Feb. 5, 1954	Angeles National Forest and county of Los Angeles and San Bernardino, Calif.	Flood and erosion.....	(9)
Mar. 17, 1954	City of Macon and Bibb County, Ga.....	Tornado.....	153,000
June 23, 1954	Iowa.....	Flood.....	(9)
June 30, 1953	Area involved includes following States: Alabama, Arkansas, Colorado, Kansas, Kentucky, Mississippi, Missouri, Nevada, North Carolina, New Mexico, Oklahoma, Tennessee, Texas, Utah, Virginia, West Virginia, Wyoming, and Territory of Hawaii.	Drought.....	{ 8,000,000 10,000,000
May 4, 1954	Area involved includes following States: Colorado, Kansas, New Mexico, Oklahoma, and Texas.	Drought (Dust Bowl)....	10,000,000
	Total.....		30,988,329

<sup>1</sup> President's Report to Congress on Administration of Disaster Relief, July 24, 1954 (H. Doc. 479, 83d Cong.).

<sup>2</sup> Funds totaling \$75,000 authorized from President's emergency fund, prior to appropriation to accomplish Public Law 875 assistance.

<sup>3</sup> This Federal allocation was authorized to reimburse the Department of Agriculture for any unrecoverable portion of the cost of procuring, transporting, and distributing livestock food (through the facilities of the Department of Agriculture) in the above-declared drought areas.

<sup>4</sup> No allocation as yet.

## DISASTER RELIEF RESPONSIBILITIES OF INDIVIDUAL FEDERAL AGENCIES

The Federal Civil Defense Administrator in carrying out his responsibilities under Executive Order 10427 has drawn up formal agreements with certain Federal agencies setting forth the disaster relief functions of the individual agencies. In general, these "memorandums of understanding" provide for predisaster planning on both the agency and regional office level; coordination of activities by FCDA; assistance authorized by FCDA and the disaster relief responsibilities of the agency. The following summary lists the responsibilities delegated to each agency in carrying out Public Law 875 and the specific functions authorized to the agencies by other laws. In addition, examples are given where available of aid rendered by the agencies following hurricane Diane.

## CIVIL SERVICE COMMISSION

The FCDA's agreement with the Civil Service Commission provides that the Commission will render assistance in the following manner:

1. Assign a personnel officer and staff necessary to handle the emergency personnel actions of the FCDA office.

2. Supply other Commission personnel with special primary or secondary skills as may be requested by FCDA.
3. Aid by local Commission offices in locating persons with particular skills, recruiting new personnel, and securing Federal employees from other agencies for detail to FCDA.
4. Supply space and equipment in local Commission offices for FCDA where necessary.
5. Release Commission personnel to FCDA when regular essential operations of local Commission offices cannot be continued.

#### DEPARTMENT OF AGRICULTURE

The natural disaster relief activities of the organizational units of the Department of Agriculture can be divided into two categories, namely, the general statutory responsibilities of the Department which are accelerated in major disaster areas and the special responsibilities under Public Law 875. The general statutory responsibilities include the following:

##### *Agricultural Research Service*

The Agricultural Research Service inspects meat and meat products, which move in interstate commerce, for wholesomeness and fitness for human consumption. They exercise control over the movement of livestock from areas where contagious diseases may exist, and quarantine and inspect livestock in affected areas. They also exercise control over plant diseases and insect infestation by quarantine and other restrictions on the transportation of plant and insect pests.

##### *Agricultural Marketing Service*

The Agricultural Marketing Service makes crop reports, in cooperation with States, which provide information on crop acreage, livestock numbers, and general crop conditions. They grade and inspect agricultural commodities for class, quality, and condition on a fee basis. They also arrange for the distribution of food acquired from the Commodity Credit Corporation, or which is available from surplus removal programs to schools, institutions, and needy individuals.

##### *Commodity Stabilization Service*

The Commodity Stabilization Service supplies agricultural commodities through the Commodity Credit Corporation, which generally has substantial inventories which were acquired under price-support programs. In addition to these inventories, the Commodity Credit Corporation also has authority to acquire additional agricultural commodities for resale. Generally, if these sales are at subsidized prices, or donations are made, the Corporation must be reimbursed from supplemental sources.

##### *Federal Extension Service*

The Federal Extension Service furnishes technical advice to clean up damaged property, and for sanitary precautions, water supply, sewage disposal, insect infestation, the use of canned and locker-stored food which has been subjected to interrupted power service, the use of electricity after a disaster, safety of damaged buildings, food and water for livestock, substitute planting for destroyed or damaged crops, grain-storage problems, and the renovation of equipment and farm facilities.

*Farmers' Home Administration*

The Farmers' Home Administration provides agricultural credit to farmers who cannot get credit elsewhere, for farming operations, farm ownership, farm housing, and water facilities. In addition, emergency loan assistance is provided, under section 2 (a) of Public Law 38, 81st Congress, in areas where the Secretary finds a production disaster has occurred. These production disaster loans are today available in 1,535 counties in 37 States.

*Federal Crop Insurance Corporation*

The Federal Crop Insurance Corporation pays indemnities on insured crops that have suffered damage, or complete failure, by reason of disasters such as floods or droughts. This insurance is available to eligible farmers in a restricted number of counties.

*Forest Service*

The Forest Service furnishes personnel and equipment to fight fires in or adjacent to the national forests, and takes other emergency measures in connection with disasters in or adjacent to the national forests.

*Rural Electrification Administration*

The Rural Electrification Administration provides credit and technical assistance to rural electric and telephone systems that are borrowers from REA, for the purpose of restoring and maintaining such power and community services.

*Soil Conservation Service*

The Soil Conservation Service contributes technical advice in dealing with emergency protection against floodwaters, and gives assistance and technical advice in connection with agricultural rehabilitation work following any disaster.

*Agricultural Conservation Program Service*

The Agricultural Conservation Program Service provides administrative facilities for the formation and administration of programs of direct financial assistance to individual farmers for the rehabilitation and restoration of farmland to productive capacity, which was damaged by floods or other natural disasters.

In addition to the above areas of general responsibility, when an area has been designated by the President as a major disaster area under Public Law 875, the Department has the authority to furnish the following additional services to alleviate suffering, hardship, and damage:

*Agricultural Research Service*

The Agricultural Research Service may furnish trained field veterinarians and scientific personnel with special skills in physical, biological, chemical, and engineering research to assist in the rehabilitation of damaged areas.

*Agricultural Marketing Service*

The Agricultural Marketing Service may furnish the administrative structure and direction for the distribution of federally acquired food. This food is distributed to such welfare agencies as the American Red Cross, the Salvation Army, civil-defense agencies, for mass feeding programs, or distribution to individuals.

*Commodity Stabilization Service*

The Commodity Stabilization Service may utilize surplus grains for the feeding of livestock, pursuant to Public Law 115, 83d Congress, and section 301 of Public Law 480, 83d Congress, in areas designated as major disaster areas under Public Law 875. Authority has been delegated by the Federal Civil Defense Administrator to the Secretary of Agriculture to delineate areas affected by the disaster for the purposes of these programs (18 F. R. 4609 et seq.). They may also provide facilities for the acquisition, storage, and handling of both food and livestock feed.

*Farmers' Home Administration*

The Farmers' Home Administration, in addition to the production-emergency loans referred to above, is authorized to make economic-disaster loans to farmers in designated disaster areas, under section 2 (b) of Public Law 38, 81st Congress, and Public Law 115, 83d Congress. At this time, the Department is making economic-disaster loans in 1,096 counties in 20 States that have been designated as major disaster areas by the President under Public Law 875.

Under FHA instructions to all State directors, when a State or portion thereof has been designated by the President as a major disaster area under Public Law 875, the State director will make an immediate and thorough survey of the disaster area to determine the need for accelerated agricultural credit that cannot be met for a temporary period by commercial banks, cooperative lending agencies, the Farmers' Home Administration, under its regular loan programs, or other responsible sources, and make a prompt report to the Department of Agriculture as to the need for such emergency credit under section 2 (a) or 2 (b) of Public Law 38, 81st Congress. The Secretary then designates the areas, within the major disaster area, that are determined by him to be in need of such assistance.

*Forest Service*

The Forest Service supplies all of the services indicated previously and, in addition, upon the designation of an area as a major disaster area, renders additional services in areas other than the national forests, usually working through the State forest service.

*Soil Conservation Service*

The Soil Conservation Service furnishes technical advice and heavy earth-moving equipment for the restoration and rehabilitation of farmland damaged by the major disaster.

## DEPARTMENT OF COMMERCE

The Assistant Secretary of Commerce for Administration is responsible for coordinating the disaster relief activities of the Department's organizational units. These activities are summarized below.

*Business and Defense Services Administration*

The Business and Defense Services Administration has authority under the Defense Production Act to confer priorities with respect to the procurement of materials and products required to fulfill defense production contracts in disaster areas. In cases where BDSA cannot use defense production authority, the agency's industry divisions may endeavor to get suppliers to voluntarily provide materials or products

to meet requirements as they are developed in the disaster area. BDSA, when authorized by the Office of Defense Mobilization, leases Government-owned machine tools and production equipment to any crippled manufacturing establishment in order to restore normal operations and assists in the processing of loans under section 302 of the Defense Production Act.

In the aftermath of Hurricane Diane, BDSA took the following steps:

(1) Arranged with copper producers having Government stockpile contracts to make available to fabricators in the disaster area metal which had been diverted from the Government account. The agency also assisted in obtaining steel, cement, and other building materials.

(2) Made available 1,000 idle tools in the Commerce Department inventory for lease to stricken manufacturers.

(3) Assigned personnel to the disaster area to certify loans for defense production manufacturers.

(4) Assumed the responsibility delegated to the Department of Commerce by the Federal Civilian Defense Administration to determine the amount of damage to industrial facilities.

### *Bureau of Public Roads*

Under the Federal Highway Act of 1952, the Bureau of Public Roads has a revolving, matching fund of \$10 million for cooperative surveys with the States for determining damages to the Federal highway systems and restoration and repair of the systems. The preliminary surveys in the States of Connecticut, Massachusetts, Rhode Island, New York, and New Jersey following hurricane Diane indicated that some \$66 million in damages was sustained by the highway system.

The Bureau is also authorized by the Federal Highway Act (23 U. S. C. 13a) to extend aid for repair or reconstruction of highways and bridges on primary or secondary Federal-aid highway systems when such highways or bridges have been damaged seriously as a result of floods, hurricanes, tidal waves, earthquakes, severe storms, landslides, or other catastrophes covering a wide area. The State highway department must apply for relief following a declaration of emergency by the governor concurred in by the Secretary of Commerce. A total of \$15 million is authorized for the program with the requirement that the Federal share for repair and reconstruction shall not exceed 50 percent of the costs. The Bureau assigned eight engineers, in addition to the local division engineers, to render technical aid in the areas hit by hurricane Diane.

### *Civil Aeronautics Administration*

The Civil Aeronautics Administration functions in disaster areas at the direction of the FCDA in the coordination of emergency search and rescue operations and the transmission of essential information.

### *Weather Bureau*

The Weather Bureau is charged with the responsibility of forecasting the weather, including the issuance of storm warnings (including tornado, hurricane, cold wave, heavy snow and blizzards) and the forecasting of floods and the issue of flood warnings. (The weather forecasting activities of the Weather Bureau are described in more detail elsewhere in this report.)

## DEPARTMENT OF DEFENSE

The Department of the Army has primary responsibility among the military services for provision of disaster relief, with the Navy and Air Force having collateral responsibility. The Army is also charged with the responsibility for the coordination of disaster relief activities of the military services. Following Hurricane Diane, the disaster relief responsibilities of the Department of the Army were assigned to the Corps of Engineers. The disaster work assigned to the corps was in addition to its statutory responsibility for the prevention and control of floods.

The corps provided assistance in 3 ways:

1. Performing work essential for the preservation of life and property.
2. Clearing and removal of debris and wreckage.
3. Emergency repair and temporary restoration of public facilities, such as bridges, water and sewerage facilities.

This work was generally done by contract with local contracting firms, and was financed by temporarily utilizing civil works project construction funds. In the first few days following the hurricane, 20 offices were established in the disaster area and were staffed with 49 engineer officers and 100 civilians.

## DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Pursuant to agreements with the Federal Civil Defense Administration and the American National Red Cross, the organizational units of the Department of Health, Education, and Welfare have disaster relief responsibilities indicated below.

*Public Health Service*

The responsibility of the Public Health Service in the event of a major disaster is to assist the States and local communities to meet the public health problems arising from the breakdown of public works, public services, and other facilities. At the time of such breakdowns, protective measures must be taken promptly because of the hazard of large-scale epidemics of communicable diseases.

The Public Health Service is responsible for assisting the States and local communities in the maintenance of a safe and adequate supply of water; the sanitary collection, treatment and disposal of sewage, garbage and other community wastes; protection against rodents and insects which transmit disease; maintenance of food and milk free from contamination; and emergency medical care and control of communicable diseases.

The PHS has available for emergency assignment members of its staff located throughout the country. Such professional personnel include: Medical and nursing personnel, engineers, entomologists, sanitarians, epidemiologists, veterinarians, and laboratory technicians. The Public Health Service also maintains in reserve certain disaster aid equipment and materials located at five cities: Atlanta, Boston, Dallas, San Francisco, and Topeka. The equipment is broken down into four categories: (1) For emergency water treatment—purification units, storage tanks, main sterilizers, dewatering pumps, hypochlorinators, power generators, motor drying equipment, and disinfecting chemicals; (2) for controlling insects and rodents—equipment for dispersing insecticides including aircraft, and when they cannot be

obtained from commercial sources, insecticides and rodenticides; (3) for transportation—trucks, passenger vehicles and other field vehicles from regular Public Health Service operating units; (4) for emergency immunization—a supply of immunizing agents.

Following Hurricane Diana, commissioned officers of Public Health Service in the following categories and numbers were placed on standby orders to move into the flood areas:

Public health physicians.....	25
Sanitary engineers.....	50
Public health nurses.....	20
Scientists.....	30
<b>Total.....</b>	<b>125</b>

Thirty of these officers were dispatched to the disaster area immediately.

Equipment and material resources were made available as follows:

Mobile water purification units.....	9
Emergency chlorinators.....	10
Water tanks, collapsible.....	50
Pumps.....	50
Automotive equipment.....	50
Water examination units.....	8
Membrane filter packets.....	2, 000
Halozone tablets.....	20, 000, 000
Insecticides.....pounds.....	1, 500
Rodenticides.....do.....	1, 000

#### *Food and Drug Administration*

The Food and Drug Administration has the responsibility of controlling the purity and safety of food and drugs in time of disaster. The FDA pools its forces with those of cooperating State, county, and city food and drug enforcement officials in order to assure that:

- (1) All damaged stocks of food and drugs are impounded;
- (2) Impounded lots are rendered fit for human consumption under supervision of a competent inspector or are destroyed under supervision;
- (3) All damaged food and drug manufacturing and warehousing establishments are closed; and
- (4) Closed factories and equipment and raw materials therein are restored to proper operating condition before resumption of manufacturing operation is permitted.

The forces available to the FDA for this work are: 225 food and drug inspectors and 155 food and drug chemists located in 16 field districts.

In the aftermath of Hurricane Diane, 35 men were assigned by FDA for duty in Connecticut, Massachusetts, Rhode Island, and Pennsylvania, and the entire field staff was alerted to stand by.

#### *Social Security Administration*

1. *Old-age and survivors insurance.*—The principal service available through this program in disaster areas is the provision of prompt assistance to the survivors of insured victims and persons over 65 years of age who have been made jobless by the disaster. Processing of their claims is expedited by the use of teletype lists of victims, together with identifying information. These are prepared by the nearest OASI field office for the purpose of obtaining the wage data required for benefit computation. If necessary, a temporary field office is established in the disaster area.

In disaster situations, OASI field offices are permitted, under regulations dealing with confidentiality of official information, to disclose information concerning the victims for the purpose of locating relatives and identifying persons who are dead, unconscious, or suffering from shock. Such information must be requested in writing by a Federal, State, or municipal official.

2. *Public assistance.*—In event of a major disaster, the regional staff of the Bureau of Public Assistance will, upon request, cooperate with their State agency counterparts in planning and special welfare and consultative services which these agencies may be called upon to render in the disaster area.

3. *Children's Bureau.*—In the event of a major disaster, regional medical directors and child-welfare representatives of this Bureau will, upon request, cooperate with their State agency counterparts in planning the health and welfare services for children which these agencies may be called upon to render in the disaster area.

#### *Office of Education*

In event of a major disaster, the Office of Education could undertake the following:

1. Advise and assist State and local officials in the establishment of improvised schools (in churches, etc.), and in the reestablishment of educational facilities, including the erection of temporary school buildings;

2. To the extent permitted by appropriations, provide financial assistance to local educational agencies for maintenance and operation of schools in federally affected areas under Public Law 874, 81st Congress, and for construction of school facilities under title II, Public Law 815, 81st Congress; and

3. Advise and assist higher education authorities of the State in the reestablishment of colleges and university facilities in the disaster area.

#### *Office of Vocational Rehabilitation*

The Office of Vocational Rehabilitation and the system of State vocational rehabilitation agencies can aid adult disaster victims who sustain disabling injuries which prevent them from returning to suitable employment. Subsequent to the disaster, State agencies, through their rehabilitation counselors, may be called upon to provide an organized program of rehabilitative services including, where applicable, restorative medical and surgical service, training and preparation for employment, prosthetic aids, maintenance while undergoing medical care or job training, placement, and followup.

#### *Office of Field Services (surplus property utilization)*

Public Law 152, 81st Congress, authorizes the Secretary of Health, Education, and Welfare to allocate Federal surplus personal property and to arrange for the transfer of surplus real property for health and educational purposes.

The Surplus Property Utilization Division has representatives assigned to most of the Department's regional offices. In the event of a disaster, the representative in the affected region can authorize the agency for surplus property in the affected State to utilize for disaster relief any surplus Government property warehoused in the vicinity. For example, a State agency for surplus property might help out with reserve stocks of beds, blankets, clothing, and like ma-

terial. Portions of buildings in some areas might also be made available for temporary use as shelter for disaster victims.

## DEPARTMENT OF THE INTERIOR

The specific responsibilities of the Department of the Interior for natural disaster relief stem from the following statutory authorization:

1. In order to facilitate the administration of the national-park system, the Secretary of the Interior is authorized (Public Law 230, 83d Cong.) to use applicable appropriations for:

(a) The rendering of emergency rescue, fire fighting and co-operative assistance to nearby law-enforcement and fire-prevention agencies and for related purposes outside of the national-park system and miscellaneous areas.

(b) The erection and maintenance of fire-protection facilities, water lines, telephone lines, electric lines, and other utility facilities adjacent to any area of the national-park system and miscellaneous areas, where necessary, to provide service in such area.

2. Section 1 (a) of Public Law 633, 79th Congress (16 U. S. C. 17j-2) authorized protection of certain lands and maintenance of certain roads lying outside the boundaries of various areas administered by the National Park Service. Protection and maintenance of these lands and roads implies that the Park Service may meet emergencies when they arise.

3. The National Park Service is authorized (16 U. S. C. 8a, 8b, and 8d) to construct, reconstruct, and improve national park and monument approach roads, and to maintain them. Emergency measures could be taken on these roads.

4. The Bureau of Indian Affairs is authorized, under the supervision of the Secretary of the Interior (23 U. S. C. 13) to direct, supervise, and expend such moneys as Congress may appropriate, for the benefit, care, and assistance of the Indians throughout the United States.

5. The Secretary of the Interior, acting through the Bureau of Mines, is authorized (30 U. S. C. 4k (d)) to expend funds made available to him for the protection or advancement of health or safety in coal mines, and for the prevention of accidents or occupational diseases therein.

## DEPARTMENT OF LABOR

The FCDA has made no delegation of responsibility to the Department of Labor under the authority of Public Law 875, and the Department has no specific statutory responsibilities or authorizations for natural disaster relief. However, the Department has undertaken manpower planning pursuant to a delegation of responsibility under the Federal Civil Defense Act of 1950 in connection with civil-defense emergencies. The operational procedure thus developed was utilized informally in the areas affected by hurricane Diane. In addition, the Federal-State unemployment insurance and employment service programs, which the Department administers, were used to aid workers in the disaster areas.

The Department of Labor provided assistance after hurricane Diane in the following ways:

1. A special reporting procedure was set up for quickly obtaining information on employment and unemployment conditions in the labor-market areas affected by the floods. These reports, which were made available to other Federal agencies, also contained information on the damage sustained by industrial establishments and measures to restore them to operation.

2. The local public employment offices recruited and referred several thousand workers to civil defense and other Government agencies and to private employers for cleanup and rehabilitation work.

3. The State employment security agencies in New England processed more than 43,000 flood-related initial claims for unemployment insurance benefits in the first week following the disaster.

4. The planning developed for civil-defense emergencies was utilized by many local employment offices in making immediate contact with State and local civil-defense authorities; establishing temporary offices where necessary; using radio and sound trucks to inform workers where to report for emergency work; and requesting assistance from employment offices outside the disaster area in the recruitment of workers.

5. The Department, in connection with the administration of the Davis-Bacon Act, issued prevailing wage determinations for Federal contracts for emergency work in disaster areas. Forty-five requests by the United States Army Corps of Engineers were processed in 3 days.

#### DEPARTMENT OF THE TREASURY (U. S. COAST GUARD)

The FCDA's agreement with the Treasury Department provides for the coordination by the Department of the activities of its operating units so that their functions will not break down in the event of a major disaster. Thus the Department is responsible for (1) funds to be available for essential purposes, (2) functioning of a depository system, (3) the continuation of disbursing operations involving payments due from the Government, such as veterans' compensation, pensions and insurance, social-security benefits, as well as payment for work and materials authorized for civil defense, (4) payment of public-debt securities, with particular emphasis on the payment of savings bonds held chiefly by individuals, (5) assuring an adequate supply of paper currency and coins, and (6) rapid release and procurement of medical narcotics.

Since the United States Coast Guard becomes a part of the Defense Establishment during time of war, a separate memorandum of understanding has been agreed upon by that organization and the FCDA. At the national level, the Coast Guard assists the FCDA in drawing plans for the utilization of small craft during periods of disaster. On the local level, the Coast Guard, through its auxiliary, has assisted the State and local directors of civil defense in enrolling small boats and individuals in the small-boat corps and in developing disaster plans. Within the sphere of Coast Guard activities, all civilian small boats in disaster areas are under its control.

## GENERAL SERVICES ADMINISTRATION

The FCDA's agreement with the General Services Administration lists the resources and services available from the constituent operating units of GSA as follows:

*Federal Supply Service*

The Federal Supply Service has a staff experienced in planning and directing large-scale supply and procurement operations; in operating storage and issue warehouses of varying types, sizes, and capacities; and in operating such equipment as lift trucks—both hand-powered and motor-powered—motortrucks, scooters, pallets, and other equipment used in large warehouse operations.

Federal Supply Service would be able to assist in disaster situations by providing the following resources and services:

(a) Inaugurate and provide skeleton supervisory and administrative staff to operate emergency procurement and warehousing operations in disaster areas.

(b) Supply, from stocks on hand in warehouses, those categories of common-use items used generally by Government agencies that will prove useful in disaster operations.

(c) Undertake general procurement and supply operations for wholesale and quantity deliveries from any available source.

(d) Provide temporary storage and issue facilities in such of its warehouses as shall have temporarily unused space available for such purposes during periods of emergency.

*National Archives and Records Service*

The National Archives and Records Service has a staff experienced in the planning and administration of records-management activities, including restoration and repair of damaged documents.

National Archives and Records Service, would be able to assist in disaster situations by providing the following resources and services:

(a) General guidance in the preservation, storage, and use of records.

(1) Advice and assistance in the salvaging of records, moving salvaged records to storage, and preserving them pending rehabilitation.

(2) Advice and assistance in the repair and restoration of damaged records.

(3) Advice as to other available sources for information contained in Federal records destroyed or inaccessible.

(b) Providing of copies of vital records of which security copies are held in Federal records centers.

(c) Advice and assistance in the establishment of emergency mail and file systems at relocation points or at relief stations.

*Public Buildings Service*

The Public Buildings Service has a staff experienced in the design and supervision of construction of new buildings, building repairs and alterations; the procurement, assignment, and control of office space for a large portion of the Federal Government; the operation, maintenance and protection of buildings and the operation of telephone switchboards and a nationwide teletype system.

Public Buildings Service would be able to assist in disaster situations by providing the following resources and services:

- (a) Engineering and architectural service in connection with:
  - (1) Repairs to buildings and demolition.
  - (2) Design and supervision of construction of buildings or temporary structures for office quarters, dormitories, hospitals, warehouses, and structures of similar purpose.
- (b) Assistance in planning and coordinating the assignment of quarters for office or other purposes in existing federally owned or leased buildings or the procurement of office quarters in other locations by lease or through other occupancy arrangement.
- (c) The provision and management of custodial services including protection in new or additional office quarters.
- (d) Communications services through the use of existing communications facilities or by the expansion of existing facilities to cover additional locations.
- (e) The acquisition, operation and management of additional communications facilities not related to present facilities.
- (f) Repairs, demolition, and alteration to buildings by force account utilizing those employees presently engaged in building maintenance in the locality or by the employment and supervision of additional or temporary personnel.

#### HOUSING AND HOME FINANCE AGENCY

The Housing and Home Finance Agency has the responsibility for the following functions:

1. Determining housing needs and existing resources.
2. Determining damage to community facilities.
3. Planning and providing emergency housing.
4. Planning and providing emergency community facilities.
5. Planning and supervising emergency repair and reconstruction of housing and community facilities.
6. Financing of residential repairs and reconstruction.

The HHFA coordinates the activities of its constituent agencies in providing housing aid. The constituent agencies are the Federal Housing Administration, Public Housing Administration, Federal National Mortgage Association, Community Facilities Administration, and Urban Renewal Administration.

#### *Federal Housing Administration*

The FHA Commissioner is authorized by section 203 (h) of the National Housing Act to insure mortgages on single-family residences required to be reconstructed as a result of destruction caused by a catastrophe determined by the President to be a major disaster. The mortgagor must be the owner-occupant of the property, and the maximum amount of the mortgage cannot exceed \$7,000, nor be in excess of 100 percent of the appraised value of the property. As of June 30, 1955, the FHA had insured 1,777 mortgages in the amount of \$12,415,300 under the special program. No commitments for insurance were issued during fiscal year 1955. Only 2 applications were received subsequent to June 30, 1955, and 1 commitment has been issued.

In order to provide relief for homeowners, the FHA may authorize lenders to permit the suspension of payments on insured home loans and on home repair and modernization loans. Following Hurricane Diane, the moratorium period under title I and section 203 of the

National Housing Act in the disaster area was changed from 6 months to 1 year and from 1 year to 2 years, respectively.

The FHA is authorized to extend the mortgage term and reduce the amount of downpayment within the outside limits set by the National Housing Act. Accordingly, for victims of Hurricane Diane the current maximum mortgage term of 25 years was increased to 30 years, and the current 7-percent downpayment on the first \$9,000 was reduced to 5 percent.

In order to assist in meeting the needs for temporary housing, the FHA can make available defaulted FHA-insured housing now owned by the Commissioner.

#### *Public Housing Administration*

The Public Housing Administration can make available federally owned or federally aided housing units for temporary use of homeless disaster victims pending permanent replacement or restoration of seriously damaged housing. Thus, PHA can authorize local housing authorities to make vacancies in federally assisted low-rent public housing projects available for this purpose and to open vacant federally owned war and defense housing.

A total of 332 families in Connecticut, Pennsylvania, New Jersey, Rhode Island, and Massachusetts were rehoused in PHA-administered facilities after Hurricane Diane. In Connecticut, 199 of the 832 units offered by PHA were occupied by families dislocated by the flood. The PHA also had 600 trailers on hand in Portsmouth, Ohio, for such purposes.

#### *Federal National Mortgage Association*

Under its special assistance functions (sec. 305 (a)) of the National Housing Act, the Federal National Mortgage Association can, at the direction of the President, purchase and insure commitments to purchase disaster housing mortgages. The President has authorized \$10 million for the special assistance program with \$3,750,000 of this amount allocated for disaster relief activities. Since June 30, 1955, only \$7,000 has been disbursed for the purchase of a single mortgage.

#### *Community Facilities Administration*

The Community Facilities Administration can assist local public bodies in two ways: (1) by loans of up to 40 years to finance the permanent restoration of community facilities such as waterworks, sewage and drainage systems, etc., and (2) by non-interest-bearing advances for planning public works by local governments to be repaid when construction is authorized and undertaken. The city of East Stroudsburg, Pa., was the recipient of a \$29,420 advance to plan street, water, and sewer facilities which were damaged by the Hurricane Diane floods.

#### *Urban Renewal Administration*

The Urban Renewal Administration is authorized to make grants of up to 50 percent of cost to regional, metropolitan, and community planning agencies for replanning areas subject to recurring disaster, such as floods. Also, the URA provides loans and grants for the regular type of urban renewal projects involving either the clearance or rehabilitation of structures.

After Hurricane Diane, the URA approved survey and planning advances of \$145,000 to Scranton, Pa., \$60,348 to Waterbury, Conn.,

\$87,509 to the Connecticut Development Commission, and \$33,500 to the Rhode Island Development Council.

#### OFFICE OF DEFENSE MOBILIZATION

The activities of the Office of Defense Mobilization in major disaster areas are designed to restore operation of industrial facilities which are essential to the mobilization base. ODM took the following actions to assist industries in the area hit by Hurricane Diane:

1. Authorized accelerated tax amortization for the reconstruction, rehabilitation, or replacement of facilities destroyed by the floods where such facilities are to be used for the production of items necessary in the interest of the national defense. Any of the more than 200 materials or resources covered by ODM expansion goals established since the beginning of the Korean war are deemed items necessary in the interest of the national defense. As required by statute, this authorization was approved by the President.

2. Authorized the issuance of certificates of essentiality to the Secretary of the Treasury to permit the granting of loans under section 302 of the Defense Production Act for the reconstruction, rehabilitation, or replacement of flood-damaged facilities which produce items covered by ODM expansion goals. Loans of this type can be granted to such plants only if financial assistance is not otherwise available on reasonable terms from commercial sources. Approximately \$1 billion was available for loans of this type consisting of \$500 million in uncommitted lending authority plus \$500 million in funds earmarked for long-range programs but not as yet committed.

3. Authorized the Department of Commerce to make use of the priorities and allocations authority under the Defense Production Act where necessary to direct the flow of materials for the rehabilitation of defense plants. This authority was to be used only when the Commerce Department's voluntary program material distribution failed to achieve the desired results.

4. Directed the General Services Administration, Department of Commerce, and Department of Agriculture to divert to the flood areas scarce materials destined for delivery to the Federal Government under existing contracts, and to release materials from the Defense Production Act and Commodity Credit Corporation inventories for use in reconstruction of destroyed defense facilities and to meet defense orders.

5. Directed the Department of Commerce and Department of Defense to lease idle Government-owned production equipment for such periods as were necessary for plants to repair or obtain delivery or equipment to replace equipment destroyed or damaged by the floods. This equipment includes machine tools, secondary metalworking equipment, heat-treating furnaces, heavy power transformers, industrial trucks, tractors and trailers, and testing and measuring machines. The leases could not extend initially for a term of longer than 1 year. Monthly rentals on the equipment are at the rate of 1 percent per month of the acquisition cost with the lessee paying all shipping and installing costs.

6. Directed the Defense Department, Atomic Energy Commission, and the Maritime Administration to channel procurement contracts to defense areas in order to provide employment for displaced workers and to achieve maximum utilization of manpower resources.

## SMALL BUSINESS ADMINISTRATION

The Small Business Administration is authorized by Public Law 163, 83d Congress, to make disaster loans not to exceed a maximum aggregate of \$25 million outstanding at one time. The disaster loans are of 2 types: (1) business loans with a maximum term of 10 years and (2) home loans with a maximum term of 20 years. Both types bear interest at 3 percent per annum. There is no limit on the amount of the individual loans except they cannot exceed the amount of loss sustained. An individual, all corporations or partnerships (regardless of size), churches, eleemosynary institutions, and other nonprofit organizations are eligible for disaster loans.

The following table 47 summarizes the number of disaster-loan applications received and their disposition, from the organization of SBA in 1953 to August 31, 1955:

**TABLE 47.**—*Summary of disaster loan applications received, disposed of, and pending—By periods from organization through August 1955*<sup>1</sup>

[Cents omitted]

Period	Received		Withdrawn		Declined	
	Number	Amount	Number	Amount	Number	Amount
Fiscal year 1954.....	247	\$1,743,814	19	\$74,700	38	\$294,956
Fiscal year 1955.....	1,330	12,202,928	102	1,097,323	153	2,237,502
Fiscal year 1956:						
July 1955.....	78	658,094	8	64,435	2	3,750
August 1955.....	128	2,077,780	7	14,200	3	50,850
Total, fiscal year 1956 to date.....	206	2,735,874	15	78,635	5	54,600
Total to date.....	1,783	16,682,616	136	1,250,658	196	2,587,058

Period	Loans approved		Pending at end of period	
	Number	Amount	Number	Amount
Fiscal year 1954.....	157	\$742,111	33	\$572,192
Fiscal year 1955.....	1,086	7,872,476	22	467,000
Fiscal year 1956:				
July 1955.....	61	415,676	29	534,059
August 1955.....	15	110,714	132	2,430,825
Total, fiscal year 1956 to date.....	76	526,390		
Total to date.....	1,319	<sup>2</sup> 9,140,977		

<sup>1</sup> Financial and Statistical Report on Lending Activities, Small Business Administration, Sept. 15, 1955.

<sup>2</sup> Includes \$73,000 participating bank's share in 1 loan.

The SBA was made responsible in areas damaged by Hurricanes Connie and Diane for the processing of all applications from businessmen and homeowners for disaster loans. The SBA handled applications for the disaster loans authorized by the Small Business Act of 1953, and those authorized by the Defense Production Act to business establishments engaged in defense activities. SBA opened 24 temporary disaster loan offices in Connecticut, New York, Massachusetts, Pennsylvania, Rhode Island, and North Carolina to handle the applications. In addition, through the cooperation of the American Bankers Association, various State associations, and

individual banks, all banks in the disaster area were authorized to process loan applications. As of October 10, 1955, a total of 1,604 applications had been received amounting to \$34,508,386, and 932 loans of \$12,803,728 had been approved in the stricken areas.

#### VETERANS' ADMINISTRATION

The Veterans' Administration has no special statutory authorization or responsibilities to afford relief in the event of a natural disaster. However, the VA in administering its programs can provide assistance in several ways:

1. By permitting borrowers of VA direct and guaranteed loans to temporarily suspend payments in order to assist them in the retention of their property.
2. By permitting lenders to make advances on existing VA-guaranteed loans to repair flood damage. The guaranty may be extended to cover these advances, and the guaranty may also be extended to cover supplemental loans on properties on which VA has guaranteed mortgages.
3. By granting guaranteed loans to eligible veterans with no down-payment and a 30-year maturity.
4. By providing space in VA hospitals for persons injured in a disaster.
5. By speeding allowances to veterans in training programs in the disaster areas.

#### ASSISTANCE BY PRIVATE ORGANIZATIONS

##### AMERICAN NATIONAL RED CROSS

The long record of the American National Red Cross in providing assistance to the people of the United States in time of need dates back to the chartering of this organization by Congress on July 5, 1905. This charter provides in part that the Red Cross shall—

continue and carry on a system of national and international relief in time of peace and apply the same in mitigating the sufferings caused by pestilence, famine, fire, flood and other great national calamities, and to devise and carry on measures for preventing the same.

The Red Cross has established a nationwide organization to carry out its disaster relief responsibilities. At the national headquarters in Washington, the disaster services staff is responsible for overall planning, policies and general supervision of disaster relief operations. This group maintains liaison with Government agencies and national organizations, develops new techniques and materials and supplements area personnel on large operations.

At each of the four area headquarters a disaster services staff carries on disaster preparedness programs and general supervision of relief operations in that area.

On the county level, each of the 3,727 chapters are called upon to organize a special disaster preparedness and relief committee. The responsibilities of this committee include the study of disaster hazards in the chapter territory, surveying the local resources of personnel, equipment, and supplies available for relief, the formulation of cooperative plans with local governmental agencies and other organi-

zations and the development of a procedure for carrying out relief operations.

The relief activities of the Red Cross are classified in two main categories, namely, emergency relief activities and rehabilitation activities. The emergency relief activities are undertaken immediately following a disaster and by agreement with FCDA consist of the following:

### *I. Mass care*

The Red Cross is recognized as the agency responsible for providing mass care to persons immediately following a disaster. Such care is extended to all who apply and is given without family investigation or verification of resources. Such mass care may include one or more of the following services:

(a) Provision of food at fixed or mobile feeding stations or other facilities.

(b) Provision of emergency clothing, to meet immediate needs, either through the utilization of serviceable donated garments or by giving the individually affected family an order for clothing on a local merchant of their choice.

(c) Provision of emergency shelter for disaster victims by:

- (1) assisting them to find shelter with friends or relatives;
- (2) placing them in homes where space has been offered;
- (3) placing them in unoccupied rooms, apartments or houses;
- (4) providing mass shelter in public or private buildings declared by competent authorities to be safe and suitable for housing large numbers of people on a temporary basis; or
- (5) providing tents for family occupancy.

### *II. Medical and nursing aid*

The Red Cross cooperates with and assists local public health officials, physicians, dentists, nurses, and hospitals in providing additional facilities to meet the emergency. Primary responsibility for the care of the sick and the injured rests with the public health authorities and local physicians. Red Cross assistance may include the following services:

- (1) transporting the injured;
- (2) providing additional physicians and nurses to supplement local hospital staffs;
- (3) arranging for care in hospitals;
- (4) establishing emergency medical stations and emergency hospitals;
- (5) furnishing medical and hospital supplies;
- (6) providing medical and nursing service in shelters;
- (7) assigning nurses for bedside care in homes and hospitals.

(The recruitment of nurses in time of disaster is a Red Cross responsibility. The Red Cross has an enrollment of over 30,000 nurses and is therefore able to meet the nursing needs of any disaster area quickly.)

### *III. Warning, rescue, and evacuation*

The Red Cross recognizes the primary responsibility of governmental authorities in warning, rescue, and evacuation. Coordinated plans for these purposes are developed jointly by local government officials, Red Cross chapters, civil-defense directors, and other interested agencies. The Red Cross is prepared to assist persons in a threatened

or actual disaster area to reach places of refuge and in helping to move their personal belongings, including household furnishings, to safety.

#### *IV. Registration and information*

The Red Cross assumes responsibility for maintaining on all disaster operations a registration and information office for—

- (1) registering the disaster sufferers and their needs;
- (2) listing the dead and injured;
- (3) receiving and answering welfare inquiries.

#### *Rehabilitation*

As soon as possible, the rehabilitation phase of the Red Cross program is undertaken. This is the most costly phase of the Red Cross program, accounting for approximately 75 percent of the total relief costs. Families are interviewed to determine what their basic needs are and what resources are available to meet these basic needs. When the full effort and resources of the family are inadequate to meet basic needs, Red Cross assistance is made available.

Assistance may take one or a combination of several of the following:

1. *Food, clothing, and maintenance.*—Generally, this type of assistance is not provided over a long period of time but is extended until other regularly constituted benefits are obtainable in the community.

2. *Building and repair.*—The Red Cross will undertake to assist homeowners with the basic needs in the building and repair of their homes and other essential structures.

3. *Household furnishings.*—Assistance is given to families with the purchase of basic furnishings that are essential to family living.

4. *Medical and nursing.*—Red Cross assistance under this classification is intended for those who are ill or injured because of the disaster, or whose condition is aggravated by the disaster.

5. *Occupational supplies and equipment.*—In considering rehabilitation of families, the planning usually centers around the basic living needs of a family for shelter, household furnishings, and medical and nursing care. In the majority of instances, family income is not affected permanently by the disaster. However, there are some self-employed persons who for various reasons do not have the resources with which to reestablish the basic income required by the family. Assistance under this classification is for the purpose of helping operators of small farm businesses, owners of small family businesses, and those who own their own occupational equipment.

The major policies established by the Red Cross to govern its disaster relief activities are:

1. The Red Cross endeavors to avoid all duplication of the work of other agencies. It does not assume responsibility for governmental functions in time of disaster.

2. The Red Cross extends aid without regard to racial, religious, political, or other affiliation.

3. The Red Cross never confiscates supplies or commandeers services.

4. The Red Cross relief to disaster victims is extended only as necessary to supplement the actual and potential resources of the families and individuals affected.

5. Need and not loss is the basis upon which assistance to disaster victims is given through the Red Cross.

6. The Red Cross does not make loans to families or individuals needing disaster relief; its assistance is an outright gift from the American people, with no obligation to repay.

7. In meeting disaster-caused needs, the Red Cross is not restricted by any rigid categories of relief but extends its assistance in the form that will most directly contribute to the rehabilitation of victims.

8. Situations caused by economic maladjustments, including the usual hazards of industry and agriculture, are not considered to be within the responsibility of the Red Cross for disaster preparedness and disaster relief. However, where there is suffering and want from any cause and fundamental human needs are not being met, Red Cross chapters may participate in community action in extending relief.

9. The Red Cross does not directly assist commercial or industrial concerns, nor does it directly aid educational, charitable, or religious organizations, since these are supported from public funds or themselves seek contributions for their work.

10. Administrative responsibility and financial control are inseparable. In assuming responsibility for relief, therefore, the Red Cross requires that all funds utilized by it in extending relief shall be expended in accordance with its established policies.

11. Insofar as feasible, all relief expenditures by the Red Cross are kept in the normal channels of trade in affected areas.

The following table 48 summarizes the activities of American National Red Cross in the areas hit by the Hurricane Diane floods:

TABLE 48.—Statistical summary of activities of American Red Cross, Eastern States floods, as of October 15, 1955

State	Estimated number family applications	Actual number family applications	Cases closed		Other	Total cases closed	Commitments		
			Emergency assistance	Rehabilitation awards			Mass care and emergency assistance to families	Family rehabilitation awards	Total
Connecticut.....	6,582	6,339	1,925	2,724	225	4,874	\$889,395	\$5,572,655	\$6,462,050
Massachusetts.....	1,916	1,911	864	713	133	1,710	262,566	993,501	1,256,067
Rhode Island.....	622	622	401	181	3	585	48,347	146,111	194,458
New York.....	428	424	195	201	18	414	50,317	181,997	232,314
New Jersey.....	781	781	375	78	321	774	64,118	333,424	397,542
Pennsylvania.....	4,325	4,298	1,782	1,903	333	4,018	467,538	2,204,336	2,671,874
Total.....	14,654	14,375	5,542	5,800	1,033	12,375	1,782,281	9,432,024	11,214,305

#### OTHER PRIVATE ORGANIZATIONS

The American National Red Cross stands out as the foremost private disaster relief agency on the national level. However, many other private organizations make important contributions to aid the victims of disaster. Among these are the Salvation Army, the many religious welfare groups, service clubs, and the national veterans' organizations.

The recently established voluntary home mortgage credit program extended its facilities to persons whose homes were damaged or destroyed by the floods following Hurricane Diane. Persons in the disaster areas who were unable to obtain Federal Housing Admin-

istration-insured or Veterans' Administration-guaranteed home mortgages from a local lender were assisted by the VHMCP in obtaining financing elsewhere.

The American Bankers Association developed a program to assist the Small Business Administration in the processing of applications for disaster loans. Through the cooperation of the ABA, State associations of commercial and savings bankers, and individual institutions, 60 experienced bank credit men helped staff the 24 emergency loan offices established by the Small Business Administration after Hurricane Diane. In addition, each bank in the disaster area was authorized to distribute and process loan applications on behalf of the SBA.

### STATE DISASTER RELIEF ACTIVITIES

The participation of States in natural disaster relief activities varies widely. Some States are well equipped in terms of authority, organization, and funds to assist local governments in their area. Other States are prohibited, either by their State constitutions or other restrictions, from providing assistance other than aid in kind.

The Federal Civil Defense Administration has fostered the development of State and local disaster plans. The States have been urged to vest in the State civil defense director the functions of disaster relief coordinator for the State. More than 40 States have now authorized their civil defense agencies to participate in disaster relief activities.

States are being encouraged to provide sufficient authority and appropriations to enable them to assume more responsibility in natural disaster operations. However, State and local governments are still far from being self-sufficient and still require Federal assistance even in areas where certain types of disasters tend to recur. (See Report of the President Relative to Disaster Relief, H. Doc. 479, 83d Cong., July 26, 1954; Report of Subcommittee on Natural Disaster Relief to the Commission on Intergovernmental Relations, June 1955.)

## APPENDIX A

### FEDERAL LEGISLATION CONCERNING DISASTER RELIEF

[PUBLIC LAW 875—81ST CONGRESS]

[CHAPTER 1125—2D SESSION]

[H. R. 8396]

AN ACT To authorize Federal assistance to States and local governments in major disasters, and for other purposes

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That it is the intent of Congress to provide an orderly and continuing means of assistance by the Federal Government to States and local governments in carrying out their responsibilities to alleviate suffering and damage resulting from major disasters, to repair essential public facilities in major disasters, and to foster the development of such State and local organizations and plans to cope with major disasters as may be necessary.

SEC. 2. As used in this Act, the following terms shall be construed as follows unless a contrary intent appears from the context:

(a) "Major disaster" means any flood, drought, fire, hurricane, earthquake, storm, or other catastrophe in any part of the United States which, in the determination of the President, is or threatens to be of sufficient severity and magnitude to warrant disaster assistance by the Federal Government to supplement the efforts and available resources of States and local governments in alleviating the

damage, hardship, or suffering caused thereby, and respecting which the governor of any State (or the Board of Commissioners of the District of Columbia) in which such catastrophe may occur or threaten certifies the need for disaster assistance under this Act, and shall give assurance of expenditure of a reasonable amount of the funds of the government of such State, local governments therein, or other agencies, for the same or similar purposes with respect to such catastrophe;

(b) "United States" includes the District of Columbia, Alaska, Hawaii, Puerto Rico, and the Virgin Islands;

(c) "State" means any State in the United States, Alaska, Hawaii, Puerto Rico, and the Virgin Islands;

(d) "Governor" means the chief executive of any State;

(e) "Local government" means any county, city, village, town, district, or other political subdivision of any State, or the District of Columbia;

(f) "Federal agency" means any department, independent establishment, Government corporation, or other agency of the executive branch of the Federal Government, excepting, however, the American National Red Cross.

SEC. 3. In any major disaster, Federal agencies are hereby authorized when directed by the President to provide assistance (a) by utilizing or lending, with or without compensation therefor, to States and local governments their equipment, supplies, facilities, personnel, and other resources, other than the extension of credit under the authority of any Act; (b) by distributing, through the American National Red Cross or otherwise, medicine, food, and other consumable supplies; (c) by donating to States and local governments equipment and supplies determined under then existing law to be surplus to the needs and responsibilities of the Federal Government; and (d) by performing on public or private lands protective and other work essential for the preservation of life and property, clearing debris and wreckage, making emergency repairs to and temporary replacements of public facilities of local governments damaged or destroyed in such major disaster, and making contributions to States and local governments for purposes stated in subsection (d). The authority conferred by this Act, and any funds provided hereunder shall be supplementary to, and not in substitution for, nor in limitation of, any other authority conferred or funds provided under any other law. Any funds received by Federal agencies as reimbursement for services or supplies furnished under the authority of this section shall be deposited to the credit of the appropriation or appropriations currently available for such services or supplies. The Federal Government shall not be liable for any claim based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a Federal agency or an employee of the Government in carrying out the provisions of this section.

SEC. 4. In providing such assistance hereunder, Federal agencies shall cooperate to the fullest extent possible with each other and with States and local governments, relief agencies, and the American National Red Cross, but nothing contained in this Act shall be construed to limit or in any way affect the responsibilities of the American National Red Cross under the Act approved January 5, 1905 (33 Stat. 599), as amended.

SEC. 5. (a) In the interest of providing maximum mobilization of Federal assistance under this Act, the President is authorized to coordinate in such manner as he may determine the activities of Federal agencies in providing disaster assistance. The President may direct any Federal agency to utilize its available personnel, equipment, supplies, facilities, and other resources, in accordance with the authority herein contained.

(b) The President may, from time to time, prescribe such rules and regulations as may be necessary and proper to carry out any of the provisions of this Act, and he may exercise any power or authority conferred on him by any section of this Act either directly or through such Federal agency as he may designate.

SEC. 6. If facilities owned by the United States are damaged or destroyed in any major disaster and the Federal agency having jurisdiction thereof lacks the authority or an appropriation to repair, reconstruct, or restore such facilities, such Federal agency is hereby authorized to repair, reconstruct, or restore such facilities to the extent necessary to place them in a reasonably usable condition and to use therefor any available funds not otherwise immediately required: *Provided, however,* That the President shall first determine that the repair, reconstruction, or restoration is of such importance and urgency that it cannot reasonably be deferred pending the enactment of specific authorizing legislation or the making of an appropriation therefor. If sufficient funds are not available to such Federal agency for use in repairing, reconstructing, or restoring such facilities as above provided, the President is authorized to transfer to such Federal

agency funds made available under this Act in such amount as he may determine to be warranted in the circumstances. If said funds are insufficient for this purpose, there is hereby authorized to be appropriated to any Federal agency repairing, reconstructing, or restoring facilities under authority of this section such sum or sums as may be necessary to reimburse appropriated funds to the amount expended therefrom.

SEC. 7. In carrying out the purposes of this Act, any Federal agency is authorized to accept and utilize with the consent of any State or local government, the services and facilities of such State or local government, or of any agencies, officers, or employees thereof. Any Federal agency, in performing any activities under section 3 of this Act, is authorized to employ temporarily additional personnel without regard to the civil-service laws and the Classification Act of 1923, as amended, and to incur obligations on behalf of the United States by contract or otherwise for the acquisition, rental, or hire of equipment, services, materials, and supplies for shipping, drayage, travel and communication, and for the supervision and administration of such activities. Such obligations, including obligations arising out of the temporary employment of additional personnel, may be incurred by any agency in such amount as may be made available to it by the President out of the funds specified in section 8. The President may, also, out of such funds, reimburse any Federal agency for any of its expenditures under section 3 in connection with a major disaster, such reimbursement to be in such amounts as the President may deem appropriate.

SEC. 8. There is hereby authorized to be appropriated to the President a sum or sums, not exceeding \$5,000,000 in the aggregate, to carry out the purposes of this Act. The President shall transmit to the Congress at the beginning of each regular session a full report covering the expenditure of the amounts so appropriated with the amounts of the allocations to each State under this Act. The President may from time to time transmit to the Congress supplemental reports in his discretion, all of which reports shall be referred to the Committees on Appropriations and the Committees on Public Works of the Senate and the House of Representatives.

SEC. 9. The Act of July 25, 1947 (Public Law 233, Eightieth Congress), entitled "An Act to make surplus property available for the alleviation of damage caused by flood or other catastrophe", is hereby repealed.

Approved September 30, 1950.

## PUBLIC LAW 107—82D CONGRESS

### CHAPTER 293—1ST SESSION

[H. J. Res. 303]

JOINT RESOLUTION To provide housing relief in the Missouri-Kansas-Oklahoma flood-disaster emergency

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled*, That section 8 (b) (2) of the National Housing Act, as amended, is hereby amended (1) by inserting after the word "construction" in both places where it appears therein the words "or reconstruction", and (2) by striking out the words "And provided further" in the last proviso thereof and inserting in lieu thereof the words "Provided further" and by inserting at the end of said last proviso a colon and the following: "And provided further, That, where the mortgagor is the owner and occupant of the property and establishes (to the satisfaction of the Commissioner) that his home, which he occupied as an owner or as a tenant, was destroyed or damaged to such an extent that reconstruction is required as a result of a flood, fire, hurricane, earthquake, storm or other catastrophe, which the President pursuant to section 2 (a) of the Act entitled 'An Act to authorize Federal assistance to States and local governments in major disasters, and for other purposes' (Public Law 875, Eighty-first Congress, approved September 30, 1950), has determined to be a major disaster, such maximum dollar limitations may be increased by the Commissioner from \$4,750 to \$7,000, and from \$5,600 to \$8,000, respectively, and the percentage limitation may be increased by the Commissioner from 95 per centum to 100 per centum of the appraised value".

SEC. 2. Section 3 of the Act entitled "An Act to authorize Federal assistance to States and local governments in major disasters, and for other purposes" (Public Law 875, Eighty-first Congress, approved September 30, 1950), is amended by inserting in clause (d) of the first sentence thereof after the words "in such major

disaster" the following: "providing temporary housing or other emergency shelter for families who, as a result of such major disaster, require temporary housing or other emergency shelter,".

Approved August 3, 1951.

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PUBLIC LAW 134—83D CONGRESS

CHAPTER 225—1ST SESSION

[S. 2199]

AN ACT To allow States during major disasters to use or distribute certain surplus equipment and supplies of the Federal Government

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That section 3 of the Act entitled "An Act to authorize Federal assistance to States and local governments in major disasters, and for other purposes," approved September 30, 1950 (64 Stat. 1109), as amended, is amended by striking out clause (c) and inserting in lieu thereof the following:

"(c) by donating or lending equipment and supplies, determined under then existing law to be surplus to the needs and responsibilities of the Federal Government, to States for use or distribution by them for the purposes of the Act including the restoration of public facilities damaged or destroyed in such major disaster and essential rehabilitation of individuals in need as the result of such major disaster;".

Approved July 17, 1953.

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EXECUTIVE ORDER NO. 10427—ADMINISTRATION OF DISASTER RELIEF

By virtue of the authority vested in me by the act of September 30, 1950, entitled "An Act to authorize Federal assistance to States and local governments in major disasters, and for other purposes" 64 Stat. 1109, as amended (42 U. S. C. 1855 ff.), hereinafter referred to as the act, and as President of the United States, it is hereby ordered as follows:

SECTION 1. The following-described authority and functions shall be exercised or performed by the Federal Civil Defense Administrator:

(a) The authority conferred upon the President by section 3 of the act to direct Federal agencies to provide assistance in major disasters.

(b) The authority conferred upon the President by section 5 (a) of the act to coordinate the activities of Federal agencies in providing disaster assistance, and to direct any Federal agency to utilize its available personnel, equipment, supplies, facilities, and other resources, in accordance with the authority contained in the act.

(c) The preparation of proposed rules and regulations for the consideration of the President and issuance by him under section 5 (b) of the act.

(d) The preparation of the annual and supplemental reports provided for by section 8 of the act for the consideration of the President and transmittal by him to the Congress.

SECTION 2. In order to further the most effective utilization of the personnel, equipment, supplies, facilities, and other resources of Federal agencies pursuant to the act during a major disaster, such agencies shall from time to time make suitable plans and preparations in anticipation of their responsibilities in the event of a major disaster. The Federal Civil Defense Administrator shall coordinate on behalf of the President such plans and preparations.

SECTION 3. To the extent authorized by the act, the Federal Civil Defense Administrator shall foster the development of such State and local organizations and plans as may be necessary to cope with major disasters.

SECTION 4. Nothing in this order shall be construed to prevent any Federal agency from affording such assistance and taking such other action as may accord with the existing policies, practices, or statutory authority of such agency in the event of any disaster which will not permit delay in the commencement of Federal assistance or other Federal action, and pending the determination of the President whether the disaster is a major disaster: *Provided*, That such assistance and such other action shall be subject to coordination by the Federal Civil Defense Administrator, acting on behalf of the President.

SECTION 5. The Federal Civil Defense Administrator may delegate any authority or function delegated or assigned to him by the provisions of this order to any

other officer or officers of the Federal Civil Defense Administration or, with the consent of the head thereof, to any other Federal agency.

SECTION 6. Federal disaster relief provided under the act shall be deemed to be supplementary to relief afforded by State, local, or private agencies and not in substitution therefor; Federal financial contributions for disaster relief shall be conditioned upon reasonable State and local expenditures for such relief; the limited responsibility of the Federal Government for disaster relief shall be made clear to State and local agencies concerned; and the States shall be encouraged to provide funds which will be available for disaster relief purposes.

SECTION 7. As used herein, the terms "major disaster" and "Federal agency" shall have the meanings ascribed to them in the act.

SECTION 8. So much of the records of the Housing and Home Finance Agency relating to the activities delegated by Executive Order No. 10221 as the Housing and Home Finance Administrator and the Federal Civil Defense Administrator shall jointly determine shall be transferred to the Federal Civil Defense Administration.

SECTION 9. Executive Order No. 10221 of March 2, 1951 (16 F. R. 2051), is hereby revoked: *Provided*, That the Housing and Home Finance Administrator is hereby authorized and directed to carry out and complete all activities, including reports thereon, provided for by that order in connection with any disaster determined, in accordance with the provisions of the act and prior to the effective date of this order, to be a major disaster: *And provided further*, That the Housing and Home Finance Administrator shall prepare the annual and supplemental reports provided for by section 8 of the act for the calendar year 1952 for the consideration of the President and transmittal by him to the Congress.

SECTION 10. This order shall become effective January 16, 1953.

HARRY S. TRUMAN.

THE WHITE HOUSE, January 16, 1953.

## IX. DISASTER INSURANCE AVAILABLE

### BASIC CONCEPTS OF INSURANCE AND REINSURANCE

For reference purposes, it seems well to set down at this point certain basic concepts of insurance and reinsurance.

If a person has an interest capable of pecuniary estimation, and that interest is subject to a peril that will cause loss to the person bearing the risk, and a second person assumes this risk, we have an example of a risk-shifting device, but not insurance. If in addition to the foregoing, the assumption of risk forms part of a general scheme to distribute actual losses among a large group having similar risks and the insured makes a ratable contribution to a general insurance fund (a premium), we have an example of insurance, according to Vance on Insurance.

As noted in the *Encyclopaedia Britannica*:

the principle of insurance was admirably stated by a select committee of the House of Commons who, in reporting (in 1825) on the laws relating to friendly societies, said: "Whenever there is a contingency, the cheapest way of providing against it is by uniting with others, so that each man may subject himself to a small deprivation, in order that no man may be subjected to a great loss. He, upon whom the contingency does not fall, does not get his money back again, nor does he get for it any visible or tangible benefit; but he obtains security against ruin and consequent peace of mind. He, upon whom the contingency does fall, gets all that those, whom fortune has exempted from it, have lost in hard money, and is thus enabled to sustain an event which would otherwise overwhelm him."

Insurance serves as an incentive to control risks by encouraging the adoption of preventive measures to diminish the waste or loss the risk of which occasions the insurance plan. The insurer profits from such prevention and the insured benefits from lower premium rates.

Marine risks were the subject of the earliest known forms of insurance. Some authorities state that such insurance began in Italy as part of the general law merchant, entering England with the Lombards.

Bodies for registration of policies and recordation of their terms for reference in case of dispute were established in Barcelona, probably in the 13th century, in Bruges in 1310 and in London under a patent from Queen Elizabeth I in 1574.

Until recent times, insurance was limited to marine, fire, and life risks. The earliest known life insurance policy dates from 1583. Modern developments have added such insured risks as persona, accident, sickness, employers' liability, burglary, motoring, aviation and livestock loss.

Commercial insurance of every class has continued to expand. In the field of life insurance, group insurance is the most recent notable development. It originated in the United States. Under it, an employer effects a year-to-year insurance on the life of each of his employees by means of a single policy on the whole staff. Another fairly recent development is mortgagor insurance whereby, for a premium, the insuring company agrees to pay off the mortgage balance at the death of the mortgagor, relieving his surviving family of this worry.

It has been stated that while a majority of insurance is conventional, there is practically no type of contingency for which insurance protection cannot be obtained from adventurous underwriters at Lloyds of London or elsewhere; but the portion of the risk insured is subject to careful selection in such unusual cases.

Reinsurance is a transaction whereby a person who has insured a risk lays off part or all of that risk with another person. Its purpose is to relieve the original insurer from a liability too heavy for him to carry. No privity of contract exists between the reinsurer and the original insured, so the latter can't sue the former to recover any part of an insured loss. The insured's claim is against the original insurer for the full amount of the policy, without regard to whether the original insurer has reinsured all or part of the risk.

Terminology generally applicable to a reinsurance transaction is as follows:

Ceding company—the original insurer that reinsures.

Reinsurer—the accepting company.

Cession—the reinsurance transaction.

Evidence of reinsurance is found at least as early as the first half of the 18th century. Normally insurers wrote only the risk they were prepared to keep. If a larger amount of insurance were desired, added coverage was obtained by a separate policy with another insurer. This was coinsurance rather than reinsurance. The insured had privity of contract with each insurer.

In 1746, an act of Parliament outlawed the practice of reassurance, although there is some thinking that this merely meant to prohibit double insurance or insuring property for more than its worth. It remained illegal until 1864. The practice developed only slowly well into the 19th century and became important and widespread only during recent decades.

The two main branches of reinsurance are facultative (optional) and treaty (automatic or obligatory).

In its original form reinsurance was facultative. Each risk was offered for reinsurance separately and the ceding company retained free choice as to where it would offer the business. The requested reinsurer also retained freedom to accept or decline the reinsurance risk. The method becomes cumbersome for many transactions. The particulars of the risk are shown on a slip to the prospective reinsurer. If it decides to accept, the reinsurer initials the slip. A request note follows in the form of a formal demand by the ceding company to the reinsurer for the specified reinsurance. Upon this the reinsurer issues its "take" note, constituting its official acceptance pending issue of a reinsurance policy. The policy issuance forms the reinsurance contract. It is the final stage in the transaction. Obviously this system served best when transactions were few in number. For larger numbers, the reinsurance treaty developed.

A reinsurance treaty is a contract by which the ceding company binds itself to cede, and the reinsurer binds itself to accept, a fixed share of every risk of the nature set out in the contract, which the ceding company has to reinsure. The treaty covers all risks of a given class as distinguished from the facultative method of covering each risk on a case-by-case basis. The treaty eliminates the power of choice of the reinsurer, as the treaty parties bind themselves regarding offer and acceptance of reinsurance. Mutual advantage

results. The ceding company is assured in advance it can obtain reinsurance. The reinsurer is assured of a steady flow of reinsurance business under the treaty as long as the ceding company issues insurance policies. Under treaty conditions, the reinsurer's liability dates from the same time as the ceding company's liability. The treaty in turn binds the ceding company to place its reinsurance with treaty parties and prevents its choosing to place some reinsurance with one party and other reinsurance with another. Normally many reinsurers become parties to a single treaty, each accepting a specified portion of the reinsurance business ceded.

Generally three kinds of treaties are used: 1. Quota-share or open; 2. Surplus; 3. Excess of loss.

Under the quota-share treaty the ceding company agrees to cede a fixed share of each risk it accepts. This counteracts the tendency of a ceding company to reinsure only second-class risks, for it compels it to reinsure every risk it accepts, whether good or bad, large or small. Because of this compulsion, this type of treaty is used mainly by small companies, which can obtain reinsurance only by offering attractive terms.

The surplus treaty is in common use. In this the ceding company fixes the amount it will keep, called its "retention," the remainder of the insured amount being called the "surplus." The surplus is divided among reinsurers according to the proportion fixed by the treaty. Normally the surplus is divided by percentages, each reinsurer taking 1 percent or more as agreed. The ceding company under the surplus treaty governs its retention, which in turn controls the amount ceded for reinsurance.

Under the excess of loss treaty, no part of any individual risk is reinsured. Rather, the ceding company guards against catastrophic claims by arranging to reinsure only the excess of any single loss over an agreed figure. For example, a ceding company may reinsure 100 percent of its loss over \$125,000 on any one fire up to a loss of \$250,000. If a fire results in loss to the ceding company of not more than \$125,000, the reinsurer pays nothing to the ceding company, but if the loss, for example, is \$175,000 and there are 5 reinsurers sharing equal proportions in the treaty, each would be required to pay one-fifth or 20 percent of the excess loss between \$125,000 and \$175,000. Therefore the excess loss of \$50,000 would require payment of \$10,000 by each reinsurer. This type of treaty has been used considerably for auto and fire coverage. It is often used in conjunction with a surplus treaty for fire coverage in order to protect the ceding company against too heavy individual risk losses and also against heavy conflagration losses.

*Reinsurance conditions.*—Normally conditions of reinsurance are the same as those applicable to the original insurance. The reinsurer receives the same rate of premium and pays its proportionate share of each approved claim. Under an excess of loss treaty, however, the reinsurer receives no specific premium, but instead gets a percentage of total premium income received by the ceding company from the class of business reinsured. In marine reinsurance, the practice of reinsuring risks affected by a possibility of loss results in a much higher reinsurance premium than is charged on the original policy in some cases.

The reinsurer's share of premium is subject to a commission deduction, ranging from 20 to 35 percent or sometimes as high as 45 percent. This covers the agent's commission paid on the original insurance and part of the ceding company's operating expense of obtaining and dealing with the business. The reinsurance commission rate tends to vary with this expense and with the quality of the treaty. Treaties giving good results command better terms by lower commissions.

In addition to the commission deducted from premium, the reinsurer also has to pay a commission (usually about 10 percent) on treaty profits. Thus a good treaty receives better terms than a bad one. Treaty profit is computed after providing for claims and liabilities outstanding at year's end. The commission is usually payable on the basis of average profit for the year of account and of the two preceding years. This prevents a reinsurer from being required to pay part of its profits in a year following 1 or 2 years of heavy loss.

The reinsurer also obtains the right to share in salvage amounts. The ceding company controls loss settlements and may settle or contest a claim as it deems fit. The reinsurer follows the ceding company's decision.

Disputes among parties to reinsurance treaties are nearly always settled by arbitration.

A *bordereaux* is a statement in which the ceding company gives the reinsurer the details of a risk. It sets forth the insured's name and address, the nature of risk, the sum insured, the premium, the amount reinsured and the reinsurance premium. It is not customary to issue reinsurance policies under treaties, as the treaty itself takes the place of such policies. Exceptions existed in the case of British marine insurance.

Retrocession is reinsurance to the second degree. It is the process by which a reinsurer arranges treaties to cede its own surplus lines of reinsurance. If a reinsurer is party to many treaties, it may receive several shares of the same insured risk under different treaties. Retrocession affords a means of ceding a portion of that reinsurance risk.

Reinsurance business has increased considerably in the United States in recent years.

A variation of the treaty is a pool or syndicate, where many companies agree to share all insurance in a given territory on preagreed portions of premiums and losses.

Most of the foregoing material under this heading comes from the *Encyclopedia Britannica*.

#### TYPES OF DISASTER INSURANCE AVAILABLE

Against property damage from the disasters mentioned earlier in this study, some type of commercial insurance appears to be available from private or public sources, with the exception of (1) flood, tidal wave, and certain water damage from hurricanes and (2) air pollution. Against personal injury or death due to these disasters, accident, health, and life insurance is generally available from private or public sources.

*Personal injury, illness, or death from natural disaster.*—The American Life Convention, the Life Insurance Association of America, the Bureau of Accident and Health Underwriters, and the Health and Accident Underwriters Conference, at the request of the staff of this committee, have cooperated in furnishing the following information concerning personal insurance and natural disasters.

Floods and other natural disasters do not pose the difficulties for personal insurance that they do for property insurance. As used here, personal insurance includes life insurance and accident and health insurance. Among the difficulties encountered in insuring property against damage by flood is the fact that no broad distribution of the risk can be obtained. The risk of injury or death as a result of natural disaster is a very small fraction of the total risk of death or of injury or death by accidental means, and no problem of adverse selection is created. The house that is close to a river is bound to suffer damage if the water rises high enough, but the inhabitant of that house is still unlikely to be injured and less likely to be drowned. It seems reasonable to conclude that the chances of either injury or death due to natural disaster are about the same for one person as for another regardless of where he lives or what he does, and for anyone the chances are very small. It is almost impossible to conceive of a reasonable person being motivated in the purchase of insurance by a belief that he is overly exposed to the risk of injury, disease, or death due to natural disaster.

The Metropolitan Life Insurance Co. has for a number of years included in the December issue of its statistical bulletin an article with current figures and facts on accidental deaths in the United States. These figures show that during the 8 years, 1947-54, there were approximately 750,000 accidental deaths in the United States, and 1,411 of these resulted from natural disasters such as floods, hurricanes, tornadoes, and blizzards (excluding any individual disasters where the loss of life was less than 25). This shows what an insignificant part natural disasters play in the total field of accidental death. Within the field of life insurance, where the comparison would be with total deaths, this part would be even more insignificant.

In the field of accident insurance, the same overall pattern applies. In the year 1954 there occurred approximately 9,054,000 accidents and 90,000 of these resulted in death. Of these 90,000 accidental deaths, 168 were due to natural disasters, a ratio of 0.2 percent. Similar ratios for injuries resulting from natural disasters to the total number of injuries of all kinds are not readily available but would probably follow the same pattern.

In the field of health insurance, the problem is equally insignificant. There is, of course, a chance of epidemic and disease following certain types of disasters, but the risk thereof is believed sufficiently low so as not to require special attention or treatment in providing coverage, but is included as part of the general health coverages.

At the end of 1954, life insurance protection in this country totaled \$334 billion in 237 million individual policies covering 93 million policyholders. The amount of insurance providing additional benefits in case of death by accidental means (double indemnity) was \$118 billion. Similarly at the end of 1954, more than 100 million persons had some form of hospital expense, surgical expense, medical expense, loss of income or accidental death or dismemberment protection, which in the aggregate, paid \$2.7 billion in benefits. Without known exception, none of the policies providing the coverages referred to above exclude injury, disease or death due to natural disasters. The fact that injuries, diseases or death due to natural disasters are not excluded has a negligible effect on the cost to the policyholders.

From information furnished by the cooperating groups in the field of personal insurance, it appears that wide coverage is available from

private insurers to indemnify against personal injury, illness or death due to natural disasters. The same conclusion seems generally warranted with respect to insurance programs in these fields sponsored by public bodies. No opinion is expressed here as to the advisability of certain additional health insurance programs of the nature of those proposed to the Senate Labor and Public Welfare Committee during the first session of this Congress, as they are not primarily related to natural disaster or war damage insurance problems.

With specific reference to war damage personal insurance, it is understood that a lack of uniformity prevails depending on the type of coverage. Most life insurance policies contain no clause excluding liability for personal injury, illness or death due to perils of war. Policies of this nature issued in wartime often contained war risk exclusion clauses for injury, illness or death incurred by combatants due to war causes. Current practice is to include war damage risks in life policies now being written. Accident policies tend to exclude war risk in wartime and peacetime. In the case of health insurance, however, no attempt is made to exclude war risk from coverage. Whether outstanding workmen's compensation insurance policies provide coverage against war risk is a matter of debate, hinging on whether the war damage would be construed to constitute an occupational hazard covered by the insurance.

*Property damage.*—To a limited extent, private insurers offer protection against flood risks, but most of this protection is available only for movable or personal property. The only immovable or real property so covered seems to be bridges and tunnels, which can be insured against flood risks as well as many other forms of risk under an all-risk policy. This appears to be a historic development in the field of marine insurance, a shining exception to the lack of flood insurance on real property. All-risk insurance on bridges and tunnels is justified because of the careful selectivity used by carriers in providing such insurance, following individual inspection and consideration of the exposure to risk. The flood component of this exposure actually is said to form only a relatively small portion of the risks insured against under such a policy in most cases. When it is considered that such insurance is carried on large revenue-producing bridges like the George Washington Bridge high above the Hudson River between New York City and New Jersey, it can be appreciated that the flood risk to such a structure is small. While flood risk may be comparatively greater in the case of tunnel approaches, even recoverable damage on this account is rare.

A second type of flood risk covered by private insurance policies is flood damage to motor vehicles insured under a comprehensive coverage in the form of the usual third-party liability policy with an extended coverage endorsement.

A third type of coverage takes care of flood risk on merchandise in transit or on consignment. This can be covered by an Inland Marine policy.

A fourth category of insurance protects cargo, tugs and equipment, yachts, and merchandise in transit or in storage on piers and in warehouses against loss resulting from high water or floodtides.

Finally, in the same general class of all-risk policy coverage as bridges and tunnels, we find contractors' equipment, dredges, jewelry, furs, art objects, and certain other personal property protected against

flood and other risks under so-called floater policies, meaning they are insured regardless of their many changes in location.

It has also been noted that insurance companies are subjected to indirect flood-risk coverage under their standard policies against fire insurance. This occurs where a flood becomes the proximate cause of a fire causing losses payable by the insurer under a fire policy. One instance cited was the ignition of a floating tank of oil by contact with a live wire during the 1951 Kansas City flood.

But direct insurance coverage in special fields against flood risk and indirect coverage against such risk as just noted still leave a tremendously large amount of property for which private insurers presently offer no flood-risk coverage. The residential homeowner may easily obtain insurance on his home against the risk of fire and a large variety of other risks under extended coverage clauses, but he cannot, generally, commercially obtain insurance against flood damage to that home. Owners of commercial and industrial real property encounter the same difficulty. Even mortgagees holding home mortgages insured by the Federal Housing Administration have learned that the mortgage insurance does not cover flood risk (although VA guaranteed or insured home mortgages do in effect cover flood risk).

When a home covered by a standard fire-insurance policy with extended coverage is damaged by a hurricane or other severe storm, legal right to recover on the policy may well hinge on whether the damage was caused by the wind or the water component of the hurricane or other storm. If by wind, the claim for damage is allowable; if solely by water, the insurer may successfully contest a claim under the policy. Differences of opinion regarding which of these perils caused the damage during a hurricane have led to legal action against insurers under outstanding insurance policies.

While insurers assert they are liberal in the settlement of such claims, they have the opportunity to decline to pay for damages caused solely by water during a hurricane. From the standpoint of legal liability, insurers are in a much better position than if the insurance policy clearly covered water damage as well as wind damage resulting from a hurricane. This appears to be the field of insurance in which private insurance companies come closest to providing insurance protection against flood risk.

The standard extended coverage endorsement on a standard fire-insurance policy insures, among other things, against direct loss by windstorm and hail. It expressly excludes liability for loss caused directly or indirectly by (2) frost or cold weather, (b) ice (other than hail), snowstorm, sleet, waves, tidal wave, high water, or overflow, whether driven by wind or not. It also expressly excludes liability for loss to the interior of the insured building or property caused—

(a) by water, rain, snow, sand, or dust, whether driven by wind or not, unless the building or property covered shall first sustain an actual damage to roof or walls by the direct force of wind or hail and then shall be liable for loss to the interior of the building or property covered therein as may be caused by water, rain, snow, sand, or dust entering the building through openings in the roof or walls made by direct action of wind or hail or (b) by water from sprinkler equipment or other piping, unless such equipment or piping be damaged as a direct result of wind or hail.

To summarize, this provision does not give the insured protection against interior damage from storm water unless it gained access to the

building via an opening in the roof or walls made by wind or hail. It offers no protection against interior wall seepage such as occurred in the Washington, D. C., area as a result of Hurricane Connie in 1955.

The standard extended coverage clause also provides that unless appropriate liability is expressly assumed elsewhere in the insurance policy, the insurance company shall not be liable for damage to a seawall or a wharf, dock, pier, boathouse, bulkhead, or other structure located over or partially over water and the property in any such structure. The clause under the same conditions, also excludes liability for fences, property line and similar walls, and certain other service buildings and equipment.

An additional extended coverage endorsement is available on terms of \$50 deductible, against perils of water damage from plumbing and heating systems, vandalism and malicious mischief, vehicles owned or operated by the insured or any tenant, glass breakage, ice, snow and freezing, fall of trees, and collapse. However, this expressly excludes loss caused directly or indirectly by flood, inundation, waves, tide or tidal wave, high water or overflow of streams or bodies of water, whether driven by wind or not, as well as excluding loss caused directly or indirectly by the backing up of sewers or drains or by earthquake.

The additional extended coverage endorsement also expressly provides that the company is not liable for damage to plumbing and heating systems unless they first suffer actual damage by any peril insured against under the policy except water damage. Exclusion of liability is also claimed for damage to such systems by freezing if the building was unoccupied or unheated for over 72 hours immediately preceding the loss, unless the water supply had been shut off and the systems drained during that 72-hour period. Moreover, the insurance does not cover the bursting of a steam or hot-water heating system due to ice.

The insurance provided by the additional extended coverage endorsement against loss by ice, snow, or freezing covers only physical injury to or destruction of property from (a) collapse of a building or part of it by reason of the weight of ice, snow, sleet, or hail; (b) a fall against the building of objects due to ice, snow, sleet, or hail; or (c) damage to plumbing or heating systems and domestic appliances or air-conditioning systems caused by freezing, provided the building was occupied and heated within 72 hours preceding the loss, or provided the water supply had been shut off and the plumbing and heating systems, domestic appliances, and air-conditioning systems had been drained.

The foregoing illustrates the care with which insurance companies using such provisions exclude themselves from liability for flood, tidal wave, and the risk of damage from water in its various liquid and solid forms.

The reasoning which prompts private insurers not to enter into insurance of these risks is well set forth in the May 1952 Report on Floods and Flood Damage issued by the Insurance Executives Association as follows:

Because of the virtual certainty of the loss, its catastrophic nature, and the impossibility of making this line of insurance self-supporting due to refusal of the public to purchase such insurance at the rates which would have to be charged to pay annual losses, companies generally could not prudently engage in this field of underwriting.

### The association concluded:

It is our considered opinion that insurance against the peril of flood applicable to fixed property cannot successfully be written and that any specific promise of indemnity for loss by flood must therefore be regarded as in the nature of a subsidy or relief payment, which are quite outside the scope of private business and of insurance \* \* \*. As a long-range program, it appears that an accelerated flood-control program supplemented by such relief payments as are necessary on account of flood damage would be more in the interest of the public than a program of so-called flood insurance which could not be self-supporting.

This report represented an outgrowth of a study of the feasibility of flood insurance undertaken by the association following the disastrous 1951 and 1952 floods in the Midwestern United States. The association under the chairmanship of Mr. J. V. Herd, engaged the engineering consultant firm of Parsons, Brinckerhoff, Hall & Macdonald of New York to study and report on the feasibility of rating flood insurance. The association's view of the conclusions in the engineering report was stated as follows:

The report clearly demonstrates that on a purely theoretical basis specific flood insurance could be rated and could be written if certain fundamental requirements of insurance could be met. Practical considerations make it obvious that the fundamental requirements of insurance could not be met in a specific flood insurance undertaking and the committee has therefore reluctantly concluded that specific indemnity for loss by flood cannot be provided by insurance as such.

In 1951 and 1952 under the auspices of the Associated Factory Mutual Fire Insurance Cos., consisting of six separate insurance companies, with headquarters in Providence, R. I., a study was made to determine whether or not policyholders were interested in flood-insurance coverage. Table 49 gives a summary of the results of a flood-damage questionnaire mailed to policyholders by 4 of the 6 companies.

TABLE 49.—*Flood damage questionnaire*

SUMMARY: BOSTON, MANUFACTURERS, BLACKSTONE, ARKWRIGHT

	Boston	Manu- facturers	Black- stone	Ark- wright	Total
1. (a) Letters sent.....	1, 100	2, 723	850	500	5, 173
(b) Replies received.....	337	568	181	122	1, 208
Percent of letters sent.....	31	21	21	24	23
2. (a) Negative replies, unqualified.....	144	249	80	46	519
(b) Negative replies, with comments.....	37	60	35	29	161
(c) Total negative replies.....	181	309	115	75	680
Percent of replies received.....	54	54	63	61	56
3. Affirmative replies.....	156	259	66	47	528
Percent of replies received.....	46	46	37	39	44
(a) Property not subject to flood.....	91	163	130	122	306
Percent of replies received.....	27	29	17	18	25
Percent of affirmative replies.....	58	63	45	47	58
(b) Property is subject to flood.....	65	96	136	125	222
Percent of replies received.....	19	17	20	20	18
Percent of affirmative replies.....	42	37	55	53	42
Of affirmative replies:					
(c) Interest dependent on cost.....	41	88	24	15	168
Percent of affirmative replies.....	27	34	36	32	32
(d) Interest in water damage but not flood.....	17	—	1	1	19
Percent of affirmative replies.....	11	—	14	2	—
(e) Interest depends on amount of deductible.....	3	—	—	—	3
Percent of affirmative replies.....	2	—	—	—	—
4. Possible interest replies.....	2	21	8	5	36
Percent of replies received.....	6	4	4	4	3
6. (a) Plants stating not subject to flood.....	264	163	145	95	667
Percent of replies received.....	78	29	80	78	55
(b) Plants stating are subject to flood.....	73	96	36	27	232
Percent of replies received.....	22	17	20	22	19

<sup>1</sup> Interpolation required to obtain.

TABLE 49.—*Flood damage questionnaire*—Continued

SUMMARY: BOSTON, MANUFACTURERS, BLACKSTONE, ARKWRIGHT—Continued

	Reported losses	Amount property insurance	Amount flood and water damage insur- ance desired
<b>7. Affirmative and possible interest replies classified:</b>			
(a) Plants not subject to flood:			
Boston.....	\$137, 150	\$182, 128, 000	\$91, 629, 000
Manufacturers.....	344, 214	676, 889, 530	530, 395, 530
Blackstone.....	1, 000	27, 270, 000	17, 520, 000
Arkwright.....	8, 750	54, 630, 750	7, 225, 000
Total.....	491, 114	940, 918, 280	646, 769, 530
(b) Plants are subject to flood:			
Boston.....	4, 700, 450	263, 361, 365	\$193, 391, 430
Manufacturers.....	4, 163, 054	972, 574, 437	512, 896, 350
Blackstone.....	275, 100	87, 806, 000	43, 426, 000
Arkwright.....	131, 720	73, 312, 600	11, 072, 900
Total.....	9, 270, 324	1, 397, 054, 402	760, 786, 680
Total (a) plus (b).....	9, 761, 438	2, 337, 972, 682	1, 407, 556, 210
(c) Interest dependent on cost (not in addition to above for Boston and Manufacturers):			
Boston.....	1, 364, 700	216, 209, 000	169, 854, 000
Manufacturers.....	285, 880	643, 681, 480	352, 152, 330
Blackstone.....	16, 500	75, 735, 000	68, 250, 000
Arkwright.....	56, 553	124, 740, 780	5, 667, 500
Total.....	1, 723, 633	1, 060, 366, 260	595, 923, 830
(c <sub>1</sub> ) Blackstone and Arkwright.....	73, 053	200, 475, 780	73, 917, 500
Total 7 (a) plus (b) plus (c <sub>1</sub> ).....	9, 834, 491	2, 538, 448, 462	1, 481, 473, 710
(d) Possibly interested:			
Boston.....	25, 050	3, 654, 000	2, 079, 000
Manufacturers.....	16, 056	54, 517, 650	24, 317, 650
Blackstone.....	1, 000	10, 282, 000	3, 625, 000
Arkwright.....	50, 500	16, 155, 000	800, 000
Total.....	92, 606	84, 608, 650	30, 821, 650
(d <sub>1</sub> ) Total Arkwright and Blackstone.....	51, 500	26, 437, 000	4, 425, 000
Total 7 (a) plus (b) plus (c <sub>1</sub> ) plus (d <sub>1</sub> ).....	9, 885, 991	2, 564, 885, 462	1, 485, 898, 710
(e) Interest in water damage only:			
Boston.....	30, 500	20, 815, 000	12, 489, 000
Manufacturers.....			
Blackstone.....	0	425, 000	300, 000
Arkwright.....	12, 500	536, 000	0
Total.....	43, 000	3, 776, 000	12, 789, 000
(e <sub>1</sub> ) Total Blackstone and Arkwright only.....	12, 500	961, 000	300, 000
Grand total 7 (a) plus (b) plus (c <sub>1</sub> ) plus (d <sub>1</sub> ) plus (e <sub>1</sub> ).....	9, 898, 491	2, 565, 846, 462	1, 486, 198, 710

This summary was the subject of comment by General Counsel Ambrose B. Kelly, of the associated companies in his October 4, 1955, letter to the staff of this committee. He wrote:

\* \* \* you will note that, despite the disasters and floods in the Middle West that year, a great majority of our policyholders did not feel that we should attempt to provide flood-insurance coverage. A somewhat similar survey is now being made by the Manufacturers Mutual, and we will be happy to provide your committee with the tabulation of the replies. From a rough check of the answers to date, it would seem that, despite the disasters of this year, the owners of property as a whole would still be reluctant to pay a substantial premium for such protection.

In his September 2, 1955, letter to his company's policyholders, President Hovey T. Freeman, of Manufacturers Mutual Fire Insurance Co., Providence, R. I., stated:

After every major flood catastrophe in this country the question arises, "Why isn't the risk of flood damage covered by insurance companies?" The answer is: It hasn't been because the total of losses from any one such flood can be of a catastrophic nature which would bankrupt the strongest insurance company. Another factor is that the insurance company would get an adverse selection against it. In other words, only those who had a flood hazard would insure their risk.

In 1952, following the disastrous floods of that year in the Midwest, the factory mutual companies circularized 25,000 of their fire-insurance policyholders in this country. A tabulation of the answers showed that less than 10 percent were interested in flood coverage and then only if the rate were low. An analysis of those who wanted the coverage showed that they were in areas which had been frequently flooded in the past. Because of this adverse selection, the rate that would have to be charged would necessarily have to be high and it was evident that the corporation policyholders whom we insured would rather take their flood losses as a deduction from their high Federal income taxes than to pay the annual large premium which would be involved. Therefore, because of this adverse situation and the lack of greater interest, the factory mutual companies decided to take no action in the matter.

Frequently one hears the question, "If the insurance companies were able to pay out several hundreds of million dollars for the 1954 hurricane losses, why couldn't they by themselves handle flood losses of the same magnitude?" The answer is that everybody is exposed to wind losses and as a result premiums have been collected over a period of years from millions of property owners, whereas in the case of flood damage only a few are interested in the coverage and then only at a price which would have been entirely inadequate.

But Mr. Freeman in his letter proceeds to outline a proposal for a Federal catastrophe reinsurance fund to be used to pay excess losses suffered by a ceding company in any one catastrophe in return for a premium to be paid by the ceding company and an agreement by that company to pay its indebtedness back to the fund in 5 or 10 years plus a loading for interest and expense. His plan would cover all types of risks including floods, war damage, and atomic radiation damage.

Following the 1952 studies by representative insurance groups, the entire industry apparently agreed with the conclusion that flood insurance did not provide an attractive commercial venture for profit-making purposes. No noticeable change has occurred since then in the private companies' disinclination to enter the insurance field generically described as flood risk on immovable property.

But in September 1955, the American Insurance Association, the successor organization to the Insurance Executives' Association that made the 1952 study of flood insurance, reconstituted its flood damage study group with Mr. J. V. Herd again named as chairman. That group is presently engaged in a new study of this entire problem. It has not yet announced any conclusions as a result of its fresh consideration of the matters involved. It is hoped the progress of this study may be outlined to the committee during its forthcoming public hearings.

#### GENERAL PROBLEMS

Among the problems for which the study group will want to seek answers are the following:

1. How broadly should "flood" be defined? Should it include only stream overflow, or that plus seepage from a general rise of water level, or those risks plus wind-driven tides, tidal wave and wave

wash, or all those plus high water from excessive rain in areas removed from streams or rivers and resulting mudflows? All these perils can cause damage. But the broader the definition the more complications are found. For example, properties subject to almost certain periodic loss would probably be offered for coverage. Actuarial rates might then be so high on specific properties as to discourage prospective purchasers.

2. Should high-risk areas be excluded completely from the program or insured only at very high premiums computed on an actuarial basis? If excluded, such areas are still without any source for insurance.

3. (a) How can the tendency toward adverse selection be overcome? If only those who are most exposed to flood risk purchase the insurance, the resulting premium tends to become prohibitive. Insuring 100 equally poor risks rather than 10 may prove to be a compounding, rather than a spreading, of the risk; especially if all are equally likely to suffer damage recoverable under the insurance policy.

(b) Will mortgagees tend to require such coverage if available? (c) In the case of federally insured or guaranteed mortgages, should mortgagees be compelled to arrange for such insurance coverage?

(d) How can past experience of private insurers with the difficulty of selling such insurance be overcome, where a limited market plus peak demand immediately after a flood, plus a tendency to lapse policies after floodless years in the particular area insured, combined to make the program unattractive to insurers?

4. (a) Are sufficient hydrological data available to form a forecast of flood frequency and intensity without unreasonable expense? (b) Is a detailed survey of each river and its reaches needed to obtain such data?

5. (a) Is a detailed survey and appraisal of each property to be insured necessary? Would the resulting cost be unreasonable? (b) In the alternative, can broad classifications of actual exposure to risk be made without property-by-property inspection?

6. Would the program be caught on the horns on the dilemma of actuarial premiums too high to be attractive or lower nonactuarial charges involving a probable subsidy with resulting loss to the insurer?

7. (a) In the absence of appropriate Federal legislation, would State supervisory officials permit issuance of a blanket natural disaster insurance policy by private insurers for a premium loaded for risks to which not all purchasers may be subject? (b) Would a prospective purchaser buy such a policy or insure separately the risks for which he wishes to be covered, unless the blanket policy is offered for a premium unrealistically low according to actuarial standards?

8. Would adding flood risk to extended coverage with an appropriate loading of the rate place private insurers that do so at a competitive disadvantage with those not including flood risk in extended coverage? Estimates on the basis of average annual flood losses of \$110 million indicate a required doubling of the extended coverage rate to carry such a plan into effect. If a \$500 million base is used instead of \$110 million the extended coverage rate would have to be almost quintupled.

9. Would a satisfactory spread of the risk be attained by offering group insurance to residents of a given public body in return for a

premium raised by the public body by taxation, special assessment, or otherwise?

10. (a) Is the catastrophic nature of insured losses controllable to such an extent as not to expose a private insurer to bankruptcy? Floods may and have hit in catastrophic proportions far above the average annual loss within a span of a few years. (b) Could this danger of catastrophic insurance claims be offset by appropriate Government reinsurance? (c) Is a plan feasible whereby the insurer assumes only an agreed portion of the middle risk on a given claim, the Government assuming both the lower and excess loss risks on such claim? (d) Is an alternate plan feasible whereby the Government would assume the risk of catastrophic excess loss of any given insurer in a single disaster on a portfolio basis, either with or without provisions for repayment of the excess loss to the Government by the insurer over a period of years?

11. (a) In order to reduce the rate otherwise needed to make an insurance program self-supporting, would it be practicable to offer an assured line of credit at private lending institutions to a potential flood victim in the event he becomes an actual flood victim, such loan to be guaranteed by the Government, with the purchaser paying a commitment fee commensurate with the risk involved? (b) Combined with actuarially computed insurance rates, would this offer a wider range of protection attractive to various economic groups at a lower cost than flood insurance alone?

12. (a) What can be done to overcome the practical danger that catastrophic insured losses will occur before the private insurer's reserves are built up through premiums and investment income thereon? (b) Would a Government reinsurance fund available to meet such a contingency answer the problem?

The Parsons engineering report outlined a method for estimating maximum probable flood loss for any one property. This figure might equal or be below the value of the property exposed to the risk, depending on its nature, location, and hydrological factors. This would be the minimum amount the insured should carry in order to collect any loss in full up to the limit of his policy. The engineering report also outlined a method for estimating the average annual loss for an individual property. This amount the insurer would have to charge merely to pay losses. To this an additional premium loading would be necessary to cover expenses. The average annual loss for an individual property plus the expense loading would be the premium an insurer would have to charge the insured for protection equal to his estimated maximum probable loss. The range of annual average loss on 54 properties surveyed at Lowell, Mass., was from 0.06 to 17.5 percent of maximum probable loss, and the overall annual average loss for these properties was 3.33 percent.

For example, assuming each of the 54 properties was worth \$10,000 and had a maximum probable loss of the same amount, average annual loss on the various properties would vary from \$6 to \$1,750, with an overall annual average of \$333.

The engineers' study indicated that had all 54 properties been insured for the required annual premium of \$127,584 (excluding expense loading), equal to 3.33 percent of maximum probable loss, the maximum probable losses on these properties would be more than

\$3,800,000. Therefore (ignoring investment income and salvage on one hand and expense loading on the other) 30 years would be needed to collect annual premiums enough to accumulate a fund equal to the maximum probable loss that might occur in any year and could occur several times within the 30-year period. The average annual premium for the 54 properties would amount to about \$2,362 per property, each property having an average value of \$70,370.

13. Can adequate insurance be made available by private insurers against the risks of damage caused by air pollution due to radioactive materials?

14. Are adequate insurance programs offered to cover the other types of natural hazards discussed in this study?

15. If private insurance programs are not to be offered against all these hazards, is a Government indemnity program feasible to supply that lack?

16. (a) What policy should be adopted for such a Government program to make it usable by those it is meant to benefit without involving unreasonable subsidy payments? (b) Should fees charged those benefiting from the program be fixed according to actuarial principles or made to meet the ability of those benefiting to pay? (c) Should they be uniform nationally or graded according to risk?

17. If such a program is placed in operation, would potential disaster victims not availing themselves of it have any persuasive basis on which to pursue a claim for gift relief from the Government in the event they become actual victims of disaster?

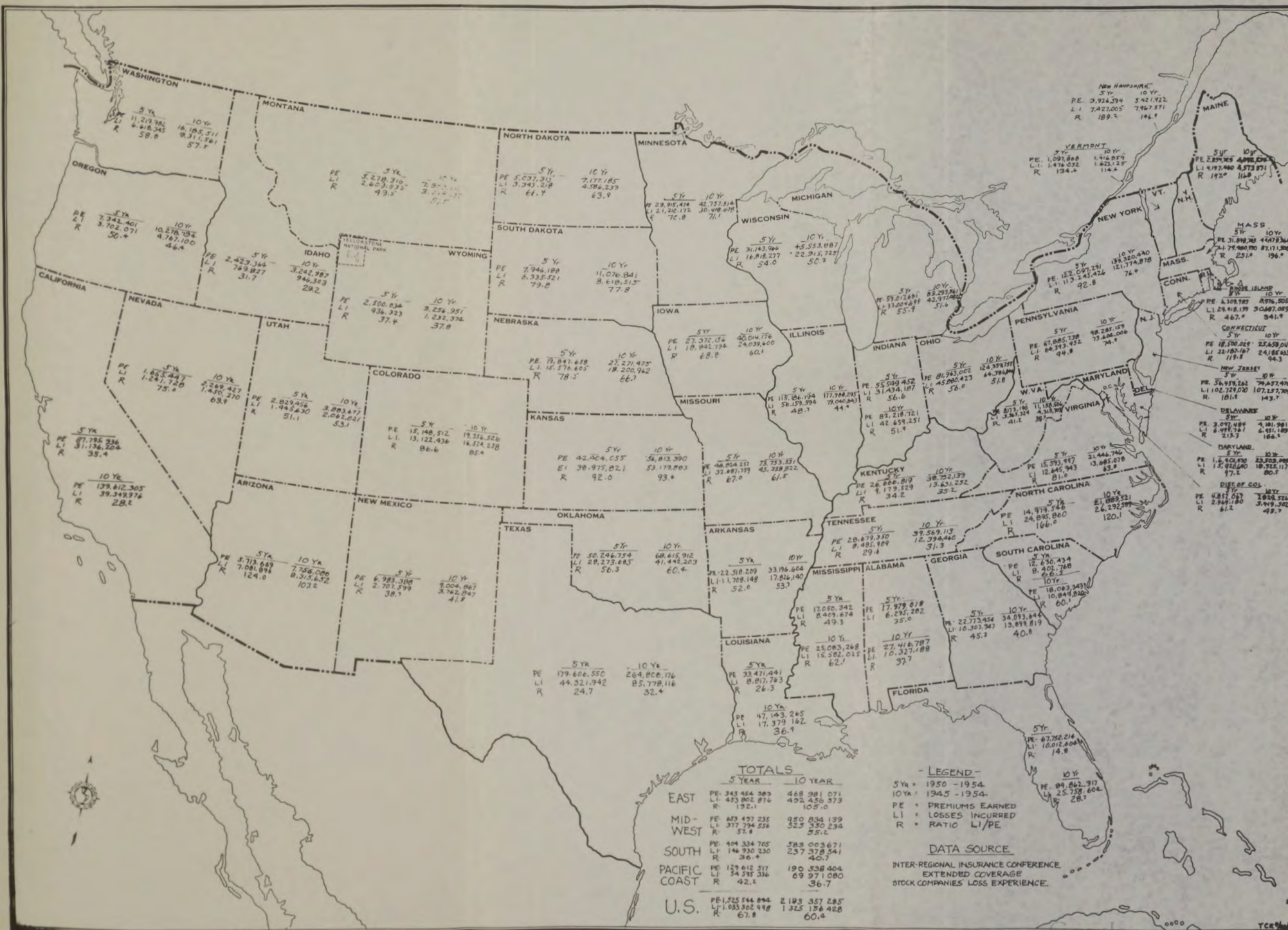
#### LOSS EXPERIENCE

Previous mention has been made of the fact that in certain limited fields of insurance, flood risks are covered by private insurers. Following the 1951 Kansas and Missouri floods, an estimate was made that of total flood damage amounting to more than \$1 billion, only \$25 million to \$50 million worth was covered by insurance, according to Samuel M. Roberts, director of the Research and Budget Department of Kansas City, Mo. This represented a coverage of not more than 5 percent of total flood loss.

Although there is no classification of the particular peril on account of which payment of loss was made, figure 26 sets forth loss data by States for capital stock insurance companies for both the 5-year and the 10-year period ending with 1954, incurred under "Extended coverage." Perils covered include windstorm, hail, explosion, riot, riot attending a strike, civil commotion, aircraft, vehicles, and smoke.

Excluded are losses under "Comprehensive automobile policies" or "Inland marine contracts," such as personal-property floaters, garment contractors' floaters, and bailees' contracts. Chairman J. V. Herd, of the American Insurance Association's committee to study floods and flood damage, states that under each type of such excluded cover, windstorm, water, and flood, experience has been costly to all insurance companies.

Statistics included in the foregoing figure 26 show by States the amount of premiums earned, the amount of losses incurred, and the ratio of losses incurred to premiums earned. They indicate an unprofitable loss ratio of 132.1 over a 5-year term and 105 over a 10-year term in the eastern United States; and an overall United States aver-





age loss ratio of 67.8 for the 5-year term and 60.4 for the 10-year term. The loss ratio of 467 for the 5-year term and 341.9 for the 10-year term in Rhode Island is particularly heavy. Loss ratios such as these have necessitated increases in premium rates for extended coverage in the East in recent years. It has been stated that this required increase was accompanied by a tendency of policyholders not to renew extended coverage. Similar statistics on a State-by-State basis have not yet been compiled for the year 1955. However, they will include serious hurricanes and windstorms in Texas, Oklahoma, Kansas, Ohio, and New Jersey. It is interesting, if significant, that the windstorms loss for 1955 apparently will hit hardest in States not usually associated in the mind of the public with the recent disastrous floods accompanying hurricane Diane and the October severe storm in the East. Only the wind damage, as distinguished from water damage, from a hurricane is covered under the standard extended coverage in use on residential and commercial properties in New England and the Middle Atlantic States. This form of extended coverage is shown in appendix A, page 247.

The 1954 Annual Report of the Factory Mutual Engineering Division of the Associated Factory Mutual Fire Insurance Companies notes that on about \$55.2 billion of net insurance in force, its 10-year loss amounted to an annual average of \$11.9 million, equivalent to a net loss percentage of net insurance in force of 3.53 percent.

For the year 1954, net losses amounted to an estimated \$19,267,000, a net loss percentage of 3.62 per dollar insured, about the same as for the year 1953. Table 50 indicates in detail the number of claims and amounts of loss by types of coverage.

TABLE 50. *Net losses 1954—Partly estimated as of Dec. 19, 1954*

Type	Number of claims	Loss amount
Fire.....	3,934	\$7,226,000
Explosion.....	191	658,000
Lightning.....	475	282,000
Leakage.....	554	807,000
Windstorm.....	3,472	7,366,000
Vehicle.....	196	44,000
Riot and commotion.....	370	127,000
Use and occupancy.....	600	2,777,000
Total.....	9,792	19,267,000

Almost half the 1954 loss was due to hurricanes, as noted in table 51.

TABLE 51. *Hurricane losses in 1954*

Designation	Number of claims	Loss amount
Carol.....	807	\$4,883,000
Edna.....	394	651,000
Hazel.....	1,105	1,794,000
Total.....	2,306	7,328,000

The largest individual loss among these amounted to about \$1 million. This occurred at a plant where a large unanchored roof was lifted. The annual report commented that lack of anchorage was also responsible for other large losses. In striking contrast, plants with anchored roofs came through with roofs undamaged, even though subjected to the maximum wind forces. By comparison, the outstanding single fire loss amounted to well over \$1 million, occurring in a southern bleachery.

In its 1954 annual report, the Manufacturers Mutual Fire Insurance Co., of Providence, R. I. (one of the six members of the factory mutual group), noted a total net loss of \$6,131,626 incurred during that year, as compared with almost \$15.2 billion of insurance in force. This amounted to a loss ratio of 4.11 cents per \$100 of insurance in force. Table 52 contains a summary of these losses.

TABLE 52. *Summary of losses incurred during 1954*

Class of loss	Number of losses incurred	Number of losses incurred by our company	Net loss incurred by our company	Average loss per claim to our company
Fire.....	4,375	3,361	\$2,927,070	\$871
Sprinkler leakage.....	531	520	222,684	428
Wind.....	3,458	2,903	2,006,815	691
Explosion.....	189	157	164,197	1,046
Earthquake.....	1	1	1,532	1,532
Aircraft and other vehicles.....	195	134	17,129	128
Riot and civil commotion.....	365	263	32,360	123
Use and occupancy losses due to—				
Fire.....	421	316	363,895	1,152
Sprinkler leakage.....	25	15	13,235	882
Wind.....	124	113	238,663	2,112
Explosion.....	27	14	141,830	10,131
Earthquake.....	1	1	135	135
Aircraft and other vehicles.....	4	4	1,367	342
Riot and civil commotion.....	1	1	714	714
Total losses, year 1954.....	9,717	7,803	6,131,626	786

Again in the case of this company, the three hurricanes mentioned above added materially to the loss for the year. The company noted, however, that losses were not large enough to bring into action the excess catastrophe reinsurance contracts carried with London Lloyd's and American Mutual Reinsurance Co. of Chicago. The latter is a company organized several years ago by the Factory Mutual Companies to provide reinsurance facilities in the United States for mutual fire and casualty insurance companies, lessening dependence on the foreign reinsurance market.

Manufacturers Mutual, on the other hand, was called upon to reimburse some mutual insurance companies outside the Factory Mutual Companies to the extent of \$539,391.26 for catastrophe losses in which it took part through the American Mutual Reinsurance Co.

Manufacturers Mutual most serious windstorm loss of the year was its 29 percent participation in a loss over \$1 million due to the wind's lifting a considerable section of unanchored roof on a textile plant in Fall River, Mass., during Hurricane Carol.

It is interesting to note in passing that the company's most serious explosion loss took place in a pharmaceutical plant due to excessive pressure resulting from an uncontrolled chemical reaction. The ex-

plosion seriously damaged the precast concrete roof slabs and surrounding equipment. Property damage loss of \$125,000 was estimated and use and occupancy loss of \$750,000. The company's share was 7½ percent.

During the year 1954 the company had one earthquake claim resulting in loss to it of \$1,532. It is estimated by the United States Coast and Geodetic Survey that about \$1 billion of earthquake insurance is presently in force in California.

Within the past week (October 9-16, 1955) it has been announced that insurance coverage against war damage will be issued by private insurers on the foundations of the Mackinac Straits Bridge in Michigan, with plans to provide similar insurance for the bridge superstructure due for completion about 1957.

Before concluding this portion of the study, it should be noted that private insurers note that in some instances they offer insurance coverage that is not, however, purchased by potential buyers. One example of this exists in the case of third party liability coverage relating to motor vehicles, where for a very few additional dollars of premium, the insured can obtain a great increase in the maximum dollar coverage.

#### APPENDIX A

##### STANDARD EXTENDED COVERAGE FORM FOR INSURANCE ISSUED IN NEW ENGLAND AND MIDDLE ATLANTIC STATES

Uniform Standard New England

Form No. 758  
(6-55)

##### EXTENDED COVERAGE ENDORSEMENT NO. 4

(PERILS OF WINDSTORM, HAIL, EXPLOSION, RIOT, RIOT ATTENDING A STRIKE, CIVIL COMMOTION, AIRCRAFT, VEHICLES, SMOKE, EXCEPT AS HEREINAFTER PROVIDED)

(FOR USE IN MAINE, VERMONT, MASSACHUSETTS, RHODE ISLAND AND CONNECTICUT)

Attached to and forming part of Policy No.-----

of the-----  
[Name of insurance company]

issued at its----- Agency

Dated----- 19-- Agent

Rate for extended coverage-----

Applies to Item (s)-----

In consideration of \$----- premium, and subject to provisions and stipulations (hereinafter referred to as "provisions") herein and in the policy to which this endorsement is attached, including riders and endorsements thereon, the coverage of this policy is extended to include direct loss by Windstorm, Hail, Explosion, Riot, Riot Attending a Strike, Civil Commotion, Aircraft, Vehicles, and Smoke.

This endorsement does not increase the amount or amounts of insurance provided in the policy to which it is attached.

If this policy covers on two or more items, the provisions of this endorsement shall apply to each item separately.

Substitution of Terms: In the application of the provisions of this policy, including riders and endorsements (but not this endorsement), to the perils covered by this Extended Coverage Endorsement, wherever the word "fire" appears there shall be substituted therefor the peril involved or the loss caused thereby, as the case requires.

Apportionment Clause: This Company shall not be liable for a greater proportion of any loss from any peril or perils included in this endorsement than (1) the amount of insurance under this policy bears to the whole amount of fire

insurance covering the property, whether collectible or not, and whether or not such other fire insurance covers against the additional peril or perils insured hereunder; (2) nor for a greater proportion than the amount hereby insured bears to all insurance, whether collectible or not, covering in any manner such loss; except if any type of insurance other than fire with extended coverage or windstorm insurance applies to any loss to which this insurance also applies, the limit of liability of each type of insurance for such loss, hereby designated as "joint loss," shall first be determined as if it were the only insurance, and this type of insurance shall be liable for no greater proportion of joint loss than the limit of its liability for such loss bears to the sum of all such limits. The liability of this Company (under this endorsement) for such joint loss shall be limited to its proportionate part of the aggregate limit of this and all other insurance of the same type.

The words "joint loss" as used in the foregoing, mean that portion of the loss in excess of the highest deductible, if any, to which this endorsement and other types of insurance above referred to both apply.

**War Risk Exclusion Clause:** This Company shall not be liable for loss caused directly or indirectly by (a) hostile or warlike action in time of peace or war, including action in hindering, combating or defending against an actual, impending or expected attack, (1) by any government or sovereign power (*de jure* or *de facto*), or by any authority maintaining or using military, naval or air forces; or (2) by military, naval or air forces; or (3) by an agent of any such government, power, authority or forces, it being understood that any discharge, explosion or use of any weapon of war employing atomic fission or radioactive force shall be conclusively presumed to be such a hostile or warlike action by such a government, power, authority or forces; (b) insurrection, rebellion, revolution, civil war, usurped power, or action taken by governmental authority in hindering, combating or defending against such an occurrence.

**Waiver of Policy Provisions:** A claim for loss from perils included in this endorsement shall not be barred because of change of occupancy, nor because of vacancy or unoccupancy.

**Loss Deductible Clause:** (Applicable in Maine and Mandatory in Vermont, Massachusetts, Rhode Island and Connecticut.) It is a condition of this Extended Coverage Endorsement, that, in accordance with the provisions hereinafter contained, the sum of Fifty Dollars (\$50.00) shall be deducted from the amount of loss resulting from each windstorm or hailstorm. This condition shall apply separately to each building or structure and separately to personal property in the open but not to contents contained in any building described herein.

This Company shall be liable for its proportion of the loss in excess of Fifty Dollars (\$50.00) deducted in accordance with the apportionment provisions of this Extended Coverage Endorsement.

For the purpose of this Loss Deductible Clause, antennas or aerials including their masts and towers are considered as being personal property in the open or a part of the building or structure.

*The conditions and provisions printed on the back of this form are hereby referred to and made a part hereof.*

#### CAUTION

*When this endorsement is attached to one fire policy, the insured should secure like coverage on all fire policies covering the same property.*

Conditions and Provisions referred to in and made a part of this form (No. 758), (6-55)

**Provisions Applicable Only to Windstorm and Hail:** This Company shall not be liable for loss caused directly or indirectly by (a) frost or cold weather or (b) ice (other than hail), snowstorm, sleet, waves, tidal wave, high water or overflow, whether driven by wind or not.

This Company shall not be liable for loss to the interior of the building or the property covered therein caused, (a) by water, rain, snow, sand or dust, whether driven by wind or not, unless the building covered or containing the property covered shall first sustain an actual damage to roof or walls by the direct force of wind or hail and then shall be liable for loss to the interior of the building or the property covered therein as may be caused by water, rain, snow, sand or dust entering the building through openings in the roof or walls made by direct

action of wind or hail or (b) by water from sprinkler equipment or other piping, unless such equipment or piping be damaged as a direct result of wind or hail.

Unless liability therefor is specifically assumed by endorsement to this Extended Coverage Endorsement, this Company shall not be liable for damage to the following property: (a) Grain, hay, straw, or other crops outside of buildings or (b) windmills, windpumps or their towers, or (c) crop silos (or their contents).

**Provisions Applicable Only to Explosion:** Loss by explosion shall include direct loss resulting from the explosion of accumulated gases or unconsumed fuel within the firebox (or the combustion chamber) of any fired vessel or within the flues or passages which conduct the gases of combustion therefrom but this Company shall not be liable for loss by explosion, rupture or bursting of steam boilers, steam pipes, steam turbines, steam engines or rotating parts of machines or machinery, owned, operated or controlled by the Insured or located in the building(s) described in this policy.

Electrical arcing, water hammer, and the bursting of water pipes are not explosions within the intent or meaning of these provisions.

Any other explosion clause made a part of this policy is superseded by this endorsement.

**Provisions Applicable Only to Riot, Riot Attending a Strike and Civil Commotion:** Loss by riot, riot attending a strike or civil commotion shall include direct loss by acts of striking employees of the owner or tenant(s) of the described building(s) while occupied by said striking employees and shall also include direct loss from pillage and looting occurring during and at the immediate place of a riot, riot attending a strike or civil commotion. Unless specifically endorsed hereon in writing this Company shall not be liable, however, for loss resulting from damage to or destruction of the described property owing to change in temperature or interruption of operations, whether or not such loss is covered by this policy as to other perils.

**Provisions Applicable Only to Loss by Aircraft and Vehicles:** The term "vehicles," as used in this endorsement, means vehicles running on land or tracks but not aircraft. Loss by aircraft or by vehicles shall include only direct loss resulting from actual physical contact of an aircraft or a vehicle with the property covered hereunder or with the building containing the property covered hereunder, except that loss by aircraft includes direct loss by objects falling therefrom. This Company shall not be liable, however, for loss (a) by any vehicle owned or operated by the Insured or by any tenant of the described premises; (b) by any vehicle to fences, driveways, walks or lawns; (c) to any aircraft or vehicle including contents thereof other than stocks of aircraft or vehicles in process of manufacture or for sale.

**Provisions Applicable Only to Smoke:** The term "smoke" as used in this endorsement means only smoke due to a sudden, unusual and faulty operation of any heating or cooking unit, only when such unit is connected to a chimney by a smoke pipe or by a vent, and while in or on the premises described in this policy, excluding, however, smoke from fireplaces or industrial apparatus.

**Provisions Applicable Only when the Endorsement is attached to a Policy Covering Business Interruption, Extra Expense, Additional Living Expense, Rents, Leasehold Interest, Tuition Fees, Profits and Commissions, or Consequential Loss:** When this endorsement is attached to a policy covering Business Interruption, Extra Expense, Additional Living Expense, Rents, Leasehold Interest, Tuition Fees, Profits and Commissions, or Consequential Loss, the term "direct," as applied to loss, means loss, as limited and conditioned in such policy, resulting from direct loss to described property from perils insured against; and, while the business of the owner or tenant(s) of the described building(s) is interrupted by a strike at the described location, this Company shall not be liable for any loss owing to interference by any person(s) with rebuilding, repairing or replacing the property damaged or destroyed or with the resumption or continuation of business.

The provisions of the Loss Deductible Clause, if any, contained in this endorsement do not apply to insurance covering Business Interruption, Tuition Fees, Extra Expense, Additional Living Expense, Rents, Leasehold Interest, Profits and Commissions or Errors and Omissions.



## X. BACKGROUND CONSIDERATIONS FOR FEDERAL PARTICIPATION IN DISASTER INSURANCE

Natural disasters respect no State or local boundary lines. As can be seen by a glance at figure 1 they occur at widespread points throughout the Nation.

They often impede commerce among the several States and with foreign nations. They damage post offices and post roads. At times they interfere with the common defense and general welfare of the United States, and the collection of taxes, duties, imposts, and excises. They plague and discomfort disaster victims in their dual capacity as citizens of the United States as well as citizens of the State wherein they reside, in cases where they are either.

Under the 1936 Flood Control Act (49 Stat. 1570), approved June 22, 1936, the Congress set forth the following declaration of policy:

It is recognized that destructive floods upon the rivers of the United States, upsetting orderly processes and causing loss of life and property, including the erosion of lands, and impairing and obstructing navigation, highways, railroads, and other channels of commerce between the States, constitute a menace to national welfare; that it is the sense of Congress that flood control on navigable waters or their tributaries is a proper activity of the Federal Government in cooperation with States, their political subdivisions, and localities thereof; that investigations and improvements of rivers and other waterways, including watersheds thereof, for flood-control purposes are in the interest of the general welfare; that the Federal Government should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected.

On the basis of this policy, the Congress authorized a program of physical protective works as a measure of flood control in order to control destructive floods that menace national welfare. It would seem that a Federal insurance or indemnity program of the general type under discussion would be but another means of minimizing or avoiding the menace to national welfare caused by destructive floods.

The Congress has already enacted into law several programs incorporating the insurance method or a related indemnity method with the payment of fees or charges. These include such programs as—

1. Crop insurance;
2. Bank deposit insurance;
3. Savings and loan account insurance;
4. Housing mortgage insurance (FHA and VA);
5. Maritime vessel mortgage insurance;
6. Maritime cargo wartime insurance;
7. Aviation wartime insurance;
8. Veterans' life insurance;
9. Unemployment insurance;
10. Old-age and survivors' insurance;
11. Government employees' insurance;
12. Export-Import Bank tangible property insurance;

13. Mutual Security Act investment guaranty program;
14. V-loans guaranteed by Federal Government agencies; and
15. War damage insurance.

It can be readily seen that the insurance device has already gained wide use in Federal programs. Several of these programs were inaugurated by Federal legislation at a time when persons active in private business cast strong doubts on their workability; but, as operating experience progressed, the confidence of private businessmen in the programs grew so that now many of them have become part and parcel of everyday business transactions stoutly defended by some of the same groups that were first hesitant about their practicality.

#### FEDERAL CROP INSURANCE

Because it is a fairly recent development in a field to which it seemed difficult to apply insurance principles, the present Federal crop insurance program is discussed in appendix A, page 272, in some detail. It has suffered from the damaging effects of natural disasters such as drought and hurricane. Administered by the Federal Crop Insurance Corporation in the United States Department of Agriculture, it has experienced **growing pains**. The problems it has met may well serve as markers for problems of a similar nature that may arise in the operation of a Federal disaster insurance or indemnity program.

#### WAR DAMAGE CORPORATION

Another Federal insurance program that could serve as a guide-post in considering the feasibility of a Federal disaster-loan program is that administered by the War Damage Corporation. In the field of war-damage legislation, this is an obvious precedent. It also encountered many problems of interest in the administration of an insurance or indemnity program relating to natural disasters.

This Corporation was originally chartered by the Reconstruction Finance Corporation on December 13, 1941, under authority of section 5d of the Reconstruction Finance Corporation Act. Its original name was the War Insurance Corporation, later changed to War Damage Corporation on March 30, 1942. The charter purposes of the Corporation were "to provide, through insurance, reinsurance, or otherwise, reasonable protection against loss of or damage to property, real and personal, which may result from enemy attack." By amendment of March 30, 1942, the charter was altered to include expressly within the meaning of "enemy attack" any action taken by the military, naval, or air forces of the United States in resisting enemy attack. On the same date, the charter was amended to confer expressly on the Corporation power to establish rates and terms and conditions upon which protection under the charter would be made available.

The original charter authorized the Corporation to sue or be sued in any court of competent jurisdiction. The most recent charter amendment occurred on January 15, 1947. This changed paragraph "Seventh," dealing with the life of the Corporation, to read as follows:

Seventh. The Corporation shall not have succession beyond January 22, 1947, except for purposes of liquidation, including the adjustment and payment, not

later than June 30, 1947, of claims duly presented under subsection (b) of section 5g of the Reconstruction Finance Corporation Act, as amended.

That apparently remains the status of War Damage Corporation to date—a Corporation without operating authority but existing for liquidation only. A suit pending in an Indiana State court seeking recovery of premiums has kept the Corporation from completing its liquidation.

WDC was originally created with a capitalization of \$100 million (of which \$1 million was paid in immediately) to be held by RFC. By act of March 27, 1942 (56 Stat. 174), RFC was authorized to continue to supply funds to WDC, the statute authorizing an increase in RFC notes and other obligations to supply an aggregate of not more than \$1 billion on request of the Secretary of Commerce with the President's approval. This act authorized RFC to empower WDC to use its funds "to provide, through insurance, reinsurance, or otherwise, reasonable protection against loss of or damage to property, real and personal, which may result from enemy attack (including any action taken by the military, naval, or air forces of the United States in resisting enemy attack), with such general exceptions as the War Damage Corporation, with the approval of the Secretary of Commerce, may deem advisable." The act of March 27, 1942, contained the following additional provisions pertinent to War Damage Corporation:

Such protection shall be made available through the War Damage Corporation on and after a date to be determined and published by the Secretary of Commerce which shall not be later than July 1, 1942, upon the payment of such premium or other charge, and subject to such terms and conditions, as the War Damage Corporation, with the approval of the Secretary of Commerce, may establish, but, in view of the national interest involved, the War Damage Corporation shall from time to time establish uniform rates for each type of property with respect to which such protection is made available, and, in order to establish a basis for such rates, such Corporation shall estimate the average risk of loss on all property of such type in the United States. Such protection shall be applicable only (1) to such property situated in the United States (including the several States and the District of Columbia), the Philippine Islands, the Canal Zone, the Territories and possessions of the United States, and in such other places as may be determined by the President to be under the dominion and control of the United States, (2) to such property in transit between any points located in any of the foregoing, and (3) to all bridges between the United States and Canada and between the United States and Mexico: *Provided*, That such protection shall not be applicable after the date determined by the Secretary of Commerce under this subsection to property in transit upon which the United States Maritime Commission is authorized to provide marine war-risk insurance. The War Damage Corporation, with the approval of the Secretary of Commerce, may suspend, restrict, or otherwise limit such protection in any area to the extent that it may determine to be necessary or advisable in consideration of the loss of control over such area by the United States making it impossible or impracticable to provide such protection in such area.

(b) Subject to the authorizations and limitations prescribed in subsection (a) of this section, any loss or damage to any such property sustained subsequent to December 6, 1941, and prior to the date determined by the Secretary of Commerce under subsection (a) of this section, may be compensated by the War Damage Corporation without requiring a contract of insurance or the payment of premium or other charge, and such loss or damage may be adjusted as if a policy covering such property was in fact in force at the time of such loss or damage.

It is interesting to note that WDC honored and paid out many claims under this so-called free insurance that antedated the WDC premium-collection program. It is roughly estimated claims so paid

ran from 50 to 75 percent of the total of \$1.2 million claims paid by WDC during its operating existence.

By way of comparison, total premiums collected by WDC amounted to about \$250 million. Total operating expense was around \$39 million, leaving a net operating profit of about \$210 million. Of this, private insurance companies participating as underwriters received about \$21 million, in accordance with participation agreements with WDC whereby the companies were to share in net income or deficit to the extent of 10 percent. The form of such participation agreement is set forth in appendix B, page 299.

The War Damage Corporation regulations, rules, and rates effective July 1, 1942, as amended, are set forth in appendix C, page 304.

War Damage Corporation is of prime interest in connection with the discussion of a Federal disaster insurance or indemnity program because of the types of insurance it offered and the operating methods it employed. That the Corporation's net income proved to be as great as it did is more attributable to the watchfulness of Providence in preventing catastrophic war losses on United States territory than to the inherent attractiveness of the program from an insurance standpoint. No private insurer has ventured to enter the general field of insuring property against war risks after WDC ceased its operating functions.

The May 1952 Report on Floods and Flood Damage issued by the Insurance Executive Association alluded to the unattractiveness of war risks as subjects of commercial insurance as follows:

To the experienced insurance mind, the flood peril presents the same sort of unpredictable widespread devastation and destruction that we associate with modern war damage, and the same considerations which prompted the business of insurance to refrain from assuming liability for war damage to property on land during World War II.

Nevertheless, the private insurance business did make its facilities available willingly to assist the War Damage Corporation in carrying out the Government war-damage-insurance program at a reasonable cost.

The War Damage Corporation could lean on the strong footing of the war power for the constitutionality of its existence, wholly apart from whatever additional constitutional bases it may have had.

#### HISTORY OF LEGISLATIVE PROPOSALS RELATING TO FEDERAL DISASTER INSURANCE

On August 20, 1951, following the disastrous floods in the Midwest with property loss estimated at more than \$1 billion and income loss estimated at an equal amount, on the basis of preliminary estimates, President Truman sent to the Congress a special message (H. Doc. No. 228, 82d Cong., 1st sess.) requesting a \$400 million appropriation for a 5-point general Federal flood-relief plan. As part of this program, he recommended that \$50 million of the \$400 million requested, be set aside in a revolving fund for the financing of a Federal flood-insurance program. The remaining 4 points covered partial personal indemnity, direct and guaranteed loans for homes and businesses, farmland and building aid, and loans to aid State and local government participation. Congressman Bolling, of Missouri, introduced a bill in the House of Representatives intended to achieve the purposes

of the President's recommendations. The President's message, which was referred to the congressional committees on appropriations, appears in appendix D, page 371.

Hearings on this matter were held on September 19, 20, 21, 25, and 26, 1951, before a subcommittee of the House Committee on Appropriations over which Congressman Norrell, of Arkansas, presided as chairman. In testimony before the subcommittee, Mr. A. E. Howse, personal representative of the Director, Office of Defense Mobilization, stated that the \$50 million to be placed in a revolving fund to finance a Federal flood-insurance program, together with the remainder of the flood-relief program, was intended to be administered by a Flood Disaster Administration, to be established by the President as a small policymaking body of some 30 employees. The actual operations were to be carried out by existing agencies in the executive branch, such as the Housing and Home Finance Agency, RFC, and the Department of Agriculture.

Housing and Home Finance Administrator Raymond M. Foley testified that the amount of exposure of the Federal Housing Administration's mortgage funds in this very large disaster was remarkably limited—466 dwellings with about \$500,000 estimated damage out of so many thousands of homes that were affected. He noted the Veterans' Administration was somewhat more affected—700 homes with estimated damage of less than \$2 million.

The President's message had noted an estimated 30,000 to 40,000 homes flooded and of these, 10,000 to 15,000 were destroyed or suffered major damage.

Hon. Albert M. Cole, then a Representative in Congress from the State of Kansas and presently Housing and Home Finance Administrator, supported both the flood insurance and private indemnity portions of the President's recommendations.

Testifying that he doubted workability of a Federal flood insurance program required to be self-supporting, Mr. J. R. Berry, general counsel of the National Board of Fire Underwriters, estimated that the net worth of all property insurance companies at that time was roughly \$2 billion—possibly somewhat higher.

Mr. J. V. Herd, executive vice president of the America Fore Insurance Group of New York City, noted that in 1944 for the last time preceding his testimony, a representative committee of the insurance industry and competent engineers made a study, on the basis of which the insurance committee concluded insurance coverage against flood damage was not feasible or practicable. He noted adverse selection and prohibitive premium rates as the two main reasons for nonfeasibility of commercial flood insurance. Adding to Mr. Berry's estimates of net free assets of stock property insurance companies as over \$2 billion (Mr. Herd noted the figure as about \$2½ billion as of the end of 1950), he further noted that the net free assets of all property insurance companies doing business in the United States, including stock, mutual, and reciprocal companies—was then just in excess of \$3 billion. As an example of the companies' exposure to risk, he noted that the November 25, 1950, severe windstorm affecting 11 States cost insurance companies over \$200 million in claims paid. In reply to a question, he estimated fire-insurance premiums collected by fire or property-insurance companies at \$1¼ billion an-

nually, and an added equal amount to these companies from miscellaneous sources, making a total of about \$2½ billion annually in premiums collected by such insurance companies. Doubting the feasibility of a Federal flood insurance program, he nevertheless expressed the opinion the insurance industry would offer its services in helping carry out an indemnity program if the Federal Government decided to adopt one. He also noted that as chairman of a then 3-week-old special committee of the Insurance Executives Association formed to study flood insurance, he was still involved in the study. Both he and Mr. Berry recommended against using the word "insurance" to describe the Federal "insurance" program under discussion before the committee, because it is not generically insurance in theory nor would it be likely to prove to be insurance in practice.

In the House Committee on Appropriation's report filed by Representative Norrell on October 3, 1951, to accompany House Joint Resolution 341 (H. Rept. No. 1092), the difficulties in arranging a workable Federal flood insurance program were reviewed. This part of the report reads as follows:

#### FLOOD INSURANCE

The third part of the budget request contemplates the establishment of a Government administered nationwide flood insurance program for which an initial appropriation of \$50 million was requested.

The committee has considered this proposal in unusual detail because of the far-reaching effects, financial and otherwise, which could result from the inauguration of such a program. In testifying in support of this request, Colonel Howse admitted that no definite plans of any kind had been formulated, although he stated the matter was being investigated by the insurance companies.

In order to obtain first-hand and complete information on the subject, the committee devoted the last day of its hearings to a discussion of the flood-insurance proposal with the general counsel of the National Board of Fire Underwriters and the executive vice president of the America Fore Insurance Group of New York who is also chairman of a special committee of the Insurance Executives Association formed to study the problem of flood insurance or flood-damage coverage.

In their testimony these witnesses discussed the following problems and difficulties which the committee is convinced must be resolved before any flood-insurance program such as is proposed here could be carried out successfully.

Property insurance of any kind is based upon the principle that the contributions of the many take care of the losses of the few. The reason why insurance companies have not been able to write insurance to protect property owners from flood damage throughout the country is that experience has indicated that flood insurance is sought only by those who are exposed to floods. Consequently, it is not possible to spread the risk sufficiently to avoid such high premiums, if the program is to be self-sustaining, that a property owner in the "danger area" would prefer to take his own risk.

The average annual losses from flood damage in the United States have been estimated anywhere from one hundred to five hundred million dollars, depending upon the definition of "flood damage." The estimated property loss in the Kansas-Missouri flood is \$2½ billion or about equal to the total value of the free assets of the stock insurance companies which write property insurance in this country. Losses of these proportions immediately raise the question of the adequacy of the \$50 million requested—or even \$500 million.

When asked what the results would be if the Federal Government were to require insurance companies to include flood coverage with other types of insurance, one of the witnesses pointed out that there are about 3,600 mutual insurance companies in the United States that confine themselves to intrastate business, and that these companies would write flood insurance only in those areas where there is a demand for such coverage. He stated further that, were the large stock companies which write insurance on a nationwide basis required to write flood insurance, their rates would be loaded to the extent that they would be priced out of the market entirely whenever they came into competition

with these small mutual companies, with the result that such a requirement would upset the entire insurance business industry.

The committee included no recommendation for any of the \$50 million flood insurance appropriation requested by the administration.

Senate Appropriations Committee hearings on this same flood-relief request were held with reference to House Joint Resolution 341 on October 10, 1951. With regard to the flood-insurance program recommended by President Truman, testimony was similar to that given to the House Appropriations Subcommittee. Senator Schoeppel, of Kansas, testified that he felt a definite, positive need for flood insurance comprehensive enough to encompass the entire country, realizing that many technical and complicated details require solution. Housing and Home Finance Administrator Foley in response to questioning from Senator Ferguson, noted that under ordinary State laws, a deficit liability remained in force against a homeowner whose home is destroyed while an unpaid mortgage is outstanding for which the home formed part of the security.

In its Senate Report No. 961 filed by Senator McKellar on October 16, 1951, to accompany House Joint Resolution 341, the committee noted briefly:

With respect to the indemnification provision and national system of flood-disaster insurance, as well as the creation of a Flood Disaster Administration, it is the consensus of opinion of the members of the committee that these are matters which call for substantive legislation and should be considered by the proper legislative committees.

Earlier, legislation for Federal indemnity for flood property loss had been introduced by Senator Hennings and Congressman Bolling. Moreover, on September 20, 1951, Senator Carlson, of Kansas, introduced for himself, Senator Schoeppel, of Kansas, and Senator Kem, of Missouri, a bill (S. 2148) to establish a National Disaster Insurance Corporation. To be known as the National Disaster Insurance Corporation Act of 1951, this bill basically would have authorized a Federal Government reinsurance program for insurance by insurance companies against loss or damage caused by flood, tidal wave, earthquake, or hurricane to privately or State or local government-owned real or personal property. The reinsured insurance would have covered only loss or damage occurring within the United States or its Territories. Reinsurance would have been made available only where insurance of the type described would have been otherwise unavailable. The Corporation would have been given general corporate powers, including the right to sue and be sued in any State or Federal court of competent jurisdiction. Its management would have been vested in a Board of Directors, consisting of 3 persons to be appointed by the President, subject to confirmation by the Senate, for overlapping terms of 6 years. No more than two of the Board members could have been members of the same political party. The President would have designated one of the Board members as Chairman. An advisory committee of not more than five members experienced in writing fire and casualty insurance could have been appointed by the Board to advise the Corporation concerning execution of its functions.

The Corporation would have had a capital structure consisting of \$50 million of capital stock subscribed by the United States. An appropriation in a like amount was authorized to enable the Secretary of the Treasury to purchase the stock. Proceeds of the sale of stock

would have been placed in a National Disaster Insurance Fund the bill would have established in the United States Treasury. Reinsurance premiums would have been similarly deposited. Interest earned on investment of money in the fund in United States obligations would have augmented it. The fund could have been used to create reserves required under accepted actuarial principles, and to pay reinsurance liabilities. Administrative expenses would have been borne by the Government out of sums authorized to be appropriated. Its operations would have been made subject to the Government Corporation Control Act.

Reinsurance premium rates would have been fixed by the Corporation upon consideration of the risks involved and the desirability of providing insurance protection not otherwise available. Corporate regulations would have governed the types of property reinsured, the nature and limits of reinsured loss or damage, and other matters necessary to carry out the act's purposes.

Reinsurance could have been provided only to the extent not otherwise available at reasonable rates and upon reasonable conditions from private sources. Services and facilities of private insurance companies were to be used to the maximum practicable extent in providing reinsurance.

Corporate regulations would have governed the adjustment and payment of claims with recourse to a Federal district court in the event of disallowance.

The Carlson bill was referred to this committee during the 1st session of the 82d Congress. Following the usual procedure, the bill was sent by the committee staff to interested agencies in the executive branch for comment.

On December 5, 1951, the late Senator Maybank, then chairman of this committee, received a letter from RFC Deputy Administrator Bukowski in response to the invitation to comment on the Carlson bill (S. 2148). Mr. Bukowski made 5 points concerning the bill.

1. The program should be administered by the RFC or the Secretary of Commerce, the Treasury, or Agriculture instead of creating a new agency for that purpose.

2. The same agency should administer both the flood insurance and the war-damage insurance programs.

3. Because of hesitancy of private insurance companies to insure, it was doubted that the reinsurance approach alone would be effective.

4. Objecting to the rate-fixing provisions, he preferred that rates be actuarially based on risks alone without permitting any subsidy.

5. Unless credit of the United States was made available in addition, it was feared the \$50 million capitalization would be inadequate.

At a meeting with the Bureau of the Budget in December 1951, RFC Deputy Administrator Bukowski was requested to have RFC assist the Bureau of the Budget in preparing an administration bill dealing with flood insurance. The drafting assignment was given to General Counsel Robert C. Goodale of War Damage Corporation. Starting with the Carlson bill (S. 2148), Mr. Goodale revised and redrafted it, he and Associate General Counsel Alan B. Brown of RFC having conferred with representatives of the Bureau of the Budget late in December 1951. On December 28, 1951, the general flood insurance problem was discussed with Mr. J. Victor Herd, who had been vice

president of War Damage Corporation and executive vice president of the America Fore Insurance Group.

On January 30, 1952, the draft flood insurance bill was circulated by the Bureau of the Budget to RFC for comment, as well as to 12 other executive agencies. After consideration of the draft bill by RFC personnel, Administrator McDonald on March 28, 1952, replied to a March 18, 1952, request from the Bureau of the Budget and suggested several comparatively minor changes in the bill.

By April 25, 1952, President Truman had decided to submit a message to the Congress requesting flood-insurance legislation. Following clearance of the proposed draft of legislation to be submitted to the Congress for its consideration, the President on May 5, 1952, sent a Presidential message to the Congress containing recommendations relative to national flood insurance, and attached a copy of the draft legislation. The message and accompanying draft bill were printed as House Document 458, 82d Congress, 2d session, which appears in appendix E, page 375.

On May 9, 1952, Senator Maybank, as then chairman of this committee, introduced by request the bill suggested by the President in his message. It became S. 3146 and was referred to this committee. On May 5, 1952, a companion bill was introduced in the House of Representatives by Congressman Bolling as H. R. 7726. It was referred to the House Committee on Banking and Currency.

Under S. 3146 the Reconstruction Finance Corporation would have been authorized to provide insurance or reinsurance against loss or damage to real or personal property, including farm commodities and property owned by State or local governments, due to floods occurring within the United States, its Territories, or possessions. War-risk coverage would have been expressly excluded. RFC would have been authorized to prescribe premium rates by type of insurance and the terms and conditions of the policy. Premium rates would have been computed on a basis, considering the risks, intended to cover operating expenses as well as loss reserves.

RFC would have been authorized to determine the types and locations of property covered and the nature and limits of loss or damage in any area eligible for insurance or reinsurance as well as the rates, terms, and conditions of the policies. RFC would have been expressly authorized to decline particular applications and risks. The maximum limit of insurance to any one person or State or local government would have been fixed at \$250,000. No claim would be paid in excess of the cash value or repayment cost (less depreciation) of the property damaged. A loss deductible clause would apply to each claim, amounting to \$300 plus 10 percent of the remainder or any larger amount prescribed by RFC in the policy. RFC could regulate the issuance of policies to affiliated corporations.

No insurance or reinsurance could have been issued for risks eligible under other Federal programs or to the extent of coverage available on reasonable terms from other public or private sources; nor for property used in conflict with flood zoning laws. Private insurance companies or other insurers would have been authorized to participate financially in the underwriting of risks. RFC would have been directed to use the facilities and services of public agencies and private insurance companies, agents, brokers, and adjustment organizations

to the maximum practicable extent consistent with the minimum cost of providing insurance protection.

Any federally aided property could have been required prospectively to carry flood insurance.

The maximum liability of RFC under the bill would have been limited to \$500 million outstanding at any one time after the beginning of the sixth month following passage of the bill. With Presidential approval cumulative increases of \$500 million each could have been made on July 1, 1953, and July 1, 1954. The bill would have created a national insurance fund in the United States Treasury, its capital to consist of amounts advanced from appropriations authorized without fiscal year limitations. Advances to the fund would have been made as requested by RFC, which would have been required to pay the Treasury the average rate of interest on marketable United States public debt obligations. Into the fund would go premiums collected by RFC plus interest earned on investments of the fund in United States obligations and receipts from other obligations under the bill. The fund could be used both to pay insurance liabilities and expenses of operations of the program.

RFC would have appointed an advisory committee of three persons experienced in writing property insurance to advise concerning execution of functions under the bill.

Claims would have been adjusted and paid by RFC directly or through agents, and RFC would have collected the necessary shares from participating companies. Judicial review in a United States district court would have been permitted for disallowance of claims or refusal to accept a partial allowance.

RFC would have been required to study the program under this bill to June 30, 1954, and the practicality of providing against business interruption due to floods. RFC would have reported to Congress on or before January 3, 1955.

Pressing consideration of amendments to the Defense Production Act by this committee made it impractical for it to hold early hearings on S. 3146. On July 1, 1952, the House Committee on Banking and Currency held an open hearing on H. R. 7726, but took no further reported action on the measure. The draft bill progressed no further in the 82d Congress.

No bill dealing with flood insurance was introduced either in the 83d or, to date, in the 84th Congress in the Senate. In the House Congressman Bolling reintroduced H. R. 7726 as H. R. 377 on January 3, 1953. No further legislative action was taken on this bill.

#### RECENT DEVELOPMENTS

Renewed interest in legislation of this nature arose following the disastrous loss and damage caused by hurricanes and floods in August 1955.

After requests by Senators Lehman and Bush of this committee and by other Members of Congress Senator Fulbright, chairman of this committee, directed staff action on a study of the practicability of Federal disaster insurance looking toward action on possible legislation as soon as the Congress shall reconvene.

On August 28, 1955, Senator Lehman's office announced he would introduce an omnibus bill providing for Federal disaster insurance

and empowering the Federal Civil Defense Administration to meet the effects of manmade (atomic) and natural disaster.

Similar evidences of interest in arranging for consideration of appropriate legislation were received from several other Members of the Congress, including Senator Carlson, Senator Ervin, Senator Green, Senator Johnston of South Carolina, Senator Kennedy, Senator Pastore, Senator Payne, Senator Purtell, Senator Saltonstall, and Congressman Dodd.

On September 12, 1955, Senator Kennedy and Senator Saltonstall sent to their colleagues in the Senate the following letter, inviting cosponsorship of a draft of a flood-insurance bill enclosed with the letter and proposed to be introduced in the Senate when the Congress reconvenes:

**COPY OF LETTER ON PROPOSED FEDERAL FLOOD INSURANCE BILL SENT TO ALL SENATORS**

DEAR SENATOR: The recent floods—which cost homeowners and businessmen in our area over \$2 billion in destructive damage for which they had no insurance protection—reconfirmed the necessity for congressional action on some program of nationwide flood insurance, to spread the risks of future losses, to soften the destructive blows such disasters bring, and to make possible earlier rehabilitation of flood areas.

Although flood damage in the past two decades—particularly in the basins of the Ohio, Missouri, Mississippi, and Columbia Rivers, and in the Northeastern Southeastern, and Southwestern States regions—has created a heavy demand for this type of insurance, private insurance companies have concluded that they are unable to provide sufficient coverage at rates both reasonable and adequate. If this problem is to be met, without heavy Federal subsidies, increased relief expenditures, and continued loss of homes, productive facilities, and morale, Congress must establish some kind of Federal flood-insurance and reinsurance program, beginning as we did with the crop and war-risk-insurance programs on a small experimental basis.

Our purpose in preparing this proposal is to focus congressional attention on this very serious and difficult subject. Other catastrophes wrought by nature—tornadoes, hurricanes, earthquakes—have, like floods, caused great damage to our Nation in the past. Relief from such disasters also deserves careful and thoughtful study by the Congress.

The reason for our bringing this draft of our flood insurance bill, with an explanatory memorandum outlining its background and key features, to your attention at this time is to permit early consideration in the next session of Congress by allowing, in the interval, review by Members of Congress, Federal officials, insurance spokesmen, and other experts. We would welcome your cosponsorship of the bill and your suggestions for its improvement. If possible, we would appreciate hearing from you in regard to this matter before the end of the year, in order to make possible introduction of the bill early in January.

With every good wish,  
Sincerely yours,

LEVERETT SALTONSTALL, U. S. S.  
JOHN F. KENNEDY, U. S. S.

The proposed Kennedy-Saltonstall bill, together with a bill proposed by Senator Lehman, one proposed by Senator Carlson, and another bill prepared by the staff upon request, is printed in full later in this study for convenience of reference.

The staff has been advised that still other bills on the subject may be prepared for introduction in the Congress when that body reconvenes.

Paralleling this activity, a study of the feasibility of a Federal flood-insurance program has also been undertaken by the executive branch. Members of the committee staff, the staff of the House Committee on Banking and Currency, and representatives of the executive branch

have worked closely together on this general problem along with representatives of business, the insurance industry, and lending institutions in an effort to expedite action and obtain a maximum interchange of informed ideas on the problem of providing a Federal program of insurance, reinsurance, or indemnity in the fields of natural and man-made disaster.

#### RECENT LEGISLATIVE PROPOSALS RELATING TO WAR DAMAGE INSURANCE

Subsequent to the date WDC ceased its operating functions, several attempts have been made to revive the WDC program by legislation or to enact laws for similar programs.

In December 1950, the House passed and the Senate Banking and Currency Committee reported favorably a bill, H. R. 9802, to reactivate the War Damage Corporation. Insufficient time was left in that 81st Congress, however, to meet the objections of those who wanted the bill amended to include reinsurance by the Government of workmen's compensation liability insurance.

At the beginning of the 82d Congress, three bills were introduced in the Senate on this matter. S. 439, by Senator Magnuson, would reactivate the War Damage Corporation. S. 114, by Senator Ferguson, would do that and also provide Federal protection through reinsurance (and insurance of self-insured employers) against workmen's compensation liability for war-caused losses. S. 1309, by Senator Ives, includes all features of S. 114 and also authorizes the War Damage Corporation to provide through insurance, reinsurance, or otherwise, reasonable compensation for personal injury or death suffered by any civil-defense worker in performing his duties.

Public hearings on these three bills were held on April 18, 19, 24, 25, 1951, by the Subcommittee on Securities, Insurance, and Banking. At the April 25 session, testimony was received from the Bureau of the Budget indicating its views on war-damage legislation were then tentative.

The subcommittee urged the Bureau to hasten its work on the problem, so that we in the legislative branch might know the final views of the executive branch on this type of legislation.

Chairman Frear, as soon as the Budget Bureau completed this task, on July 11, called another hearing of the subcommittee. The views then expressed by the Budget Bureau were incorporated in a bill he introduced by request, so that it might be available for comment. That bill is S. 1848, known as the War Disaster Act of 1951.

In general it adopted an indemnity, rather than an insurance, approach to the problem and provided broad authorization to the executive department to use Federal Treasury funds to provide intermediate restoration of community services (such as waterworks) damaged by warlike actions (title I); provide income maintenance for injured civilians and dependents of civilians killed and also for civilians in want due to warlike actions (title II); and recompense partly owners of real property (public and private) damaged by warlike action (title III). There was an open-end authorization for appropriations to carry out titles I and II. For title III, \$20 billion was authorized for private property claims, with added authority to accept up to \$500 million of obligations of local governments as collateral for loans to them by the Federal Government to repair or replace damaged

public property. Title II contained provisions letting the President declare a moratorium on payments from any workmen's compensation system. (This was meant to be broad enough to cover self-insured employers.) It could be declared only if the President feels war injuries or deaths endanger the solvency of any State workmen's compensation system. It could last not more than 6 months after the calendar month in which ends the first full regular session of the State legislature after enactment of the act. The theory was that by then the State would have excused employers and insurers from liability for payments for war injuries to workmen. Title II also contained a provision for matching Federal grants to States to compensate civil-defense workers injured or killed on duty or in training.

Because of the comprehensive scope of S. 1848, the subcommittee decided to let sufficient time elapse for those interested to digest and comment upon the bill before taking any further action. Some subcommittee members and the staff held two informal conferences in August with representatives of the casualty and surety companies interested in workmen's compensation liability. The latter urged amendments to have the Federal Government excuse them from liability for payments to workmen injured by warlike action. Similar conferences were requested by representatives of life-insurance companies and held. Representatives of the fire companies writing property-damage insurance did not comment on the bill at that time, but did in 1952. The United States Chamber of Commerce opposed S. 1848, urging a premium insurance approach to compensate for war damage to property. No requests were received for further public hearings.

The subcommittee took the following action in 1952.

1. Conferred with representatives of the life-insurance industry in informal conference on January 18. Briefly, the life-insurance people neither approved nor opposed legislation on this subject at that time, but suggested certain points for consideration if the subcommittee decided to report a bill on the subject.

(a) Restrict the program to emergency needs.

(b) Opposed a moratorium on payments which apply only to insurance companies, feeling that if the moratorium approach is adopted it should apply to all financial obligations.

(c) In doubt whether property damage should be covered by general indemnity by the Federal Government rather than by a premium plan similarly used by the War Damage Corporation during World War II.

(d) Opposed provision setting up complete records on values of properties in the United States.

(e) Opposed provision of bill which split immediate payment of claims for property damage at \$5,000. Felt this would discriminate against properties of greater value which are more likely to sustain greater damage.

2. The subcommittee conferred in informal conference with representatives of the Blue Cross Commission on March 5. The following is a digest of Blue Cross' opinion:

(a) Neither advocated nor opposed legislation in this field at that time.

(b) If subcommittee decides to approve legislation, Blue Cross wanted to be certain that the language in the bill is broad enough to include nonprofit organizations such as Blue Cross which supplies hospitalization services and Blue Shield which supplies medical services.

(c) Opposed United States Government's right to subrogation against Blue Cross for claims paid by the United States Government. Felt this would make the Federal Government the dominant creditor of Blue Cross and it might put Government into the insurance field permanently.

(d) Blue Cross rates are not loaded for war risk.

(e) Rather than subrogation approach, would prefer the Federal Government reimburse Blue Cross for all claims paid by Blue Cross, or provide a reinsurance program run by the Federal Government for private companies.

(f) Suggested clarification of language of bill to limit President's authority to invoke title I on medical services only in actual time of war risk upon declaration of an emergency by the President.

(g) Suggested President be limited to granting relief only to those in want due to war injuries and not to those in want from other causes.

3. The staff has conferred with Federal Civil Defense Administration and Budget Bureau representatives concerning possible overlap of title I of S. 1848 with present authority of the Federal Civil Defense Administration. FCDA submitted a report on this matter to Senator Frear dated January 5, 1952. This was forwarded to the Budget Bureau for study.

FCDA admitted it lacked authority in two general fields which are covered by title I; namely, (i) permanent rehabilitation of community facilities; (ii) authority to lend or grant funds to private industries for rehabilitation for industrial plants damaged by war risk. The query was whether it would be preferable to expand FCDA's authority in this area rather than create overlapping authority in title I. The Budget Bureau indicated it prefers flexibility in the program so that the rehabilitation powers granted in title I can be exercised by the Federal agencies best fitted to do so at the time it becomes necessary to exercise them. It suggested that FCDA might well be that agency at that time.

4. The Associated General Contractors of America, Inc., requested an informal conference with the subcommittee. They were interested in coverage for incomplete construction of buildings.

5. The National Board of Fire Underwriters reached the following conclusions as set forth in correspondence to Senator Frear:

(a) A paid premium program is not feasible because of catastrophic war losses which are possible.

(b) A program of full indemnity without premium is not feasible for such losses.

(c) Legislation now would probably have to be limited to cover continuance of the war effort, relief measures, and restoration of facilities essential to preserve life and health.

(d) Agreed with the basic premises outlined by the Budget Bureau in presenting S. 1848 to the subcommittee, but suggested the following amendments:

(1) Delete presently authorized appropriation.

(2) Delete present implementing of administration setup in title III for property damage.

(3) Delete provision for preserving records of cost, value, and ownership of property.

(4) Revise present split of claim payments at \$5,000 by letting all payments await end of hostilities.

(5) Add provision of termination of entire program instead of present open-end provision.

(6) Allow authorized claims to be presented by survivors of original claimant.

(7) Afford review for claimant similar to that provided by Administrative Procedure Act.

6. The subcommittee received no later requests for hearings on this matter. The main groups interested submitted views by letter or by informal conference.

7. The staff suggested the following alternatives for disposal of this problem by the subcommittee.

(a) Prepare a specific bill based primarily on S. 1848 to constitute legislation in this field.

(b) If it was felt that no detailed legislation was advisable at that time, adopt a declaration of policy of Congress recognizing the responsibility of the Federal Government for war-caused damage and assert an intention to adopt detailed legislation in this field as soon as the danger of war-caused damage becomes imminent.

(c) Reach a conclusion that the problem is so vast and unforeseeable that no legislation should be adopted at this time but should await the actual happening of war-caused damage at the time Congress would be confronted with a specific set of facts upon which to base action. The danger of this approach is that action would then be immediately required by the Congress with little chance for deliberation.

Had the subcommittee decided to adopt approach No. 1, the staff noted it had available ample suggestions for legislation received periodically since December 1950 from which to prepare a specific bill for consideration by the subcommittee.

On July 5, 1952, Senator Frear introduced Senate Joint Resolution 171, stating a declaration of policy concerning war damage. On February 10, 1953, in the 1st session of the 83d Congress, Senator Frear reintroduced the same resolution as Senate Joint Resolution 40.

On January 16, 1953, then Senator Ferguson introduced S. 476, to grant succession to War Damage Corporation. Senate Joint Resolution 40 and S. 476 were referred to this committee's Subcommittee on Securities, Insurance, and Banking, but no further action was taken on them.

No bills or resolutions on this subject have been introduced to date during the 84th Congress.

However, this general topic is included within the scope of the forthcoming committee hearings. Two of the proposed bills set forth later in this study include provisions for war-damage insurance.

## TAX LOSS

In considering losses from natural disaster, tax losses should not be overlooked. This may be deemed a secondary loss, in that its incidence falls not on the disaster victim, but on the taxing body. Such losses occur in several forms. Unfortunately for the purpose of this study, they are not readily calculable, but their presence is a matter of fact. To the extent any such tax loss would be avoided by an insurance or indemnity program for reimbursing losses of disaster victims that would otherwise result in tax losses, the insurance or indemnity program could incur a seeming deficit and still not result in net loss to the sponsoring governmental, taxing body. For example, for every dollar the Federal Government now loses in income tax due to unreimbursed disaster losses, that Government could spend \$1 in an insurance or indemnity program without increasing the net cost of the program to the Government.

In the case of Federal individual income taxes, the most recent statistics available show that in individual income-tax returns for 1952, a total of \$367.5 million was deducted by prospective taxpayers as net losses on nonbusiness property resulting from destruction by fire, storm, automobile accident, shipwreck, flood, or other natural physical forces and from losses due to theft. In this case, net loss is arrived at by deducting from the value of the property just before the loss, the sum of salvage value and insurance or other reimbursement received. Of this total, almost \$71.9 million was deducted in nontaxable returns. Whether the return became nontaxable due to this particular type of deduction, the statistics do not divulge.

The remaining \$295.6 million of the total was deducted in taxable returns. This portion of the total assuredly had some effect in reducing the taxpayer's total tax.

It is to be noted, of course, that these amounts include deductions for several types of losses besides floods. However, since the other types are generally commercially insurable and insured, the proportion of these amounts represented by commercially uninsured flood losses may be assumed to be relatively high. Even were this proportion known exactly, the amount of actual tax loss caused could not be computed without additional information, since the value of the deduction for tax purposes would vary with the taxable income bracket of the taxpayer. The higher the bracket, the more value does the deduction represent to the taxpayer and the more tax loss does it represent to the Federal Government.

The greatest amount of such deductions in any classes of adjusted gross income as classified by the Internal Revenue Service falls in the \$5,000 to \$7,000 categories. This amount totals \$80.7 million divided among the approximately 2.8 million taxpayers filing returns with itemized deductions. This group had a total Federal income-tax liability of about \$1.7 billion on taxable net income of around \$13.5 billion. In other words, roughly 13 percent of the taxable net income of this group went for taxes. Setting aside the fact that the lack of a deduction might have placed the taxpayer in a higher tax bracket, it seems fair to assume that 13 cents of every dollar deducted for flood loss represented an income-tax loss to the Federal Government from those taxpayers who chose to deduct unreimbursed flood losses

for tax purposes. Applying this percentage to unreimbursed non-business losses actually deducted by this particular group indicates a loss to the Federal Government of \$80.7 times 13 percent equals \$10.5 million in round numbers. How much of this is due to flood losses remains conjectural in the absence of additional statistics but, as noted above, a substantial portion of the \$10.5 million tax loss is represented by unreimbursed flood losses. Projecting this as an average to the total \$295.6 million deducted in taxable returns would result in a tax loss to the Federal Government of about \$38.4 million. While these statistics cannot be taken as absolutes, they give some idea of the possible magnitude of tax loss on 1952 returns from individual taxpayers making itemized deductions. The fact that the above statistics do not include the 77.3 percent of returns by individual taxpayers who chose to take the optional standard deduction of \$1,000 or 10 percent of adjusted gross income does not alter the validity of the foregoing conclusion. Any unreimbursed flood or disaster loss sustained by a taxpayer using the optional standard deduction does not represent a tax loss to the Government anyway, because the taxpayer may still take the optional standard deduction whether he suffers a disaster loss or not.

However, the foregoing statistics do not include income-tax losses to the Federal Government due to unreimbursed flood or disaster losses suffered by corporate taxpayers. No statistics are readily available at the Internal Revenue Service to reveal the magnitude of this loss. As an offset to tax gains were such losses reimbursed, one must consider that any premium paid by a corporation for the right of such reimbursement would become a tax deductible business expense.

An unknown but present additional tax loss to the Federal Government is represented by excise taxes lost due to interruption of production of items subject to such taxes, whether such interruption is caused by flood or other natural disaster.

States suffer similar income and excise-tax losses from unreimbursed disaster losses, depending upon the provisions of the respective State tax laws.

In addition, States and local public bodies also may suffer loss of sales-tax revenue to the extent that a natural disaster causes a decline in the number of taxable sales transactions. An offsetting factor is the forced purchase of materials and services necessitated to repair damage caused by such a disaster.

Local taxing bodies also feel the impact of loss of property-tax revenues due to a decline in assessed values of property for tax purposes, where such property is damaged or destroyed by natural disaster and not replaced by taxable property of equal assessed value.

Yet another source of tax loss due to natural disaster is the cessation of or decline in profits, dividends and wages suffered as a result of such disaster. This effect may well persist beyond the taxable year in which the disaster occurred.

In general, it seems warranted to conclude that all such taxing bodies stand to realize a net gain in tax revenues if natural disaster losses are reimbursed, reductions in property values minimized and interruptions to business productivity held to as low a level and for as short a period as possible.

## ARGUMENTS FOR FEDERAL INDEMNITY PLAN

1. Such a plan would keep the credit of a disaster victim sound; it would prevent his being left with debt and no assets.

2. It would thereby quicken the pace of his economic recovery. With credit, he can get a new start.

3. With quicker economic recovery, net income increases, thus increasing tax income to governments.

4. With quicker economic recovery, sales transactions increase more rapidly, thus producing more sales-tax income for governments.

5. Reimbursing the loss of a disaster victim deprives him of a tax deductible item for income-tax purposes, thus increasing the tax income to governments.

6. With an indemnity program to assure disaster victims against loss, expense could be saved on physical protective works now built extra high in the absence of an indemnity program. The top few feet of a dike or levee may be quite costly in comparison to the lesser risk of a flood overflowing the dike at that level.

7. Existence of an indemnity program would make unnecessary the provision of Government relief to an equal amount; and the indemnity program would be supported at least in part by advance contributions from potential victims of disaster.

8. Existence of an indemnity program with premium rates increasing according to the risk anticipated would encourage less use of the locations subject to greater risk, thus reducing the potential amount in dollars of damage caused by a given disaster.

9. Such a plan would contribute to the peace of mind, morale and feeling of self-reliance of the potential disaster victim by affording him means of warding off the economic impact of disaster ahead of time.

10. By comparison with enterprise for profit, the Federal Government may operate the program on a breakeven (or even a subsidy) basis.

11. The Federal Government has means of raising funds to meet the sudden impact of a disaster under a program in which total Government liability is limited by statute. It is not subject to the same difficulty as would be a private insurer seeking to find ways of raising funds with which to pay off approved claims due to the impact of disaster in the early years of the program before adequate reserves can be built up primarily from premiums and investments.

12. A Federal reinsurance program of the excess-loss variety, coupled with a high loss deductible feature (or assumption of the first portion of the loss by the Federal Government) and coinsurance by the Government of the remaining portion of each loss to a preagreed percentage, should enable the insurer to confine its exposure to such a narrow, definite range as to make possible the fixing of low premiums on an actuarial basis to cover the insurer's net liability under each claim. As a corollary, any charge by the Government for such reinsurance could be made low enough on a calculated risk (but not actuarial) basis, to induce purchase of such coverage for the sum of the comparatively low Government charge plus the actuarially based charge to cover the private insurer's liability.

13. This problem involves an instance where Government can do for the people that which neither private industry nor they themselves can or will do for them—devise a workable flood-indemnity program.

14. Objections to certain features of plans under discussion can be met without discarding the opportunity to enact a feasible plan.

15. Maximum exposure of the Government to liability under the program can be controlled by statutory limitations.

#### ARGUMENTS AGAINST FEDERAL INDEMNITY PLAN

1. If premiums are set on an actuarial basis, they will be so high as to discourage potential purchasers.

2. If premiums are not set as high as actuarial principles demand, the program will involve Federal subsidies.

3. Under such circumstances, victims who have not availed themselves of the indemnity program will nevertheless press claims for relief from Government or private sources, rationalizing their action on the theory that victims who have received insurance benefits did not really pay fair value for them in premiums.

4. Certain of the proposals under discussion as part of a possible Federal indemnity plan would conflict with insurance coverage already offered by private insurance companies.

5. Any part of a proposed plan that involves charging a fee to a person not subject to one or more of the perils covered by the indemnity agreement is obnoxious to insurance principles.

6. Unless true insurance principles are used in creating and administering a Federal indemnity program, the word "insurance" should not be used to describe such a program; else confidence of the public in true insurance plans, public or private, may be unjustly and dangerously shaken. This might occur should the so-called insurance plan fail to be a financial success or it might lead to an unjust comparison of the basis for actuarial rates for true-insurance plans with non-actuarial charges for the Federal indemnity program.

7. Because of its untried nature and the serious doubts some have concerning feasibility of a Federal disaster indemnity reinsurance plan, private insurance companies may hesitate to issue policies in the name of their own companies, even though Federal reinsurance is available.

8. While private insurers are able profitably to cover risks of other disasters where catastrophic losses occur relatively infrequently or comparatively minor losses occur frequently, they cannot believe it profitable to attempt to insure such risks as floods and high water where losses are catastrophic and occur frequently.

9. Mortgagees will not be inclined to purchase high-cost flood insurance to protect their own interests but will be inclined to rely on their ability to accept mortgages on a selective basis with the flood risk in mind. Under such circumstances, flood losses to properties covered by mortgages in their portfolio will not cause any severe loss to the portfolio. Past practice has involved recasting the mortgage debt of a flood victim or in effect granting a moratorium on collection of mortgage payments until the victim's ability to pay is reestablished.

10. Any mortgagee insisting on the purchase of flood coverage to protect his interest may run the risk of losing business to a competitor who does not require such a purchase.

11. Likewise, any insurer adding flood risk to extended coverage offered may lose business to his competitor who does not follow such a practice, as the loading of the premium for flood risk would probably be substantial in amount.

12. If high-risk areas are excluded from the program, it will not provide indemnity where most needed after disaster; if they are included, the resulting premium charge on an actuarial basis may prove to be so high as to be prohibitive; while if the charge is lowered to a rate acceptable to the high-risk purchaser, either the non-high-risk purchaser's premium must be unfairly increased to make the program self-supporting or the whole program will require a Federal subsidy.

13. Federal programs indemnifying catastrophic losses on a contractual obligation basis may result in required subsidies catastrophic to Federal budget balancing and a sound fiscal policy.

14. Awaiting the occurrence of loss and computing Federal relief then available consistent with other needs plus relief from other public and private sources seems a more practical method of handling the problem of flood damage.

15. The "brother's keeper" approach has worked satisfactorily in the past in caring for flood victims; American residents are especially generous and humanitarian with money, goods, and services in times of trouble; but have a psychological resentment against even a small increase in taxation needed to supply such money, goods, and services. In recent disasters, flood-relief contributions have even come to the United States from foreign lands.

16. An ounce of prevention being worth a pound of cure, Federal funds should be used to aid in building physical protective works against flood risks rather than committed to a "curative" indemnity program.

17. Because of the long period of years that would be required for a true appraisal of the success or failure of a flood-insurance experiment, a trial of only a few years might prove unreliable and deceptive in either direction.

18. Obtaining a greater number of insured persons by issuing high-risk policies is compounding, not spreading, the risk.

19. On a voluntary program, the risks of adverse selection are too great; for only those will purchase the right to indemnity who are most exposed to flood risk.

20. If the principle of uniform charges for protection against flood risk is followed, undue encouragement will be given to unwise use of land areas most subject to flood risk.

21. Those who build in known flood-risk areas have probably gained the advantage of low cost of land acquisition.

22. Arbitrary statutory limits on total liability under the proposed program are weak straws against a demand for an increase in those limits by statutory amendment to meet an increased desire for more indemnity coverage.

23. For the same reason, arbitrary statutory limitation of those eligible to benefit from the program will be swept aside by demands from others showing equal rights to such benefits.

24. Brief past experience has shown a tendency to let flood-risk policies lapse during a favorable nonflood period in the area involved;

thus tending to decrease the number of policyholders rather than expanding it.

25. A similar tendency is shown when extended coverage rates are raised, as they were recently in some areas.

26. The dilemma presented is that a small total program will find it difficult to enjoy a spreading of the risk, but a large total program would be costly if a failure.

#### SPECIFIC TOPICS FOR DEVELOPMENT

Apart from the foregoing arguments pro and con, the forthcoming hearings provide an opportunity to develop testimony on the following specific topics pertinent to a Federal program of disaster insurance or indemnity:

1. Policy conditions?
    - (a) Premium rate-actuarial or less?
    - (b) Liability limit per policy?
    - (c) Limit per property or per insured?
    - (d) Loss deductible form?
    - (e) Coinsurance requirement—what percentage of value?
    - (f) Expiry of policy?
    - (g) Time lapse after issuance before policy becomes effective?
    - (h) Noncontestability clause—after what period of time?
    - (i) Cancellation rights?
    - (j) Assignability of policy?
    - (k) Eligibility of insured? How treat affiliates?
  2. Insurance or reinsurance?
  3. Shall private insurers issue on agreement with Government?
  4. Shall private companies recommend adjustment of claims?
  5. Government administering agency?
  6. Advisory committee from private industry?
  7. Total liability under program?
  8. Government reimbursement of loss payable on policies issued by private insurers?
    - (a) What portion of 100 percent?
    - (b) First part of loss payable up to agreed amount?
    - (c) Excess loss over named amount?
  9. Types of policies issued—blanket mortgage policy? Blanket natural disaster policy?
  10. Items insured—real property, privately or Government owned? Personal property, privately or Government owned, personal injury, illness or death?
  11. Require Government-aided mortgagors carry insurance?
  12. Provide reinsurance against catastrophic excess loss on portfolio basis?
  13. Provide group insurance for community residents, premium to be paid by community by tax or otherwise?
  14. Provide line of credit with private lending institution backed by Government guaranty, for commitment fee?
- While not exhaustive, this is a representative list of questions that should be answered as a basis for sound legislation.

## APPENDIX A

## EXPERIENCES WITH FEDERAL CROP INSURANCE

The following information concerning the crop insurance program has been made available for committee use through the kind cooperation of Mr. W. H. Rowe, of the Federal Crop Insurance Corporation, who prepared it originally in January 1954 and revised it in October 1954:

## FEDERAL CROP INSURANCE—A DESCRIPTION

## INTRODUCTORY DESCRIPTION

Federal crop insurance is a type of insurance not available from private insurance companies that is offered by the Federal Crop Insurance Corporation, an agency of the United States Department of Agriculture. This insurance covers essentially all natural causes of loss, including drought, flood, hail, wind, frost, winterkill, lightning, fire, excessive rain, snow, wildlife, hurricane, tornado, insect infestation, plant diseases, and such other unavoidable causes as may be determined by the Board of Directors. It does not cover such causes of loss as neglect, poor farming practices, or theft; nor does it cover the risk of financial loss due to low prices. Citrus insurance covers only a few causes of loss.

The insurance is voluntary, and for it the farmer pays a premium. The premiums are required to be set at a level believed adequate to cover losses and to provide a reserve against unforeseen losses. Operating costs have been borne by the Government through annual appropriations; this cost has not been included in the premiums farmers pay. The appropriation act for the year beginning July 1, 1954, authorized the charging of the direct costs of loss adjusters for crop inspections and loss adjustments against premium income. Such costs will be treated in the same manner as the cost of the indemnities for crop losses. It is not possible herein to describe the rate of premium the farmers have to pay because this varies widely by areas depending on (1) the crop insured, (2) the risk of the area, and (3) the amount of insurance per acre.

Federal crop insurance is not available in all counties and in most of the counties where it is offered, it is made available only on one crop. In 1954, one or more kinds of insurance was in effect in 803 counties out of about three thousand agricultural counties in the country. The reason that this insurance is not available to all farmers on all crops is that it is still in an experimental or developing stage. Some of the insurance is even now in the early stages of experimentation as, for example, the citrus insurance, whereas insurance of wheat which was started first may be considered as in the more advanced stage of development. In these counties more than a third of a million producers are insured.

The status of Federal crop insurance on 1954 crops is as follows:

Crop	Number of counties	Number of insured producers
Wheat.....	402	135,697
Cotton.....	101	33,224
Corn.....	99	32,673
Tobacco.....	107	95,403
Flax.....	53	23,451
Beans.....	24	6,352
Citrus fruit.....	2	394
Multiple-crop insurance.....	196	41,042
Total.....	884	368,236

<sup>1</sup> Multiple-crop insurance is a type of insurance whereby a number of crops are insured under the same contract.

<sup>2</sup> There are 803 counties with insurance. The total of 884 includes duplication where there is more than 1 kind of insurance in the county.

Roughly, insurance of a crop is effected by guaranteeing the farmer a certain amount of production and if the production amounts to less than that, he is indemnified for the shortage. At this point, it is not possible to describe the

insurance completely nor the different types of insurance but for a first approach and with many exceptions, the following illustration is given for the most widely used type.

Assume that a farmer has 100 acres of wheat and that he is insured for 10 bushels per acre. Assume also that the price of wheat fixed for insurance purposes in advance of the season is \$2 per bushel. The amount of insurance on 100 acres would be 1,000 bushels. Assume that the farmer harvested all the acreage and produced only 400 bushels. The production would be short 600 bushels from the amount guaranteed and at \$2 per bushel this would mean that he would be indemnified for \$1,200. The same thing can be expressed in dollars. The coverage would be \$2,000—the equivalent of 1,000 bushels at \$2 per bushel. The production of 400 bushels would be worth \$800 at the fixed price of \$2 per bushel. The indemnity would be \$2,000 less \$800, or \$1,200.

The above explanation is given both in bushels and dollars because under some insurance contracts, computations are made in bushels, whereas in other contracts for various reasons, the computations are made in dollars. Essentially, there is no difference in the two methods.

The above illustration is extremely brief and simplified; it will be explained more fully in later sections and deviations from the above will be explained.

#### LEGISLATIVE BASIS

The original act was passed by Congress and approved February 1938. It is known as the Federal Crop Insurance Act. It provided for insurance on wheat only. This act was amended in 1941 to include cotton. Insurance was suspended for 1944 by appropriation legislation but reinstated for 1945 on the basis of an amendment to the Federal Crop Insurance Act, adding flax and providing authority for experimenting with insurance on other commodities. After loss of considerable capital in the early years, the act was amended again in 1947 and the program was reduced in scope to an experimental basis. In 1949 the legislation was amended again, setting up for a 4-year period a gradual basis for expansion. In 1953 provision was made for continued expansion.

The legislation establishes the Corporation as an agency of and within the United States Department of Agriculture and provides for a Board of Directors appointed by the Secretary of Agriculture, composed of the Manager of the Corporation, 2 other employees of the Department of Agriculture, and 2 persons experienced in the insurance business who are not otherwise employed by the Government. The act also authorizes the capital for the Corporation intended to serve as a revolving fund and sets up the basis for the insuring of crops. The operating organization was set up as a corporation so that it might operate somewhat as a private insurance company.

#### ADMINISTRATIVE ORGANIZATION

The Secretary of Agriculture is responsible for the administration of the program through the Board of Directors appointed by him, and a Manager. Currently, the Board of Directors is made up of an Assistant Secretary of Agriculture, the Manager of the Corporation, the Administrator of the Commodity Stabilization Service, and an individual experienced in the field of mutual insurance and another experienced in the field of private stock company insurance.

The Board of Directors determines overall policies and approves the terms and conditions of the insurance contracts offered.

The Manager of the Corporation is the executive head of the Corporation. The headquarters office is in the Department of Agriculture in Washington, a branch office is in Chicago, and there are State crop-insurance offices for individual States or groups of States.

The headquarters office consists of the Office of the Manager and five Divisions—Underwriting, Sales and Servicing, Claims, Finance, and Administrative. Four area directors stationed in the field are responsible for directing and coordinating activities in their areas. The functions of the headquarters office are primarily the determination of policy, the planning and development of the insurance, the establishment of the coverage and premium levels at which it is sold, and the supervision and coordination of activities.

Actual insurance contracts are not processed through the headquarters office. The branch office in Chicago is the central office for insurance contract records, their examination, the computing of premiums, and billing of insureds, receiving premiums, computing and paying indemnities, maintaining program-accounting

records, and summarizing statistical data for general and actuarial purposes.

There are 20 State offices. While these are called State offices some serve 2 or more States, especially in the case of States where the insurance volume is not large. A State director is in charge of the insurance in this State or group of States, and has one or more district supervisors as assistants. He has charge of the insurance operations in his area, including the selection and supervision of insurance agents and the selection and supervision of loss adjusters. He operates under the direct supervision of one of the area directors.

Generally, in each county there is an insurance agent. His function is to sell the insurance and to service it, such as obtaining acreage reports, collecting premiums, and receiving notices of loss. He is paid on a commission basis. His office is known as the county office. It is the local contact point for the farmer, a place where the farmer can obtain information, buy crop insurance, report his acreage, pay his premium, and report losses. The agent may have insurance salesmen and others working for him. Previously these functions were performed by the county committees and county offices of the former Production and Marketing Administration of the United States Department of Agriculture. The changeover became fully effective at the beginning of 1954.

The other direct contact with the farmer is the adjuster who is responsible not to the agent but to the State director. He is a part-time employee of the Corporation working only when needed. In some cases he may be a local person working principally in his home county or he may be from outside the county. He is a farmer or one who has previously been engaged in farming. Upon notice of damage or loss given to the Corporation by the insured, he inspects the crop, may release some acreage, and adjusts the loss after harvest.

#### HISTORY OF FEDERAL CROP INSURANCE

The Federal Crop Insurance Act was enacted in 1938. This action followed a long period of frequent and severe droughts in the 1930's. There was no private insurance available on crops except against hail damage and in some areas fire damage. The original act provided only for the insurance of wheat. Wheat insurance was started on the 1939 crop and was in operation for 3 years when cotton insurance was added. Losses in the early years were heavy with losses exceeding premiums on both wheat and cotton in each of the first 5 years, 1939-43. Heavy wheat losses, for example, occurred due to droughts in the southern half of the Plains States in 1939 and 1940 and to widespread winterkill in 1941. However, part of the excessive loss can definitely be attributed to the fact that there were defects in the insurance and it took some years before these could be corrected.

Some of the early features of the insurance which have been changed since then as a result of experience are given below. Some of the changes were primarily to improve the soundness of the insurance; others were primarily for simplifying and improving the operations. The farmer had the option of insuring either 75 percent or 50 percent of the long-time average yield on his farm. Most of the insurance was written for 75 percent. Since 1948 the insurance has also been restricted generally to the investment in the crop in the area and this has brought about more conservative amounts of insurance per acre. Furthermore, during the early years an insured was paid losses on the basis of this coverage of 75 percent or 50 percent of the average yield even though his crop failed early in the season. Today the amount of protection is progressive as the crop advances during the season. In the early years not only the coverages, but the premium rates were established on individual farm rating. This proved cumbersome and unsatisfactory for various reasons. The area method described earlier replaced this method. Closing dates for applying for insurance were not generally as far in advance of the planting season as they have been in recent years. Insurance contracts during the earliest years were annual contracts necessitating writing all the insurance every year. There was no minimum participation requirement for a county in the earliest years and in many counties there were only a few contracts. Insurance was sold in a great many counties even though there was little wheat or cotton produced there. In recent years counties selected for insurance purposes have been counties where the crop insured provides a substantial part of the farm income. During the early years of the insurance there was less centralized control of the adjustment of losses than there has been in recent years. Prior to 1945, loss adjustment was the responsibility of the local committee; since that time, loss adjusters directly responsible to the Corporation have performed this important function.

The original concept was one of insurance "in kind" to avoid price risks. A few premiums were paid in wheat and, during the first year, warehouse receipts for wheat were given for indemnities. As time progressed this grew into a system whereby the farmer paid his premium in cash at current values and the Corporation bought wheat or cotton with the funds. Indemnities paid farmers were in cash at the current value of the wheat or cotton due him and wheat or cotton in the reserves was sold to provide the funds. The buying and selling of wheat and cotton became essentially a hedging operation to protect the Corporation against price changes between the time of establishing the price basis for premiums and the time of establishing the price basis for indemnities. The period when this method was used was a war and early postwar period with generally rising prices between premium and indemnity times. At the end of this section there is a table of experience which has a column showing a substantial net profit from purchase and sale of commodities. This should not be considered a source of income independent of the insurance operations but rather as an offset to the indemnities which are higher than they would have been had prices not been rising. Under the present method of using a fixed price each year for both premiums and indemnities, the hedging operations are no longer used.

As a result of the heavy losses in the first 4 years the appropriation in the summer of 1943 provided sufficient funds only for liquidation. There was no insurance on 1944 crops nor on the 1945 winter wheat crop planted in the fall of 1944.

By action of new legislation near the end of 1944, the crop-insurance program was revived and flax was added as an insurable crop. This legislation also provided for experimental insurance on other commodities in not more than 20 counties for each. The legislation was passed in time to insure spring planted crops for 1945. These covered spring wheat, cotton, and flax. In addition, small experiments were started on corn and tobacco. With the revival of insurance in 1945 a number of changes were made that helped to improve the insurance. These included the adoption of a coverage that was progressive during the season and adjustment of losses by direct representatives of the Corporation.

As a result of the new legislation and other changes made in the insurance and its operation the financial experience improved greatly on wheat and the experience on flax, tobacco, and corn was quite satisfactory. However, large losses occurred on cotton insurance in 1945 and 1946, primarily as a result of droughts in the Southwest. By the end of 1946, over three-fourths of the original capital of \$100 million had been lost. However, a profit of about \$8,500,000 was made in 1947 recovering part of these losses, but not before the Congress had reviewed the operations in the light of the 1945 and 1946 experience and had decided to reduce the program to more of an experimental basis. Insurance was authorized in only a limited number of counties. There were 200 wheat counties and 56 cotton counties and a smaller number of counties for the other crops. Provision was made that insurance should not exceed generally the investment in the crop in the area. While the number of counties was restricted, the Congress indicated that this experimental period should be used to develop insurance for other types of crops so that when the insurance was offered again in some of these counties, it could be offered not necessarily on wheat or cotton but on the crops that provided the major source of income for the farmers there. Since then insurance has been started on beans and citrus fruits and with the multiple-crop insurance started in 1948, insurance has been applied to many different crops.

This limited and experimental approach went into effect beginning with the 1948 crop. There were 375 county programs whereas in 1947 there had been over 2,400 such programs. Consequently, a new period in the history of the Corporation was begun at that time and present published reports do not carry the record back beyond 1948. The table on the following page shows the financial experience before and after 1948.

The insurance experience since 1948 has been more satisfactory. Insurance operations since that time might be considered as more intensive rather than extensive operations. Congress on several occasions has reviewed the program and has authorized gradual expansion of the number of counties where insurance is offered.

When the legislation was amended in 1947 the Corporation was authorized to reinsure private companies with respect to similar insurance. Since private insurance companies were not writing this kind of insurance, operation of this provision depended upon the entrance of private companies into this field. While there has been some consideration of this by a few companies and some discussions of reinsurance there has been no operation under this provision.

*Summary of insurance operations for crop years 1939-53 as of June 30, 1954*

	Premiums	Indemnities	Profit or loss from sale of commodities	Surplus or deficit
<b>Crop years 1939-47:</b>				
Wheat.....	\$78,617,126.10	\$98,652,635.42	\$12,645,371.22	-\$7,390,138.10
Cotton.....	40,685,456.91	111,568,288.09	-573,664.33	-65,456,495.51
Flax.....	6,162,184.01	4,725,305.60	110,500.00	1,547,378.41
Corn.....	1,193,646.47	1,896,626.08	-----	-702,979.61
Tobacco.....	2,178,064.60	1,563,416.45	-----	614,648.15
<b>Total, 1939-47.....</b>	<b>134,836,478.09</b>	<b>218,406,271.64</b>	<b>12,182,206.80</b>	<b>-71,387,586.66</b>
<b>Crop years 1948-53:</b>				
Wheat.....	63,915,648.23	62,818,826.57	206,043.75	1,302,865.41
Cotton.....	11,928,331.03	14,445,971.21	-----	-2,517,640.18
Flax.....	4,714,886.74	2,962,753.61	-----	1,752,133.13
Corn.....	5,839,697.95	4,264,008.15	-----	1,575,689.80
Tobacco.....	8,004,247.38	7,504,168.13	-----	500,079.25
Beans.....	848,337.91	1,108,750.05	-----	-260,412.14
Multiple.....	10,254,068.56	14,986,170.95	-----	-4,732,102.39
Citrus.....	200,292.97	2,417.55	-----	197,875.42
<b>Total, 1948-53.....</b>	<b>105,705,510.77</b>	<b>108,093,066.22</b>	<b>206,043.75</b>	<b>-2,181,511.70</b>

## CAUSES OF LOSS

Most Federal crop insurance covers essentially all natural hazards. The following table shows the causes of the losses for which indemnities have been paid. Every time a loss is adjusted the adjuster estimates the percentage of the damage due to various causes and the following table is a compilation of that information. For wheat, which was started in the early years, the tabulation shows a longtime picture. For most commodities, the period covered is only 1945-52 and for beans it is 1948-52. The longer the period the less is the chance of the data being unduly influenced by severe losses of some type in one particular year.

*Causes of loss<sup>1</sup>*

Cause	Wheat, 1939-52	Cotton, 1942-52	Corn, 1945-52	Tobacco, 1945-52	Flax, 1945-52	Beans, 1948-52
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Drought.....	45	25	15	29	28	34
Excessive moisture.....	5	27	36	18	35	15
Frost, freeze, snow.....	-----	-----	25	6	9	7
Winterkill.....	15	-----	-----	-----	-----	-----
Hail.....	12	5	5	17	9	34
Insects.....	9	28	-----	-----	4	-----
Disease.....	-----	-----	-----	11	-----	3
Flood.....	-----	3	13	-----	4	-----
House or poleburn.....	-----	-----	-----	7	-----	-----
Miscellaneous.....	14	12	6	12	11	7

<sup>1</sup> The fact there is no percentage shown for some causes does not mean no loss due to that cause but it is small and grouped with the miscellaneous causes.

## HOW IT WORKS FOR THE FARMER

As an example, let us assume that a farmer lives in a county where wheat-crop insurance is available. A sales agent for crop insurance may discuss it with him or this farmer may have heard of the insurance and have asked about it at his county office. If he decides to take the insurance he must make an application for it in writing on a special form. This application for insurance must be submitted before a closing date which is usually a short time before planting of the crop generally begins in the county. After the first year that he takes wheat-crop insurance, he will not have to apply for it again because his insurance contract will continue in force from year to year unless either he or the Corporation decides to cancel it.

In deciding whether or not he wants to take the insurance, he will want to know how much protection it will give him and how much it will cost. This informa-

tion on a per-acre basis is available from the salesman and the official record is available in the county office.

His application for insurance covers all of the wheat in the county in which he will have a share in the crop. He cannot obtain insurance on one farm, for example, and not have it also on his other farms. His application will also contain a promissory note for the premium each year. At the time he makes his application, it is not usually possible to know the exact amount of that premium because he may not know the location nor the exact amount of acreage that he will plant. His request for insurance is reviewed in the county and in the State office and if he is satisfactory, the application is accepted and he then has an insurance contract. He receives an insurance policy setting forth the terms of the insurance contract.

After he has completed planting of his crop he reports the location and amount of acreage that he has planted as well as his share in the crop. This is most frequently done by a visit to the county office although sometimes it is done by mail and sometimes the information is given to a representative who visits the farm. These data provide the basis for determining the amount of premium that he is obligated to pay. He may pay this premium immediately or delay payment until after harvest. Any balance of premiums unpaid by a fixed date (sometimes after usual harvesttime) will be increased by 10 percent.

The farmer is expected to plant his crop and take care of it in a good workmanlike manner as his contract does not cover losses resulting from negligence and poor farming practices. If his crop is damaged so that it is probable that there will be a loss and it is too late to replant it, he must give notice of that fact promptly to his county office. Upon receipt of this notice, his crop may be inspected and definitely will be inspected if he also indicates that the crop on all or part of acreage is so badly damaged that he wants to abandon the crop and put the land to other use, possibly to plant some other crop as a substitute. He cannot without penalty destroy his wheat crop and plant his substitute crop, however, until the inspection has been made and approval given. If any of the acreage remains for harvest, the loss cannot be settled until after harvest, and he is advised to report again about his loss after he has had a chance to harvest the crop and find out more about the production from it.

Most reports of loss are submitted after harvest. The insured farmer is required to keep a record of his production or to keep his production on the farm so that the loss may be determined. An insurance adjuster will visit the farm, measure the wheat that may be stored on the farm, obtain information with respect to the amount that has been sold or otherwise disposed of, and verify it to his satisfaction. He will inspect the fields where the crop was grown and also determine the acreage. The insured farmer will normally submit a claim for indemnity based on these findings, and if the claim is approved, he will receive a check for the amount of his indemnity.

Thus, if a farmer is insured, he does not have any difficult process to follow under his contract. He has to farm, of course, in a workmanlike manner, to report his acreage, to pay his premium, to give notice of damage or loss promptly, and to retain evidence of his production.

#### PURPOSE OF CROP INSURANCE

Before proceeding further into the methods of insuring and operating, it might be desirable to stop and consider briefly the purpose of crop insurance. The farmer's crops are subject to many natural hazards over which he has no control. Often as a result of drought or excessive moisture, of cold or heat, or some other reason, the farmer's crop is lost or severely reduced. Many times the loss of these crops results in financial difficulties even to the extent of having to discontinue farming operations. This is particularly the case where crop failure comes in a series of years, a situation not uncommon and resulting from so-called weather cycles about which we know little. Thus the farmer faces many risks in growing crops.

Insurance is a device designed to meet the problem of risks. Crop insurance spreads the losses over many persons exposed to these risks; it spreads the losses over many areas; and it spreads the losses over many years. It makes it possible for the farmer to substitute a regular annual premium cost for irregular losses.

The farmer has a major investment in his growing crops. With our modern commercial methods of farming, the cash costs alone are high. It takes money to buy fertilizer, seed, gasoline, insecticides, irrigation water, and often labor.

Many farmers have to borrow to put this investment into the crop. Loss of that investment often means inability to repay the loan. This often exhausts his credit, leaving him without means of financing for subsequent years. Crop insurance improves his credit because he can offer it as additional security and use it to pay off his loan if his crop fails. The farmer who does not have to borrow may be in stronger financial position but he risks the money taken from his reserves to produce the crop. If the crop fails, he must dig deeper into his reserves to produce the crop for the following year. By protecting his investment with crop insurance, he can protect his accumulated reserves.

Crop insurance may be looked at not only as protecting the investment but as stabilizing the income. Persons with highly fluctuating incomes who do not build up adequate reserves must adjust their standard of living to their income. This is particularly the case of low-income groups who also often have little ability to borrow. Crop insurance assures them some purchasing power every year.

It is sometimes thought that insurance of crops is needed where losses are frequent but of little need where losses are infrequent. It is not the frequency of the loss that measures the need for insurance; it is rather the amount and importance of the amount that is risked. It hurts just as much to lose the investment in producing a crop if you are one who suffers a loss out of a hundred as if you are 1 out of 10. In fact, where losses are infrequent the insurance protection is quite desirable because the very infrequency of loss makes the premium cost low. It does not make insurance protection unnecessary.

But the benefits of crop insurance extend beyond the farmer. Rural communities are dependent upon farm income for a living. If the farmer can pay his bank loan, his store bill, his doctor bill, etc., and has some money to spend, even though small, stability is added to the income of that rural community. Agricultural income is a factor in national income and any stabilizing factor such as crop insurance has some effect on the prosperity of the country as a whole.

Crop catastrophes have often necessitated Government grants, loans, or other assistance to farmers affected thereby. Crop insurance reduces the need for such public relief measures. It enables the farmer to make provision in advance against such emergencies. It enables farmers as a group to build up through premiums a fund to meet these needs.

#### AMOUNT OF COVERAGE PER ACRE

The amount of insurance per acre differs so widely over the country and for different crops that only general information can be given here with respect to it and something about the method by which it is determined.

The farmer does not have the opportunity to buy any amount of insurance that he may choose, such as is the case within limits for some other kinds of insurance. It is impracticable for a number of reasons for each insured to have a different amount of protection per acre. Consequently, there is generally only one amount per acre available to him although in a small number of counties an option of two amounts is given. Much care is given to the determination of that amount.

There is an important point that should be noted with regard to the amount of coverage per acre. The coverage is essentially a guaranty. Take for example a coverage of 15 bushels. The 15th bushel has the least chance to be produced and therefore is the most expensive bushel to insure. The 14th has a little more chance to be produced and is a little less expensive to insure. The 13th in turn has more chance to be produced than the 14th and is less expensive to insure. Following this reasoning, 10 bushels can be insured for a premium less than two-thirds the premium for insuring 15 bushels, probably for half or less. So while the higher coverages are attractive for the larger protection, the lower coverages are attractive for the lower premium cost.

Since the top part of the coverage is the most hazardous to insure, the Corporation must give much consideration to how high a coverage can be offered under sound insurance. The amount of coverage which can safely be insured for an individual tract of land or land area must, of course, to a certain extent be determined locally. At the same time, it must be subject to control by the Corporation and is in part influenced by legislative controls. The Federal Crop Insurance Act sets two general limits on the amount of insurance. One is that it shall not generally exceed the investment in the crop (per acre) in the general area and the other is that it shall not exceed 75 percent of the average yield

for the farm over a representative period of years. Within these limits set by law, methods have been devised for establishing these coverages, giving consideration to the amount which can be insured with safety, the premium costs, the desires of the farmers, etc.

The process begins at the top. County figures are first developed by the actuaries in the headquarters office based, in part, upon Department of Agriculture statistics with regard to the longtime average yield for the county and statistics from various sources regarding the usual investment in the crop in the area. Often, of course, the amount of premium that farmers in an area are willing to pay is a factor in determining the amount of the insurance coverage. After the figure for the county is established, it is sent to the field underwriter, who, with the assistance of local people, makes such variations in coverage as are desirable between different parts of the county. The basic consideration is the productivity of the land. Yield records, soil maps, and other sources of information are used in dividing the county into areas, some with higher coverages than others. The average of the coverages established for the different areas, weighted by acreages in these areas, cannot exceed the county figure established by the headquarters actuaries.

Through this system, effect is given to the knowledge by local people of the different land areas, to the statistical records of past production, to the amount of premium which it is believed farmers are willing to pay, to the general policies of administration, and to the restrictions in the legislation.

The coverages will also often vary with the farming practice that is followed. Land that is irrigated will usually be insured for more than land that is not irrigated. Land that is summer fallowed will usually have a higher coverage than land not fallowed.

The amount of coverage per acre is not as high on that acreage where the farmer does not complete his crop as it is on the acreage that is harvested. Actually he does not have as much investment in the acreage which is destroyed and never harvested. The coverage is progressive, increasing by stages throughout the season. These stages vary for the different commodities. One set of stages used in quite a few commodities including wheat is that the amount of coverage on acreage released and planted to a substitute crop will be only half as large as it would be if the acreage were harvested. For any other acreage destroyed and not harvested, the coverage would be 90 percent of the full coverage on harvested acreage. In some other crops, for example cotton, a number of stages of production are established but these depend on the processes that have been completed. For example, in cotton the amount of coverage before the first cultivation is 25 percent of the full harvested coverage. After the first cultivation and before laying the crop by, the coverage is 40 percent. After the crop is laid by and until it is harvested, coverage is 75 percent. There are variations for other crops. The above illustrations, however, point to a principle that is involved and which is used throughout the different types of crop insurance.

#### PREMIUM RATES

The processes by which the premium rate for any area of land is determined are somewhat similar. Premium rates are established in most cases as an amount per acre. The actuaries at the headquarters office determine what the average premium rate per acre for the county must be. Field underwriters, with the assistance of local people, divide the county into rate areas. In dividing the county into rate areas and establishing the differentials between areas, consideration is given to the risks of production and crop insurance experience of previous years plays an important part. In this process of classifying the land in the county some of it may be classed as uninsurable. Low land subject to frequent overflow is perhaps the most common case. To avoid having separate area classifications for premium rates and for coverages, the two classifications are consolidated by subdivision of areas so that all land in any designated area, such as area 5, will have the same coverage and the same premium rate. This may necessitate having two or more areas with the same coverage but different premium rates, or vice versa. Final approved coverages and premium rates for areas are set up on a table called the actuarial table and together with the map of the areas they become the official record of the insurance terms for land in the county. They are kept on file in the county office and are available for inspection by farmers. Thus, the establishment of the premiums for an area, like that of establishing the coverage, reflects the knowledge of local people as well as the

statistical record of crop losses and also, of course, is subject to general policy as to the amount of premium.

With regard to the amount of the premium, the Federal Crop Insurance Act provides basic policy. It states that the premium charged shall be such amount as is considered by the Board of Directors to be adequate to meet losses and to establish a reasonable reserve against unforeseen losses. It has been the policy of the Congress, under authorization in the Federal Crop Insurance Act, to provide appropriations for the payment of operating expenses. Consequently, premium rates have been computed on the basis of the amount necessary to cover only the insurance losses and provide reserves. As pointed out earlier, the Agricultural Appropriation Act for the year beginning July 1, 1954, authorized the charging of the direct costs of loss adjusters for crop inspections and loss adjustment against premium income. Consequently, this represents a change in policy with regard to the Government's contribution toward the crop insurance program and the premium that farmers pay.

Another policy that has been followed has been to adjust the premium costs to the risks of the area so that each county and each State bears its own risks. The original rates were based on estimated losses over a representative period of years from records of production but, as time progresses, actual insurance losses are incorporated into the rates so that, for most of the insurance at the present time, the premium rate is largely made up from insurance loss experience.

The risks vary so widely by crops, by areas, and by the amount of the coverage per acre, it is not possible to give any comprehensive picture of the cost of this insurance to the American farmer. For example, county averages for wheat premiums in 1954 varied from less than 60 cents an acre to over \$3, and rate area variations were probably wider. Expressed as a percentage of coverage, county figures varied from 3 to 35 percent. This reflects the fact that there are vast differences in this country with respect to the productivity and risk in growing wheat. In some areas a farmer may receive protection of \$30 an acre for \$1.50 cost, while in other areas a farmer may receive \$9 an acre protection for \$1.50 cost. Wide variations in coverages and rates exist for other crops insured also.

#### SOME INSURANCE FEATURES

In this section an attempt is made to describe some of the insurance contract provisions other than those described elsewhere in this report. This section must in itself be general and limited to the usual practice because it represents a description of eight types of insurance contracts and these vary somewhat even though they have much in common.

##### *Minimum participation requirement*

The Federal Crop Insurance Act requires that insurance not be provided in a county unless applications cover 200 farms or, if less than that, that they cover at least one-third of the farms normally producing the insurable commodities and eligible for insurance. A few counties fail to qualify and some even after having insurance for a year or more drop below the qualifying requirement.

##### *Who may obtain insurance*

Insurance is available only to producers of agricultural commodities. Producers of agricultural commodities are generally owners or tenants. A landlord and his tenant apply for insurance separately and either may insure his share in the crop. In the case of cotton insurance and tobacco insurance, a farm operator may provide the insurance for his share tenants and sharecroppers who farm under his supervision. This insurance must cover all of such persons who share the crop with him. He pays the premium. However, any loss of a sharecropper or share tenant is paid by joint check to both the operator and the sharecropper or share tenant.

##### *Closing dates*

Under each type of insurance or insurance program there are closing dates established after which new applications for insurance in that year will not be accepted. These closing dates precede the usual period of planting and in some cases are considerably in advance of the usual planting dates. The main object of having closing dates (as well as cancellation dates which are explained later) is to get the insurance sold or on the books before much can be known about the conditions for planting and the prospects for the crop. Sometimes the amount of soil moisture or other factors may give a clue as to

the chances for a good or poor crop. Without these date limitations many farmers would take insurance only in those years when conditions for planting and crop prospects indicated less than normal chances for a crop. This is referred to in insurance terms as "adverse selection of risks" and the Federal Crop Insurance Corporation attempts to avoid this by early closing and cancellation dates. A recent illustration of what could happen without these dates is found in the report of a State director in the fall of 1953 about 2 months after the usual planting date for winter wheat. He said, "It has been very dry recently and the wheat crop is at a standstill. Farmers are coming into the county offices now asking for crop insurance on their wheat. One county told me they had at least 50 farmers asking for insurance in the last 10 days." If soil moisture or other conditions become serious before the regular closing date, the taking of applications is sometimes discontinued at an even earlier date.

#### *Continuous contracts*

A farmer has to apply for insurance only the first year. All contracts used are continuous contracts—they continue from year to year unless canceled by the insured or by the Corporation. Cancellation for a subsequent year must be made before a cancellation date named in the insurance contract. This cancellation date is at least 1 month, and usually more than that, in advance of the closing date for taking new applications. An insured who cancels his contract may renew his insurance up to the cancellation date, but he does not have an opportunity to renew it up to the closing date. In most cases there are changes from year to year in the insurance contract and the insured must be notified of these by at least 15 days before the cancellation date. This gives him an opportunity to cancel if he does not like the changes in the insurance.

There are some cancellations by farmers every year and some by the Corporation. Most cancellations by the Corporation result from three causes which are (1) the insured is an occasional rather than a regular producer of the crop, (2) poor insurance risk often evidenced by frequent losses, and (3) failure to pay the premium note. In fact, failure to pay debts owed brings about automatic termination of the contract if the debt is not paid in full by a specified date.

The use of the continuous contract makes it unnecessary to sell all of the insurance every year. From the Corporation's point of view it is the most economical method and in addition adds stability to the volume of business because each year there is a backlog of carryover business. For the farmer it avoids the need of applying for insurance each year and the care needed that this matter is not overlooked. It encourages the practice of carrying insurance every year which is the only way to be sure that you are protected when the loss does occur. These benefits are accomplished by the continuous contract, yet the farmer and the Corporation are committed for only 1 year at a time.

#### *Acreage reports*

One of the most vital requirements of the insurance contract is the requirement that the insured file an acreage report promptly after completion of planting, showing the location and amount of acreage and his share in the crop. This report is the basis for the premium charged and the amount of insurance. The collection of all of these reports made promptly and accurately, is a big feature of the crop-insurance work. The available time for this work is short; many crops have a growing season of 90 to 100 days. To have an unbiased report, the report should be made before the condition and prospects of the crop become known; otherwise, the prospect for the crop may influence the reporting. The human tendency to delay in making this report and the tendency to err in its preparation create many problems.

Persons who fail to report their acreage and interest (or who underreport it) until the crop is damaged, cannot be given the opportunity to rectify the failure or error at that time. To permit this would allow persons to decide on the amount of the insurance after loss became apparent or probable. The contracts provide that if the report has not been made within a specified time, the acreage can be excluded from the insurance by the Corporation and this practice is followed if the crop is damaged. Also, if the acreage or share in the crop is underreported; and this fact is not disclosed or the error discovered before the crop is damaged, the insurance will not be increased. Then if there finally is a loss, the insured is paid an indemnity on a proportional basis, depending on the part that he reported.

Where an insured or applicant desires or is required to pay his premium before he has planted, he submits a report of the acreage he intends to plant to be used as a basis for his premium. He is given the opportunity for a short time after planting to revise these figures. This method of submitting acreage reports is also sometimes used under other circumstances where the prompt filing of the report is necessary before actual planting figures are available.

#### *Replanting*

Part or all of the acreage of the crop may have to be planted more than once, as sometimes the first planting does not produce a "stand." The farmer is expected to replant his crop while it is practical to do so and if he does not, the acreage will not be considered as insured.

#### *Insurance period*

If there is an insurance contract, the insurance takes effect upon the planting of the crop and continues in effect until the crop is harvested, or removed from the field unless this is later than a specified date which is after the usual harvesttime.

#### *Assignment to creditors*

All Federal crop insurance contracts contain a provision whereby the insured may make an assignment to a creditor. In such circumstances if a loss occurs the indemnity for the loss is generally paid by a joint check to the farmer and the creditor who has the assignment. This provision of the insurance contract has helped farmers to improve their credit. It is widely used in some areas while little used in others. In fact, in some areas it has probably been the motivation for many farmers taking crop insurance. Creditors who are given assignments may be landlords, bankers, machinery merchants, etc.

#### *Fired price*

Most of the types of insurance used by the Corporation provide that the insurance for each year shall be based on a predetermined fixed price that year for the commodity. This means that the premium, if stated in physical units, will be converted to dollars on the basis of this price and that any indemnity, computed first in physical units, will be based on this price. As pointed out in the illustration in the introduction, certain types of contracts provide slightly different mechanics. If the amount of the coverage is in dollars, the fixed price is used as a basis for valuing production. In determining this fixed price, the objective is to get as close as possible to the market price for the season when the insured crop is sold. Yet this price has to be fixed considerably in advance of planting time. In many years the legislative basis for support prices on certain commodities has been known at the time and this has been a help in fixing a price for the year for insurance purposes. As of the present time, the fixed price method is used in all except tobacco insurance and citrus insurance, which are described later.

#### *Quality protection*

The insured may suffer a loss in quality as well as a loss in quantity. A loss in quality will generally be reflected in the price at which the product can be sold on the market. There are a number of methods in the different insurance contracts by which this type of loss is reflected in computing the combined loss of quantity and quality. Essentially, these methods are to value the damaged production at a lower value than other production. In the case of corn insurance the fixed price is used to value any of the corn produced that meets or can be made to meet the quality requirements for a Commodity Credit loan but any lower quality corn is valued at the highest price obtainable. For example, if the fixed price of corn is \$1.50 but a farmer's frozen corn is worth only 50 cents a bushel, then the corn would be valued at 50 cents instead of \$1.50. It would take 3 bushels of this type of corn to equal 1 bushel of the corn that would be valued at \$1.50. If the frozen corn is valued at 50 cents a bushel, the value of his total production would be much lower than if his corn were all good quality and of course his indemnity would be higher. In the case of some bean insurance the fixed price for valuing production is not one price but a schedule of fixed prices for the different grades. Thus lower quality production is valued lower.

There are variations from these methods for wheat, cotton, and tobacco.<sup>1</sup> It

<sup>1</sup> See later subsection on tobacco insurance.

should be noted that losses of quantity and quality are not settled separately but are woven together so that production of a high yield will tend to offset loss from poor quality. Loss in quality may hurt the farmer as much as loss in quantity of production, and its inclusion in the insurance protection is important. Quality protection was not given in the early years of Federal crop insurance; it has been added only as workable methods have been developed. There are a few commodities in the multiple-crop insurance for which no quality protection has as yet been provided.

#### *The insurance unit*

The area of land taken into consideration in determining a loss is an important factor. Farmers will have in most years some areas of poor production and some of good production. Looked at from the point of view of that part of the acreage with poor production there may appear to be a loss, while overall there might be little or no loss, the good production in some areas tending to offset the poor production in others. This balancing of good and poor production is more likely to occur on large acreages, and particularly widely separated tracts, where variations in soil, weather, and timing of operations may cause differing crop results.

Since the area taken into consideration in determining a loss is so important with respect to the amount of loss (or even the existence of any loss) this area has to be defined in the insurance contract and is known as the insurance unit. While there is some variation in the different kinds of Federal crop-insurance contracts, the most common basis is as follows: (1) All the acreage in the county in which an insured has 100 percent interest in the insured crop is one insurance unit. (2) All acreage in the county owned by the insured and rented to one share tenant is an insurance unit. (3) All acreage in the county owned by one person and operated by the insured as a share tenant is an insurance unit. (4) In the case of cotton insurance, a sharecropper's acreage is a separate unit, as far as his insurance protection is concerned.

Because the area of the insurance unit is so important it has been a subject of much controversy since the beginning of the insurance. In the early years of Federal crop insurance the farm was generally the insurance unit. Acreage that constitutes a farm is often very difficult to determine. Farmers often have tracts of land that are separated, and these may have been separate farms in the past, but with modern movable machinery these tracts may be operated as one unit. To attempt to break them down for insurance purposes, as was done in the early years of the insurance, tends to move in the direction of field insurance.

It may seem inconsistent with this combining of countywide operations into one unit to make separate units on the basis of sharing the crop with different people. Probably the most important reason for this is to provide both the landlord and the tenant with the same basis for determining loss. An illustration may help to explain this: Suppose that A owns and operates a farm and also rents some additional land from B. B's only land is the land rented to A. If both A and B were insured, and there was a loss on the rented tract, A and B, under the present system, would receive similar indemnities, varying only with their percentage share in the crop. However, if all of the land farmed by A was one unit, it is conceivable that good production on his own land would offset the loss on the rented land, so there would be no indemnity paid to him but there would be an indemnity paid to B. In that case, A probably would be a dissatisfied insured.

The present definitions of an insurance unit are certainly not entirely satisfactory. Still, at the present time they seem to be the best compromise basis to meet the various objectives.

#### ADJUSTMENT OF LOSSES

The adjustment of losses is extremely important. Properly carried out, it can contribute to a workable system of insurance. Improperly carried out, it alone can bring about failure for the system.

The adjuster's duties are many, and his methods are varied. Early in the season he has to inspect damage and often decide whether or not to release the acreage. He makes some inspections throughout the season. After harvest he has to adjust the losses. In doing so he must determine that the loss occurred from a cause insured against and not for some other reason such as poor farming practices. He has to determine the acreage often requiring measurement. He has to inspect the acreage to see that it was harvested properly and

to see if there is any evidence of lack of care. He may want to compare the results from the insured farm with those of adjacent farms and he may want to make other inquiries. He has to appraise any production left in the field or unharvested. He has to determine the production that was harvested.

In determining production the real problem is to find all of it since failure to account for all of it means overpayment for the loss. The adjuster usually measures the harvested production stored on the farm and gets records of sales. But this alone is not enough. Some of the production may have been fed to livestock before he arrived. Sometimes part of it may have been sold to an undisclosed buyer or delivered to a different place. Occasionally the farmer fails to report it all unintentionally; there are occasions where the farmer does not report it all intentionally. It is the adjuster's job to be certain that nothing is overlooked and to satisfy himself that he has found the total production.

The adjuster's work requires much skill and judgment. Adjusters are farmers or persons who have been farmers. This is the basic knowledge. When first hired they are given training in the crop insurance and methods of adjusting. Sometimes an adjuster serves only 1 county but it is also common practice to use them over a territory larger than 1 county. Their work is supervised and spot checked. Only by experience does an employee become a good adjuster. The Corporation has many adjusters who have performed this work for years. As ability is developed, they are usually given greater responsibilities, such as training and supervising new adjusters, handling especially difficult cases, making investigations, working over wider territory in their own State and sometimes temporarily in other States.

#### THE PREMIUM

In submitting an application for insurance, the farmer signs a note agreeing to pay the premium each year. In certain instances, payment on an estimated basis is required or perhaps a cosigner may be required on the note. After the acreage report is submitted, the premium for the contract is computed and the insured is billed for the amount.

The premium rate is based on land characteristics and is applicable by areas but a farmer's ability and farming habits also have an effect on the chances for loss. To reflect this in the premium cost to the farmer, a discount is given for good experience. Two methods are used. One provides that if a farmer has had insurance for 7 consecutive years without a loss that he will have a 25-percent reduction in premium. Associated with this is an alternative provision in some types of insurance which provides that when the premiums paid by a farmer on crops insured continuously year after year exceed indemnities paid to him by an amount as large as the full coverage on the crop, he will have a reduction of 25 percent in the premium. (In the case of wheat, it is 50 percent.) This provision is an alternative to the one described above for 7 years without a loss; both are not given together.

In some of the insurance a discount is given for large acreage in an insurance unit. This is to recognize in some measure the greater diversification of risk that tends to exist on large acreages due to greater variations in topography and soils and to different weather at different locations. Many of the larger acreages insured are often in separate tracts and this increases the diversification of risk.

Numerous things are done to effect the collection of premiums. Farmers are billed for the premium as promptly as possible. The billing represents a discounted premium and any premium not paid by the discount date (near the end of the season) is increased by 10 percent. The premium can often be deducted from payments made to farmers for commodity loans or conservation payments. If a farmer doesn't pay for his insurance he is unable to get insurance in subsequent years. Interest is charged on unpaid balances. When other methods fail a farmer may be sued for the premium. The proportion of premiums that finally fail to be collected is small.

How much premium does a farmer pay? The average for the country in 1952 was \$75.65. But there is a wide variation between farmers and even between areas. Generally in the eastern part of the country where the farms are smaller and risks are lower, the premiums are smaller than in the West. The average tobacco insurance premium for Tennessee was \$13.39 in 1952 whereas the average wheat premium in Montana was \$544.71; these figures are near the extremes rather than representative of the eastern and western parts of the country. There is a minimum premium charge which is \$10 on some crops and \$5 on others.

## DEVIATIONS FOR MULTIPLE-CROP, TOBACCO, AND CITRUS INSURANCE

*Multiple-crop insurance*

The multiple-crop insurance is a type in which insurance protection is offered on a group of crops rather than a single crop. In each county where this insurance is offered, certain specified crops are insured. An insured is covered on any of these that he plants in the county. His coverage for all these crops is combined and if the value of the production (based upon fixed prices) of all these crops combined is less than the combined coverage an indemnity is due. This then combines the risk on a number of crops, such for example as wheat, corn, soybeans, oats, and potatoes. Since these crops are in part subject to different risks, and good production of one will offset poor production of another, the loss on the combined crops usually is less than the sum of the losses on separate crops. For this reduction in risk carried by the insurance the farmer receives a reduction in his premium for diversification of risk. The object is to provide more complete insurance for the farm operations as a whole.

There has been substantial demand for an option whereby losses would be determined and settled separately on each crop. This is being tried in two counties on the 1954 crops and will be tried in a number of counties on 1955 crops. The premium cost to the farmer for this type of insurance will be much higher than for the regular multiple-crop insurance because the reduction of premium for diversification of risk as described in the preceding paragraph will not apply.

Many different kinds of crops are insured somewhere under multiple-crop insurance. In 1954 there were 38 different crops insured although some of them were insured only in one county. The names of the various crops being insured are shown below:

**Grains:**

Barley  
Corn  
Grain sorghum  
Oats  
Rice  
Rye  
Wheat

**Foods:**

Beans (dry edible)  
Cabbage  
Corn, sweet  
Eggplant  
Onions (dry)  
Peas (canning)  
Peppers  
Potatoes, Irish  
Snap beans  
Sugarcane  
Sugar beets  
Sweetpotatoes  
Tomatoes

**Oil:**

Flax  
Soybeans

**Seeds:**

Alsike clover  
Crimson clover  
Lespedeza  
Red clover  
Ryegrass  
Vetch

**Hay:**

Alfalfa  
Clover  
Lespedeza  
Red clover  
Tame hay  
Vetch

**Other:**

Cotton  
Tobacco  
Corn ensilage  
Sorghum ensilage

*Tobacco insurance*

Quality is an extremely important factor in the production of tobacco. The loss from poor quality may be far more important than the loss in quantity, although both types of losses are often found together.

In the insurance of most other crops, production is valued at a fixed price except in the unusual case where some factor has materially damaged the quality. The tobacco crop off any acreage normally consists of tobacco of varying quality with a wide range in value. Most tobacco is sold in an auction market where bids are made on each basket. The price at which the tobacco is sold reflects in large measure its quality. Some baskets may sell at 10 times as much per pound as others. Under these circumstances a single fixed price per pound would not be very satisfactory for insurance purposes. So in tobacco insurance the production is valued at the price it is sold (with minor exceptions). Thus if the general quality of a farmer's crop is unusually low—perhaps an unusually large proportion of low grades—this poor quality will be reflected in the price at which it is sold and consequently in the indemnity.

While the price at which tobacco is sold is related quite closely to the quality, it also is affected by the level of the general market price for tobacco of that

type. To exclude payment of indemnity for decline in general market values—not quality factors—several methods are used. Under one method the coverage is established at the beginning of the growing season only in pounds; it is converted to a monetary coverage after the marketing season is over on the basis of an average market price for that type of tobacco. This may be an approximate figure determined before the markets are closed. Thus if a farmer's coverage were 1,000 pounds the coverage in dollars at an average market price of 40 cents would be \$400. If he produced 1,000 pounds and sold it in the auction market for \$300 his loss under insurance would be \$100. This loss was due to the fact that his tobacco sold for 10 cents a pound under the market average for that type of tobacco and was probably due to poor quality although certain other factors may be involved. Had he produced less than 1,000 pounds and sold it at an average price of 30 cents his indemnity would have been larger and due partly also to loss in quantity.

The plan described in the preceding paragraph was the first one used in tobacco insurance. Later to meet the desire for a coverage fixed in dollars at the beginning of the season a different plan was used in some counties. The coverage was set in dollars at the beginning of the season but was low so as to minimize any price risk. This was originally named "investment insurance." A more recent modification has been to provide a higher level of such insurance (expressed in dollars at the beginning of the season) but with a provision that if the average market price should turn out to be lower than a price considered in setting the coverage that a somewhat parallel reduction would be made in the amount of coverage.

Since tobacco losses cannot be determined until after the insured tobacco is sold and after the general average market price can be determined, it is obvious that adjustment of losses cannot be performed immediately after harvest as for other crops. In fact the production process for tobacco does not end upon harvest. The green tobacco plants or leaves are hung in the barn and are cured by air or by the application of heat. Insurance on other crops terminates upon removal from the field, but insurance on tobacco continues while in the barn.

There are some other differences between the tobacco insurance and insurance for other crops, but the above are the major differences.

#### *Citrus insurance*

Citrus insurance is a relatively new experiment now in its third year and is confined to two counties in Florida. This is the Corporation's only insurance of tree crops. Insurance of tree crops presents some different problems than insurance of field crops. Several features made it undesirable to attempt to insure citrus under the usual plan for field crops. In the first place, the potential production of the citrus tree varies with its age and this would create a problem in establishing coverages related to the productivity. At present in field crops the coverage is established by areas and such would be impossible with citrus because of the varying age of the trees. Another difficulty is the fact that the productivity of the trees varies not only with the care given to them during the current year, but with the care given to them during preceding years and even as a result of damage from weather in previous years.

Since the citrus people involved were primarily interested in protection against hurricane and freeze, it seemed desirable to limit this insurance to a few specific risks. These include hurricane, freeze, and hail, the hail being a relatively minor risk. Loss is determined on the basis of the percentage of damage to the crop. This is possible because the citrus fruit is in existence on the tree before these hazards occur. The hurricane season, for instance, begins in late July or August. It is then possible to tell what percentage of the fruit are blown off the trees. This situation is quite different than insuring a wheat crop against drought where the wheat may never make a "stand." Under such circumstances it is not possible to use the percentage-of-damage method.

Since citrus insurance covers only three specific risks and there are years when none of these risks materialize into damage, it is to be expected that there will be years with no losses at all and probably other years with serious losses. While this is occasionally the case with field crops under the general all-risk policy, it is the exception rather than the rule. Thus in citrus insurance, even more than in all-risk insurance for field crops, the insurance function is primarily the distributing of losses over a period of years.

## SOME GENERAL ASPECTS

Before completing this description, a few general comments might be helpful to cover certain gaps in the preceding description and possibly to clear up some wrong impressions which the reader might have obtained.

Most of the crop insurance is not applied for by farmers coming into the office to ask for it. It is sold by salesmen. There is an expression in the insurance world, "Insurance is sold—not bought." Perhaps this is because insurance is protection for the future, and for most of us the problems of the future are outweighed by the problems of the present. When some situation arises such as a prolonged drought and shortage of soil moisture many farmers would, of their own accord, apply for insurance if it were available at the time. But under ordinary circumstances, most of the crop insurance has to be sold by actual solicitation of the business.

While there are approximately 400,000 farmers carrying Federal crop insurance, there are not an equal number of independent separate risks. The same catastrophe that affects one farmer will often affect many. The drought that strikes the southwest plains area affects the wheat crop of many insured farmers. The heavy boll-weevil infestation that affects one cotton farmer will affect many farmers. It is true there are circumstances on individual farms that may cause losses and there are local weather factors such as showers that affect small areas, but on the whole there are far fewer risks in number than the number of policy-holders.

Because of the fact that crop insurance is subject to widespread crop catastrophes, it is the very nature of the insurance that in some years the losses will be much heavier than in others. In some years there will be a deficit; in others, a surplus. This is shown by the table of loss ratios that follows. The loss ratio is the ratio of indemnities to premiums and indicates what part of the premium was needed to pay indemnities. In years with loss ratios below 100 some surplus is built up. In years with loss ratios over 100 there is a deficit. This is well illustrated by the corn experience as shown in the table. In 4 of the 6 years the losses took only one-fourth or less of the premiums. But in 1951 losses were very heavy. Over the 6-year period with an average loss ratio of 0.73 there was some surplus.

*Loss ratios, 1948-53*

Program	Crop year						
	1948	1949	1950	1951	1952	1953	1948-53
Wheat.....	0.58	1.45	0.51	1.06	0.85	1.25	0.98
Cotton.....	.43	1.97	2.80	.82	.44	1.04	1.21
Multiple.....	.06	.16	.93	1.65	2.33	.91	1.46
Tobacco.....	.43	.66	.61	.49	.79	1.90	.94
Corn.....	.17	.16	1.23	2.38	.25	.17	.73
Flax.....	.51	.62	.41	.49	.79	.95	.63
Bean.....	.29	.64	1.81	3.14	.55	.62	1.31
Citrus.....				0	.04	0	.01
All programs.....	.53	1.32	.90	1.12	.97	1.15	1.02

Although the tendency to surpluses in some years and deficits in others is most pronounced on individual crops (programs), it should be noted that it also exists for all programs combined. This makes it very difficult to evaluate the success of crop insurance by the surplus or deficit from operations in any 1 year, or even in a short period of years. A deficit in a single year, instead of reflecting failure of the insurance from a financial viewpoint, may actually reflect the fact that it is functioning properly.

One should not get the impression that the crop-insurance program is uniform throughout the country, an impression that could be gained from a brief description such as has been given herein. The operations are marked by wide diversity, not only between different areas of the country but even between adjacent counties. There are counties where practically all farmers are insured, at least more than 90 percent of them. There are other counties where only 5 to 10 percent of the farmers are insured. There are counties with less than 100 contracts and counties with more than 2,000 contracts. There are farmers who

pay a premium of only \$5 and others who pay thousands of dollars. There are areas where the risks are exceedingly low and there are areas where the risks are exceedingly high. There are areas where heavy deficits have been incurred over the years and also areas where large surpluses have been built up. Thus one should not form the impression from the description that has been given that Federal crop insurance is the same in all places.

It should be kept in mind that the Federal crop-insurance program is one which is still experimental and developing. While there are more than one-third of a million farmers insured and the successful carrying out of this insurance is an important end in itself, the objective of developing a sound workable insurance for wider use in the future is of equally great importance. The various types of insurance differ with respect to the extent to which they are approaching this goal. Wheat insurance, for example, covers the majority of the heavy wheat-producing counties. The premium volume for wheat represents more than half of the Corporation's premiums and consequently, the total experience in the aggregate is greatly influenced by the wheat-insurance experience. On the other hand, the multiple-crop insurance is still very much experimental.

Also, one should not get the impression that progress toward these goals is accomplished steadily. There is progress, and then sometimes there are setbacks. A lot of insurance may be sold in a county in some years and then for some reason or other, the volume of business may decline. Progress therefore must be looked at from the longtime trend as there are temporary variations.

#### CONCLUSION

The purpose of this writing has been to describe Federal crop insurance, to give the reader a clearer picture of what it is and how it operates. The problem of what to include and what to exclude has been difficult because there are many aspects of the insurance and many factors which are of varying importance in the different parts of the country and for the different crops insured. Intended as a description, it intentionally contains little analysis or evaluation.

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The recent experience of Federal Crop Insurance Corporation was set forth so explicitly in the Corporation's 1954 report to the Congress that it bears repetition here.

#### FEDERAL CROP INSURANCE CORPORATION'S REPORT TO CONGRESS, 1954

More than any year since 1947, when the Federal crop-insurance legislation was changed to reduce the scope of operations and emphasize development of a sounder basis for offering all-risk insurance of the money spent by a farmer to produce a crop, it is important to present the picture of crop conditions which the insurance program encountered in 1954.

Crop insurance was initiated by the Government beginning with the 1939 crop year to provide a businesslike method of cushioning the shock of crop disaster for the immediate victims—the farmers whose crops are lost through no fault of their own—and the business communities dependent directly or indirectly on the money spent by farmers. Such protection against the full shock of crop failures intends that insured farmers will finance through premium payments the insurance indemnities paid to policyholders who lose all or part of their crop investment due to natural hazards beyond their control. The ultimate objective of crop insurance is to reach a self-sustaining status under which premiums will cover the entire cost of operating the program. There are still many problems to be solved in this high-risk insurance field before the goal of paying losses, building adequate reserves, and paying operating costs from premium income can be attained.

The current volume and distribution pattern of crop-insurance business is such that when widespread crop loss occurs in both the winter and spring wheat areas, where the insurance liability is heavily concentrated without an adequate offsetting in other crops and areas, indemnities will inevitably exceed the year's premium income. The insurance experience in 1954 reflects the experience to be expected in such a year.

In 1954 the Corporation paid losses to farmers who suffered severe crop failures of slightly over \$28,500,000 compared to its earned premiums of about \$23 million. The 1954 experience reflects crop conditions that reached disaster proportions in several areas in which the concentration of the Corporation's business is out of line with its total volume from a sound insurance under-

writing standpoint. It emphasizes some of the problems that must be met in order to reduce the insurance loss ratio in similar years in the future.

#### 1954 CROP CONDITIONS

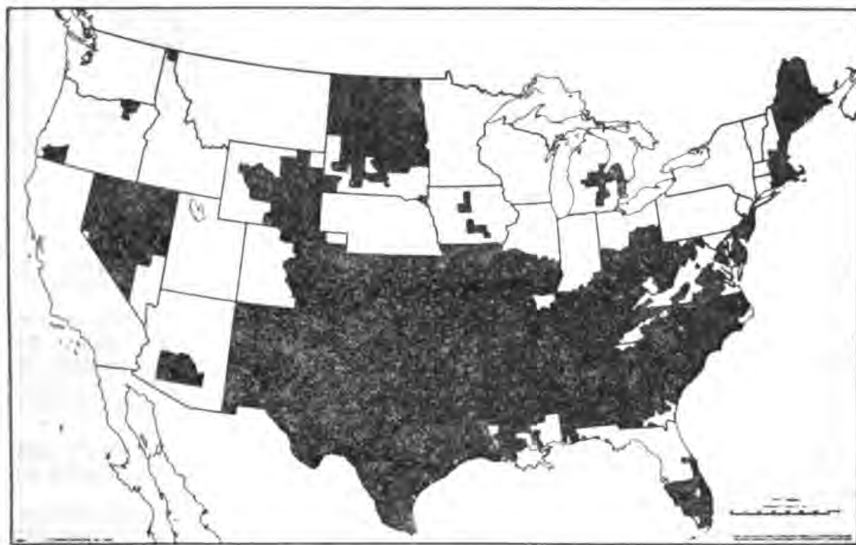
The crop conditions which prevailed over large areas in 1954 must be recognized for proper evaluation of the 1954 insurance experience.

The drought conditions described in the Corporation's 1953 report extended over an expanding area in 1954. There is real concern that drought may continue to parch many of these areas again in 1955 and perhaps expand over an even larger area as it has in previous weather cycles. Some weather experts are predicting that it may be as late as 1960 before the prolonged drought conditions are effectively broken.

This was the fourth successive year of serious drought losses under the crop-insurance program. During this period the Federal Crop Insurance Corporation has paid \$100 million of indemnities to insured farmers whose insured crops were destroyed or very severely damaged. More than 90 percent of this total came from premiums paid by farmers for all-risk insurance protection.

The widespread financial distress among farmers due to crop conditions in 1954 and the preceding years is illustrated by the following map.

1954—EMERGENCY ASSISTANCE AREAS



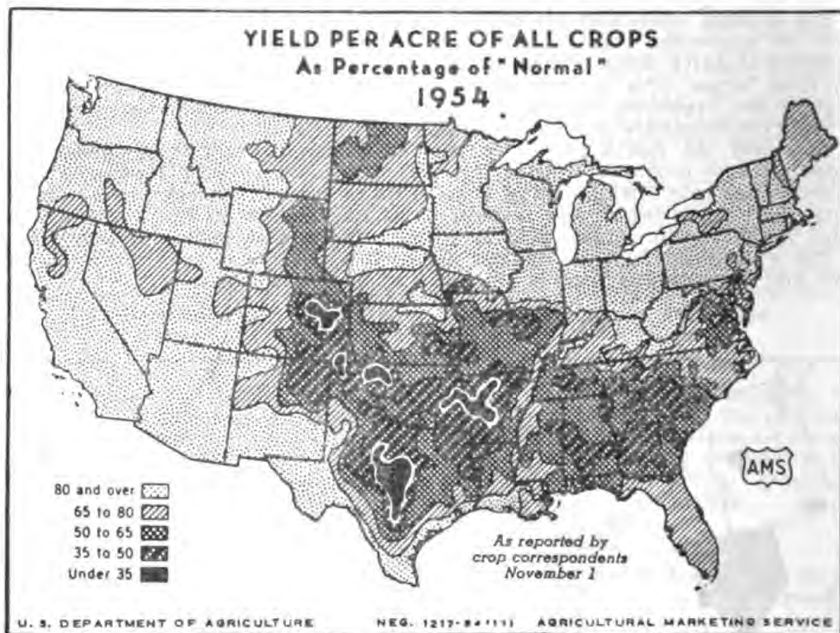
This map was prepared from information furnished by the Farmers' Home Administration regarding the extent to which emergency assistance was made available by the Department to meet the serious problems resulting from prolonged drought in many areas; heavy rains or floods in Arizona, Florida, Idaho, Michigan, and Iowa; hurricanes extending from North Carolina to Maine; early frosts in Oregon; and rust and other adverse conditions in the Dakotas.

Emergency loans are made in counties designated as disaster areas to assist those farmers and ranchers who have suffered substantial production losses and are unable to obtain credit they need from private sources. The hay distribution and feed grain programs under specified conditions make available Federal funds to pay a part of the costs of transportation of hay to drought areas and to provide surplus grain at a reduced cost to farmers and ranchers who need help to maintain their foundation herds.

The extent of distress is illustrated by this map which shows 1,721 counties in 36 States—more than half the Nation—designated as emergency loan areas at sometime during the 1954 crop year. There were 999 counties in 18 States that qualified under the hay distribution and feed grain programs, with most of these counties also designated under the drought emergency loan program. Of the 1,721 counties designated as emergency loan areas, approximately 95 percent were originally designated because of drought. At least one of the emergency

assistance programs operated during 1954 in the dark areas on the map. This illustrates the widespread nature of emergency crop conditions which the insurance operation encountered in 1954.

The odds against the Corporation's premiums being adequate to covers its claims in 1954 are illustrated by the Agricultural Marketing Service map below which shows the 1954 yield per acre as a percentage of normal.

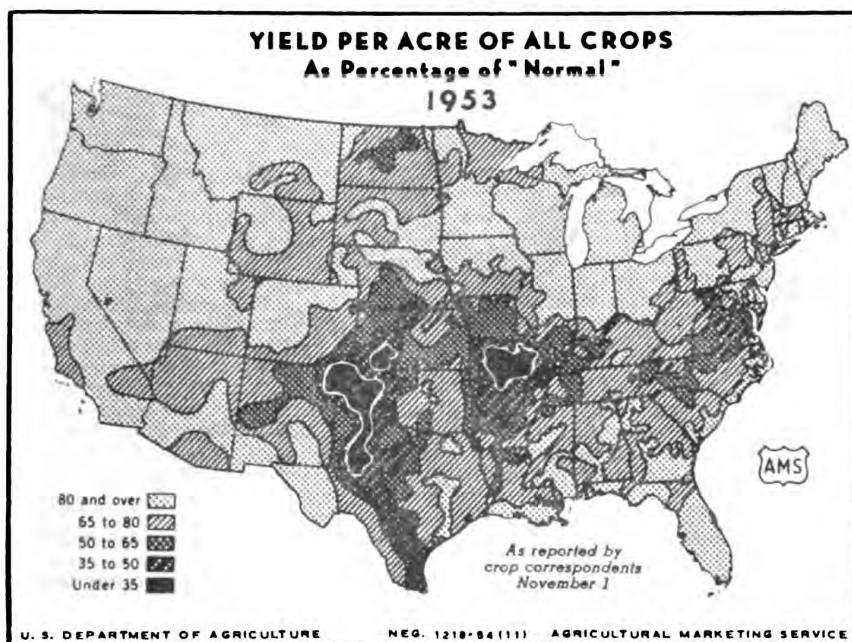


From the standpoint of the insurance experience, it is interesting to compare the map above with a similar map for 1953 when premiums failed by nearly \$4 million to cover the indemnities paid due to heavy drought and rust damage in wheat and severe tobacco losses due to drought. It will be noted in comparing the 1953 map which follows with the 1954 map that there is an expansion in 1954 of the dark areas which show conditions below 65 percent of normal.

The report which included these maps stated that "drought in the South and Southwest and stem rust in the spring wheat areas were the chief obstacles to realization of the continuing trend toward higher yields."

It is significant in connection with the Corporation's 1954 insurance experience that some of its heaviest concentrations of business are in the areas hardest hit by the drought and rust. The insurance experience does not yet have the benefit of the equalizing that takes place in the Nation's overall production results since it operates on a limited scale with an uneven spread of its liability over different areas and crops. Adverse conditions in areas where insurance business is heavily concentrated cannot be offset by premiums from other areas and crops with the present volume and distribution of the Corporation's business.

The spread of the insurance risk is not yet wide enough to make general crop conditions and production from a national standpoint a reliable guide to the experience of the Corporation. The conditions that prevail in the crops and areas in which the Corporation's business is currently concentrated naturally are the major determining factors in its overall experience.

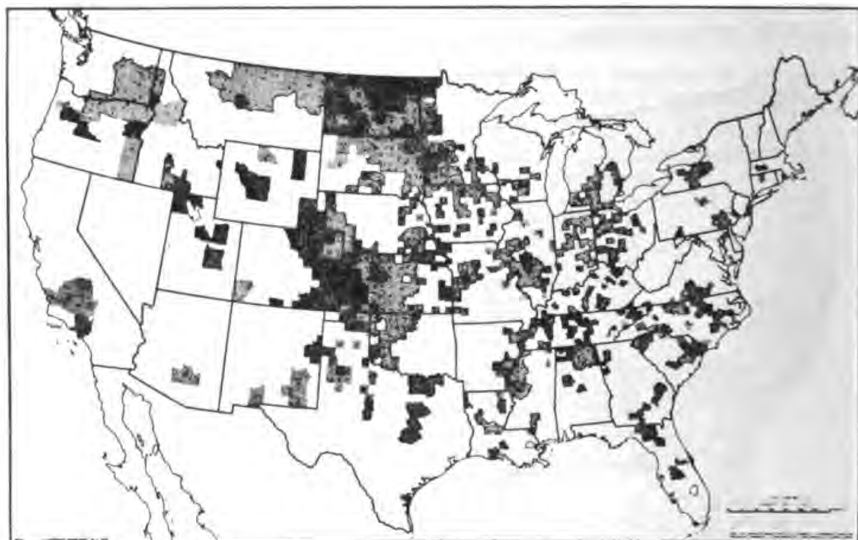


#### THE 1954 OPERATING EXPERIENCE

In view of the crop conditions encountered by the insurance operation in 1954 and its vulnerable position from the standpoint of the spread of its risk, the 1954 experience can be regarded as encouraging. The purpose of insurance is to pay disaster losses. Certainly the Corporation filled that role in 1953 and again in 1954. It is unfortunate from the overall experience standpoint that reserves had not been accumulated from premiums in other years to fully cover the heavy losses paid in these 2 years. Until there is more premium income and wider spreading of the risk, it is to be expected that in years of severe crop disaster in major insurance areas indemnities will exceed premiums. Such years will show whether progress is being made toward a sounder insurance operation. This is evident from the 1954 experience since the margin between indemnities and premiums would have been much greater in the past under similar crop conditions.

The prolonged drought which held an expanding area in its grasp during 1954 threatened considerably heavier losses than those now recorded. In many insurance counties bordering those hardest hit, farmers harvested short crops that generally were slightly above their insurance coverage. Losses in these areas would have been very heavy under the higher coverages offered in the earlier years of the insurance program.

The map below serves a dual purpose. It shows the location of the counties in which the Corporation offered insurance in 1954 with the dark counties those in which the premiums were not sufficient to cover all indemnities.



It will be noted that the areas where indemnities exceeded premiums follow closely the crop conditions illustrated by the earlier maps. However, a severe loss on a single crop insured in a county is not always reflected in such a comparison since the condition of other crops may bring the percentage of "normal" into a more favorable category than production from the single crop would indicate.

Wheat largely tells the story of the 1954 insurance experience. This is to be expected under the current volume and distribution of business. Wheat insurance accounted for 40 percent of the 1954 liability, 57 percent of the premium, and 66 percent of the indemnities paid. Drought again devastated winter wheat in the Southwest Great Plains and extended northward while rust damage in North Dakota, particularly in durum wheat, was very severe. Rust has dealt the North Dakota wheat operation a severe blow for 2 successive years. The 1954 wheat indemnities will approach \$19 million compared to premiums of nearly \$13 million. Indemnities in North Dakota will total nearly \$8 million on wheat with an additional \$1,637,000 on multiple largely due to wheat losses. The experience of this State in 1953 and 1954 is in sharp contrast to prior years when its policyholders had been steadily building reserves against such disastrous loss years. Drought indemnities in Colorado added more than \$3 million to the wheat total with New Mexico, Texas, Utah, and Wyoming also showing high loss ratios. Indemnities exceeded premiums in Kansas and Nebraska.

It will be noted from the loss ratio table below that the 1954 wheat loss ratio was the highest for the period since 1948 and that without exception when wheat indemnities have exceeded premiums the total experience of the Corporation has been the same.

*Loss ratios, 1948-54*

Program	1948	1949	1950	1951	1952	1953	1954	1948-54
Wheat.....	0.58	1.45	0.52	1.06	0.85	1.25	1.46	1.06
Cotton.....	.43	1.97	2.81	.82	.44	1.04	.64	1.15
Multiple.....	.06	.16	.94	1.65	2.33	.91	1.42	1.45
Tobacco.....	.43	.66	.61	.49	.79	1.90	.93	.94
Corn.....	.17	.16	1.26	2.38	.25	.17	.69	.72
Flax.....	.51	.62	.42	.49	.79	.95	.77	.65
Bean.....	.29	.64	1.84	3.14	.55	.62	1.53	1.35
Citrus.....				0	.04	0	0	.01
All programs.....	.53	1.32	.91	1.12	.97	1.15	1.26	1.06

It is interesting to note in this connection that the Corporation's 1952 Report to Congress included a summary of the wheat operations from 1939 through 1952 which showed that, although premiums had exceeded indemnities each year for the first 5 years, the wheat experience had improved and was only \$2 million short of total premiums earned balancing with indemnities paid since the start of the program.

The 1.42 loss ratio for multiple crop insurance was nearly equal to wheat and represents about \$4,600,000 of losses compared to \$3,200,000 of premiums. Drought, rust, and shortage of irrigation water were the main factors in the unfavorable multiple experience. North Dakota accounted for over \$1,600,000 and Colorado \$1 million of these losses. Loss ratios were very high in Wyoming, Utah, Tennessee, Texas, Missouri, Louisiana, Kansas, and Illinois.

The only other program with indemnities exceeding premiums was beans with a 1.53 loss ratio due chiefly to freeze in Idaho and hurricane damage in Michigan.

Drought, hail, and hurricane pushed tobacco losses up to 0.93, which was the highest loss ratio for tobacco for any year except 1953, when the heavy drought losses caused this program to show a deficit for the first time. Drought was the major factor in a 2.45 loss ratio in South Carolina and 1.79 in Georgia. Several other tobacco States required nearly all of their premiums to pay indemnities.

Cotton came through with a 0.64 loss ratio, although short crops in several insurance areas made it appear that losses would be higher prior to harvest.

The 0.69 loss ratio for corn included only 2 States with indemnities exceeding premiums—Illinois with 2.26 and Missouri with 2.85.

Flax went through another favorable year with a loss ratio of 0.77. It will be noted from the table that flax premiums have exceeded the indemnities paid each year. Minnesota's loss ratio was 1.12.

The 1954 citrus program in the two Florida counties has escaped without loss despite the tremendous damage caused by hurricanes along the eastern seaboard. The period of risk under this program is not over. Under this plan of insurance against hurricane, tornado, freeze, and hail, it is expected that losses will either be negligible or very heavy, so it is important that reserves be accumulated against future disaster years.

The following table gives a concise summary of the 1954 crop insurance experience by programs:

Program	Number of county programs	Number of farmers insured	Total premium	Total amount of protection	Total indemnities	Loss ratios
Wheat.....	402	135,697	\$12,962,831	\$144,027,210	\$18,880,145	1.46
Flax.....	53	23,451	938,977	8,575,264	718,936	.77
Cotton.....	101	33,499	1,486,122	28,394,837	890,745	.64
Corn.....	99	32,673	1,358,345	29,432,576	887,983	.69
Tobacco.....	107	96,579	2,351,410	70,634,250	2,095,061	.93
Bean.....	24	6,352	194,723	3,422,059	246,956	1.53
Multiple Crop.....	96	41,042	3,229,857	68,572,512	4,583,417	1.42
Citrus.....	2	407	98,472	1,513,914	-----	-----
All programs.....	884	369,700	22,620,737	354,572,622	28,303,243	1.26

The final figures on 1954 experience will show some adjustment from the premium and loss figures in the table. The loss figure may be somewhat lower or higher since some tobacco losses are still to be adjusted and several thousand claims remain to be paid on other crops due to the workload which the heavy loss situation placed on available personnel. The premium figure could be somewhat higher since it does not include the 10-percent increase in premiums which are not paid by the discount dates.

The 884 county programs shown above operated in 803 counties since more than 1 commodity is insured in some counties under separate policies.

The number of farmers insured includes nearly 23,000 sharecroppers who were protected in 1954 under combination contracts in tobacco and cotton under which the operator insures all of his sharecroppers under one contract. This new combination contract enables the Corporation to carry more business under fewer contracts. Many individual contracts were combined under these contracts in 1954, and additional progress in this direction is expected in the future to simplify the handling of insurance in these counties and reduce the administrative costs involved.

In 1954 considerable attention was given to eliminating from the Corporation's business policies on which there was no premium earned and others on which only a token amount of premium was earned. This was accomplished through cancellation of contracts where no acreage was reported and establishing minimum premiums.

The reduction in premium income from \$27 million in 1953 is due chiefly to the allotment programs which reduced the acreage insured in 1954 under many policies below the 1953 acreage. Wheat premiums, for example, dropped from over \$16 million in 1953 to about \$13 million in 1954. Tobacco premiums increased by more than 15 percent, and flax premiums were up about 14 percent. In the case of multiple-crop insurance the premium income is somewhat less than in 1953, but experience indicates that the Corporation should proceed slowly until the soundness of this plan of insurance can be improved.

There is shown at the end of this report a tabulation summarizing by programs and years the experience accumulated during the years 1948 through 1954. Since in any single year some unusual situation may develop which would cause the experience to appear especially favorable or unfavorable, this tabulation should prove helpful in evaluating operating results during this 7-year period.

#### STRENGTHENING CROP INSURANCE OPERATIONS

There are numerous problems to be solved and improvements to be made in crop insurance operations in the years ahead in order to place the program on a sound insurance basis. From an insurance standpoint, there is only very limited experience to guide the way, and experimental work must be continued in order to find the logical answer to many of the problems that currently exist and others that will develop in the future.

Progress is being made in improving the insurance operation, and through study of current problems and past experience plans for accelerating this progress in the future are being developed.

#### *Spreading the insurance risk*

The 1954 experience emphasizes the reason for the grave concern of the Board of Directors regarding the concentration of the insurance risk that had developed prior to its appointment. It is an established principle of insurance that the risk must be spread. Instead of an adequate spreading of the risk, the Board feels that the Corporation has a dangerous concentration of risk at the present time and that wider spreading of the risk should be effected as rapidly as possible.

To assist in a wider spreading of the risk, insurance on soybeans will be started in 1955 and on barley in 1956. Change in corn insurance will also be tried with the aim of major expansion in the volume of business in the commercial corn area within the next few years.

The multiple program appears to have been expanded too rapidly and is now in need of major improvement. It has proved much higher risk than the original estimate regarding the offsetting of risk that would result from insuring several crops under a combined coverage. Safeguards necessary to properly adjust losses are complicated and expensive at present. Farmers who have lost one or more of their insured crops without being due an indemnity under the contract generally claim that they would prefer insurance that indemnifies them for individual crop losses even though the premium might be considerably higher. Consequently, the Corporation is testing a plan in some of the multiple counties which provides an optional individual crop settlement. This plan will increase the premium income from these counties and may prove to be the answer to some of the difficult problems which face the Corporation in connection with this program.

#### *Sales must be stopped when risk is high*

Obviously, a sound insurance operation will not increase its liability when unusual risk conditions develop. In the past the Corporation followed a policy of establishing closing dates for the filing of new applications and permitted sales to continue until these dates regardless of the risk that developed. The records show that very heavy losses have been paid in several instances in the past because farmers were allowed to obtain crop insurance even though losses could be expected due to adverse conditions. The Corporation has reversed this policy and put farmers on notice that new business will not be accepted when conditions indicate that the risk of loss is unusually high. Under the past policy, many farmers insured only in those years when they felt that they were facing

unusual risks in producing their crops, and the insurance experience naturally suffered as a result of this unsound business increase.

The Corporation closed 1955 sales campaigns early in 88 winter wheat and fall multiple counties where the risk of loss was increasing as a result of the continued drought. No new 1955 business is being written in 16 North Dakota counties because of the rust risk that exists in these counties on durum wheat. While this policy reduces sharply the amount of business that otherwise might be written in such areas, sound insurance operations are impossible unless such basic insurance principles are followed. Eventually a firm policy in this regard should increase the number of continuous policyholders as farmers realize that crop insurance will not be available to them when their risk is greatest unless they have a policy already in force. There has been and will continue to be some protest against this policy among those who have regarded crop insurance as a program available for collection in loss years instead of an opportunity for farmers to build their own insurance protection along sound business lines.

#### *Some counties too highrisk*

Another serious problem from the standpoint of sound crop-insurance operations became apparent in analyzing the loss experience by counties and areas. While the purpose of crop insurance is to protect farmers against disastrous crop failures, a sound insurance operation cannot be developed if disaster years are too frequent unless premium rates are raised to a very impractical level.

While the crop-insurance experiment purposely offered insurance in the various areas in which the insured crop is produced, analysis of experience now indicates that there are some counties in the insurance program which apparently are too high risk to expect to develop a sound insurance program. These counties are in the Great Plains area of the Southwest which are subject to frequent and extreme drought.

To illustrate the seriousness of this situation from the standpoint of the total operation, there are 16 counties in this area in which indemnities paid since 1948 exceed by more than \$16 million the premiums paid by their policyholders. This means that, if insurance had not been offered in these 16 counties during the period since 1948, the Corporation would have a premium reserve of almost \$8,500,000 even after paying the heavy losses in 1953 and 1954.

#### *More attention to premium income*

Another weakness in the current limited operation which the Board expects to gradually correct is the number of counties with a low insurance potential based on the current program offered. Some of these will be supplemented by the addition of other insurance programs, while the most practical course in some will be to discontinue insurance until a program that will provide more adequate protection and premium income can be developed for these counties.

In order to progress toward a self-sustaining operation it is extremely important that premium income be greatly expanded above the present level so that the strength of numbers can be applied not only to the loss experience but also to obtaining administrative costs from premium income. Since the lifeblood of an insurance operation is its premium income, the Board intends that increasing attention shall be given to building premium income and spreading the risk by wider distribution among areas and crops. It would appear that too much attention has been given in the past to the number of applications filed and too little to the premium income from the contracts sold and serviced.

#### FCIC ADVISORY COMMITTEE

Secretary of Agriculture Ezra Taft Benson, on December 27, 1954, appointed a five-member Federal Crop Insurance Advisory Committee. The Committee was appointed at the request of the Board of Directors and is expected to review the FCIC operations within the near future and advise with the Board regarding future operations and program development. The members of the Committee are: Milton W. Mays, of Rye, N. Y., Chairman; Thomas F. Malone, of Cambridge, Mass.; Charles W. Tye, of New York City; Robert R. Coker, of Hartsville, S. C.; and John Scott, of Gilby, N. Dak.

*Crop insurance experience by years, 1948-54, all programs*

Program and year	Number of county programs	Amount of protection	Amount of premium	Number of indemnities	Amount of indemnities
<b>Corn:</b>		<i>Thousands</i>	<i>Thousands</i>		<i>Thousands</i>
1948.....	36	\$11,166	\$435	310	\$75
1949.....	44	16,683	587	549	95
1950.....	73	20,126	724	4,006	911
1951.....	98	27,929	1,080	8,230	2,567
1952.....	99	31,284	1,350	1,259	339
1953.....	108	37,302	1,664	1,118	278
1954.....	99	29,433	1,358	2,777	938
<b>Total.....</b>			7,198		5,203
<b>Tobacco:</b>					
1948.....	32	21,356	655	1,930	285
1949.....	35	22,922	740	3,644	489
1950.....	52	47,556	1,451	7,690	887
1951.....	69	50,349	1,586	4,878	779
1952.....	82	52,482	1,543	8,090	1,213
1953.....	103	68,355	2,029	24,829	3,852
1954.....	107	70,634	2,351	11,115	2,195
<b>Total.....</b>			10,355		9,700
<b>Wheat:</b>					
1948.....	200	84,542	8,580	9,929	5,010
1949.....	199	83,552	7,712	17,824	11,209
1950.....	283	95,867	8,254	12,302	4,287
1951.....	356	132,120	11,081	27,064	11,728
1952.....	390	149,422	12,443	17,728	10,570
1953.....	405	187,264	16,078	34,736	20,041
1954.....	402	144,027	12,963	31,553	18,880
<b>Total.....</b>			77,111		81,725
<b>Cotton:</b>					
1948.....	53	22,123	1,411	2,615	605
1949.....	52	26,717	1,580	9,512	3,112
1950.....	80	33,302	1,831	31,244	5,148
1951.....	101	44,647	2,674	8,154	2,203
1952.....	98	38,007	2,079	3,629	922
1953.....	109	47,190	2,354	5,407	2,457
1954.....	101	28,395	1,486	4,298	951
<b>Total.....</b>			13,415		15,398
<b>Flax:</b>					
1948.....	48	13,469	1,547	1,931	795
1949.....	48	7,784	882	2,599	543
1950.....	63	4,999	490	1,474	205
1951.....	61	4,698	459	1,857	226
1952.....	59	6,195	512	1,747	407
1953.....	53	8,928	824	3,755	786
1954.....	53	8,575	939	4,276	719
<b>Total.....</b>			5,653		3,681
<b>Dry edible beans:</b>					
1948.....	4	754	32	76	9
1949.....	9	1,737	95	323	61
1950.....	18	2,293	102	1,070	187
1951.....	29	3,913	191	1,555	599
1952.....	30	3,173	198	622	109
1953.....	30	4,087	230	645	142
1954.....	24	3,422	195	1,142	297
<b>Total.....</b>			1,043		1,404
<b>Multiple crop:</b>					
1948.....	2	587	24	11	1
1949.....	7	4,100	137	110	22
1950.....	55	36,305	1,252	4,061	1,174
1951.....	95	52,670	1,958	7,082	3,237
1952.....	115	68,849	8,020	9,867	7,047
1953.....	113	83,487	3,863	8,784	3,506
1954.....	96	68,573	3,230	10,064	4,583
<b>Total.....</b>			13,484		19,570
<b>Citrus:</b>					
1951.....	1	1,137	82	0	0
1952.....	1	804	56	1	0
1953.....	1	901	68	0	0

*Crop insurance experience by years 1948-54, all programs—Continued*

Program and year	Number of county programs	Amount of protection	Amount of premium	Number of indemnities	Amount of indemnities
<b>Citrus—Continued</b>		<i>Thousands</i>	<i>Thousands</i>		<i>Thousands</i>
1954.....	2	\$1,514	\$99	0	0
<b>Total.....</b>			300		\$2
<b>Total, all commodities:</b>					
1948.....	375	153,997	12,684	16,802	6,780
1949.....	394	163,495	11,733	34,561	15,531
1950.....	624	240,448	14,104	61,847	12,799
1951.....	810	317,463	19,111	58,820	21,339
1952.....	874	350,216	21,201	42,043	20,609
1953.....	922	437,514	27,105	79,274	31,062
1954.....	884	354,573	22,621	65,195	28,563
<b>Total.....</b>			128,559		136,683

## FINANCIAL STATEMENTS

**EXHIBIT A.—Comparative balance sheet as of June 30, 1954, and June 30, 1953**

	June 30, 1954	June 30, 1953	Increase or decrease (—)
<b>ASSETS</b>			
Cash.....	\$26,449,529.07	\$32,874,832.10	—\$6,425,303.03
Accounts receivable:			
Insured producers.....	7,776,952.76	7,795,944.29	—18,991.53
Less: Provision for uncollectible accounts.....	2,402,016.97	2,505,930.29	—103,913.32
Net amount.....	5,374,935.79	5,290,014.00	84,921.79
Total assets.....	31,824,464.86	38,164,846.10	—6,340,381.24
<b>LIABILITIES AND CAPITAL</b>			
Accounts payable:			
Indemnities payable, estimated.....	4,631.80	17,813.72	—13,181.92
Returned check unclaimed, canceled.....	1,166.66	724.55	442.11
Due administrative funds.....	137.32	108.42	28.90
Total accounts payable.....	5,935.78	18,646.69	—12,710.91
Deferred credits:			
Unapplied premium receipts.....	6,365.95	1,680.20	4,685.75
Advance premium payments.....	902,306.24	2,915,634.02	—2,013,327.78
Total deferred credits.....	908,672.19	2,917,314.22	—2,008,642.03
Deferred income: 1954 crop year premiums, net (less approved indemnity claims).....	5,965,629.92	6,257,364.66	—291,734.74
Other liabilities: Provision for surety losses.....	75,000.00	25,000.00	50,000.00
Total liabilities.....	6,955,237.89	9,218,325.57	—2,263,087.68
Capital:			
Capital stock authorized.....	100,000,000.00	100,000,000.00	
Less: Unissued stock.....	73,000,000.00	73,000,000.00	
Capital stock outstanding.....	27,000,000.00	27,000,000.00	
Insurance reserves:			
Wheat.....	1,302,865.41	5,583,459.71	—4,280,594.30
Cotton.....	—2,517,640.18	—2,386,840.78	—130,799.40
Flax.....	1,752,133.13	1,726,121.92	26,011.21
Corn.....	1,575,689.80	236,206.84	1,339,482.96
Tobacco.....	500,079.25	2,346,100.81	—1,846,021.56
Beans.....	—260,412.14	—345,611.86	85,199.72
Multiple crop.....	—4,732,102.39	—5,044,476.16	312,373.77
Citrus.....	197,875.42	135,178.47	62,696.95
Undistributed.....	50,738.67	—303,618.42	354,357.09
Total insurance reserves, exhibit A-1.....	—2,130,773.03	1,946,520.53	—4,077,293.56
Total capital.....	24,869,226.97	28,946,520.53	—4,077,293.56
Total liabilities and capital.....	31,824,464.86	38,164,846.10	—6,340,381.24

**EXHIBIT A-1.—Analysis of insurance reserves for crop years 1948 through 1953**

Crop	Premiums	Indemnities	Surplus or deficit (—)	Loss ratio
Wheat.....	\$64,147,629.48	\$62,844,764.07	\$1,302,865.41	0.98
Cotton.....	11,928,331.03	14,445,971.21	-2,517,640.18	1.21
Flax.....	4,714,886.74	2,962,753.61	1,752,133.13	.63
Corn.....	5,839,697.95	4,264,008.15	1,575,689.80	.73
Tobacco.....	8,004,247.38	7,504,168.13	500,079.25	.94
Beans.....	848,337.91	1,108,750.05	-260,412.14	1.31
Multiple crop.....	10,254,068.56	14,986,170.95	-4,732,102.39	1.46
Citrus.....	200,292.97	2,417.55	197,875.42	.01
<b>Total.....</b>	<b>105,937,492.02</b>	<b>108,119,003.72</b>	<b>-2,181,511.70</b>	<b>1.02</b>
Other income and expense, net.....			50,738.67	
Deficit (exhibit A).....			-2,130,773.03	

**EXHIBIT B.—Comparative statement of insurance operations for crop years 1953 and 1952 as of June 30, 1954**

Item	Crop year		Increase or decrease (—)
	1953	1952	
<b>Premiums:</b>			
Wheat.....	\$16,077,990.73	\$12,442,676.50	\$3,635,314.23
Cotton.....	2,353,603.28	2,079,004.60	274,598.68
Flax.....	824,490.78	511,901.14	312,589.64
Corn.....	1,663,750.46	1,349,711.13	314,039.33
Tobacco.....	2,028,749.95	1,542,990.08	485,759.87
Beans.....	230,565.01	197,968.04	32,596.97
Multiple crop.....	3,863,103.23	3,020,581.50	842,521.73
Citrus.....	62,696.95	55,981.95	6,715.00
<b>Total.....</b>	<b>27,104,950.39</b>	<b>21,200,814.94</b>	<b>5,904,135.45</b>
<b>Indemnities:</b>			
Wheat.....	20,040,916.54	10,570,246.14	9,470,670.40
Cotton.....	2,456,671.70	921,837.07	1,534,834.63
Flax.....	786,595.04	406,711.80	379,883.24
Corn.....	277,946.07	338,780.85	-60,834.78
Tobacco.....	3,851,694.13	1,212,758.02	2,638,936.11
Beans.....	142,183.70	109,598.41	32,585.29
Multiple crop.....	3,505,550.47	7,046,668.73	-3,541,118.26
Citrus.....		2,417.55	-2,417.55
<b>Total.....</b>	<b>31,061,557.65</b>	<b>20,609,018.57</b>	<b>10,452,539.08</b>
Premium surplus (—deficit).....	-3,956,607.26	591,796.37	-4,548,403.63
Other income and expense:			
Adjustments for 1950 and prior crop years.....	-4,618.33		-4,618.33
Interest income.....	163,045.27	159,976.96	3,068.31
Storage income.....		.55	-.55
Nonrefundable credits.....	654.33	1,035.64	-381.31
Provision for uncollectible accounts.....	-251,843.46	-189,296.61	-62,546.85
Debt cancellations.....	-19,156.54	-22,703.39	3,546.85
<b>Surplus (—deficit).....</b>	<b>-4,068,525.99</b>	<b>540,809.52</b>	<b>-4,609,335.51</b>
1953 deficit as above.....		-4,068,525.99	
1948-51 surplus.....		1,396,943.44	
<b>Deficit (exhibit A).....</b>		<b>-2,130,773.03</b>	

**EXHIBIT C.—Comparative statement of operating and administrative expenses for the 1954 and 1953 fiscal years, as of June 30, 1954**

Description	Fiscal year		Increase or decrease (—)
	1954	1953	
Operating and administrative expenses:			
Personal services.....	\$2, 910, 797. 89	\$3, 214, 712. 65	—\$303, 914. 76
Travel.....	759, 815. 91	767, 183. 01	—7, 367. 10
Transportation of things.....	29, 358. 89	13, 438. 51	15, 920. 38
Communication services.....	1 133, 184. 88	28, 665. 97	104, 518. 91
Rents and utility services.....	115, 864. 34	125, 654. 23	—9, 789. 89
Printing and reproduction.....	87, 641. 89	85, 062. 70	2, 579. 19
Other contractual services.....	15, 621. 94	28, 976. 30	—13, 354. 36
Coverage and rctc analysis expense.....	60, 000. 00	149, 465. 05	—89, 465. 05
Contract sales and servicing expense.....	2, 451, 592. 60	2, 202, 374. 60	249, 218. 00
Audit expense.....	12, 500. 91	9, 890. 41	2, 610. 50
Supplies and materials.....	44, 552. 93	37, 488. 74	7, 064. 19
Social security contributions.....	20, 103. 52	17, 307. 27	2, 796. 25
Total expense (excluding equipment purchases)....	6, 641, 035. 70	6, 680, 219. 44	—39, 183. 74
Equipment purchases.....	10, 321. 26	20, 922. 41	—19, 601. 15
Total expenses.....	6, 651, 356. 96	6, 710, 141. 85	—58, 784. 89

<sup>1</sup> Includes cost of all postage. Previously, no charge was made by Post Office Department for penalty indicia mail.

## APPENDIX B

### WAR DAMAGE CORPORATION PARTICIPATION AND FIDUCIARY AGENT AGREEMENT FORMS

#### PARTICIPATION AGREEMENT

This Agreement, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 194\_\_\_\_, by and between War Damage Corporation, a corporation created by Reconstruction Finance Corporation pursuant to section 5d of the Reconstruction Finance Corporation Act, as amended, and having its principal office in Washington, D. C., and \_\_\_\_\_, organized and existing under and by virtue of the laws of the State of \_\_\_\_\_, and having its principal office at \_\_\_\_\_,

Witnesseth:

Whereas, pursuant to section 5g of the Reconstruction Finance Corporation Act, as amended, War Damage Corporation (hereinafter referred to as the "Corporation") is authorized to provide reasonable protection against loss of or damage to property, real and personal, which may result from enemy attack (including any action taken by the military, naval or air forces of the United States in resisting attack); and

Whereas, the Corporation has promulgated certain written regulations entitled "War Damage Corporation, Regulations, Rules and Rates," pursuant to which it will issue policies of insurance (said written regulations, including the forms of application, the insurance policy and the endorsements made a part thereof, being hereinafter referred to as the "program"); and

Whereas the \_\_\_\_\_ (hereinafter called the "Participant") has, simultaneously herewith and as a condition hereto, entered into an agreement with the Corporation, under which the Participant agrees to utilize its offices and facilities to make available to the public insurance protection furnished by the Corporation under the program; and

Whereas it is the desire of the parties hereto that the Participant shall participate, in the manner and to the extent herein provided, in the final results of the program.

Now, therefore, in consideration of the premises and of the mutual covenants and agreements, and upon the terms and conditions hereinafter set forth, the parties hereto agree as follows:

1. The Participant hereby assumes a total obligation (hereinafter called "Participant's obligation") equal to \_\_\_\_\_ percent (\_\_\_\_\_% ) of ten percent (10%) of any net deficit (computed in conformity with the formula stated in paragraph 2) incurred under the program, but not more than \_\_\_\_\_ dollars (\$\_\_\_\_\_).

2. All benefits accruing to the Participant and the Participant's obligation hereunder are limited to the program in effect at the time this agreement is executed, but subject to such revisions thereof as the Corporation may make from time to time which are not inconsistent with the basic principles embodied in the program. For the purpose of this agreement, the results of the program shall be computed in conformity with the following formula :

## RECEIPTS

1. Gross premiums received less return premiums paid..... \$-----
2. Other income (exclusive of any payments received by the Corporation from the Participant pursuant to paragraph 3 hereof and exclusive of payments received by the Corporation in discharge of similar obligations undertaken by other insurance carriers pursuant to agreements substantially identical with this agreement entered into with the Corporation, said other insurance carriers being hereinafter referred to as the "other participants")-----
3. Total receipts (items 1 and 2)-----

## DISBURSEMENTS

4. Commissions paid to producers-----
5. Allowance for expenses to fiduciary agents-----
6. Operating expenses of the Corporation, including amounts paid as reimbursement for taxes and indemnifications-----
7. Loss adjustments and loss investigation expenses-----
8. Losses-----
9. Total disbursements (items 4 to 8, inclusive)-----
10. Net income or net deficit (excess of 3 over 9 or excess of 9 over 3)-----

3. The Corporation shall render to the Participant a statement in conformity with the foregoing formula as of the last day of any calendar year, or as of the last day of any quarter of any calendar year, as the Corporation may elect; and, if such statement shall show that a net deficit exists, then the Participant shall pay to the Corporation the amount of Participant's obligation with respect thereto; provided, however, the Participant shall not be required during any calendar year prior to final settlement to pay to the Corporation an amount greater than twenty-five percent (25%) of Participant's obligation.

4. The Participant shall be entitled to a refund of any payment on account of Participant's obligation made pursuant to paragraph 3 hereof to the extent that any subsequent statement as of the end of any calendar year shall disclose net income available for distribution to the Participant and to other participants, after making provision for losses incurred but not paid.

5. As of a date fixed by the Secretary of Commerce subsequent to the date on which the Corporation shall have discontinued the program, but not later than two (2) years subsequent thereto, or as of the date June 30, 1955, whichever date is the earlier, a final statement shall be made in conformity with the formula set forth in paragraph 2 and a final settlement shall be made in the following manner:

(a) If such statement shall show a net deficit, the Participant shall pay to the Corporation the amount of the Participant's obligation after crediting thereto any amounts which have been paid by the Participant pursuant to the provisions of paragraph 3 and not theretofore refunded pursuant to the provisions of paragraph 4. If the amounts so credited are in excess of the amount of the Participant's obligation, then the Corporation shall refund to the Participant the amount of such excess.

(b) If such statement shall show a net income, the Corporation shall pay to the Participant an amount not exceeding ----- percent of 10 percent of the amount of the net income and in no event more than \$-----; and, in addition, the Corporation shall pay to the Participant any amounts which have been paid by the Participant pursuant to the provisions of paragraph 3 and not theretofore refunded pursuant to the provisions of paragraph 4.

If at the final settlement date herein stated there shall be losses unsettled or in litigation or in process of adjustment, the estimated amount thereof shall be included as losses actually paid.

6. The Corporation may assign this agreement or its interest therein, to any other branch or department of the Government, and upon any such assignment the assignee shall acquire all the rights, interests, powers, and privileges of the

Corporation hereunder, and shall be bound by all the duties and obligations of the Corporation hereunder, it being expressly understood that any such assignment shall be subject to all the rights, powers, and privileges of the Participant and shall be conditioned upon the assignee's assumption of all duties and obligations of the Corporation hereunder.

The Participant, with the written consent of the Corporation, may assign this agreement or its interest therein and upon any such assignment the assignee shall acquire all the rights, interests, powers, and privileges of the Participant hereunder, and shall be bound by all of the duties and obligations of the Participant hereunder, it being expressly understood that any such assignment shall be subject to all the rights, powers, and privileges of the Corporation and shall be conditioned upon the assignee's assumption of all duties and obligations of the Participant hereunder. Upon the acceptance of such assignment by the Corporation, the assignor shall be released from any obligation hereunder.

7. This agreement shall take effect as of the date hereof and continue in effect until the end of the program or until June 30, 1955, whichever is the earlier, unless sooner terminated by the Corporation as hereinafter provided. This agreement shall be terminable by the Corporation at any time upon thirty (30) days' notice in writing to the Participant. Upon such termination of this agreement by the Corporation, the Corporation shall pay to the Participant any amount or amounts which have been paid by the Participant pursuant to the provisions of paragraph 3 and not theretofore refunded pursuant to the provisions of paragraph 4.

IN WITNESS WHEREOF, War Damage Corporation and \_\_\_\_\_, have caused this agreement to be executed by their respective duly authorized officers, and their respective corporate seals to be hereunto affixed, duly attested by their respective Secretaries, or Assistant Secretaries, as of the day and year first above written.

WAR DAMAGE CORPORATION,

By \_\_\_\_\_  
By \_\_\_\_\_

Attest:

\_\_\_\_\_  
*Secretary.*

Attest:

\_\_\_\_\_  
*Secretary.*

The War Damage Corporation was governed by a Board of Directors appointed by the RFC. With a small policymaking full-time staff, numbering about 15, it operated mainly through fiduciary agents (usually private insurance companies), who obtained insurance applications, issued policies in the name of WDC, and collected premiums. The standard form of fiduciary agent agreement was as follows:

#### FIDUCIARY AGENT AGREEMENT

This Agreement, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 194\_\_\_\_, by and between WAR DAMAGE CORPORATION, a corporation created by Reconstruction Finance Corporation pursuant to Section 5d of the Reconstruction Finance Corporation Act, as amended, and having its principal office in Washington, D. C., and \_\_\_\_\_, a \_\_\_\_\_, organized and existing under and by virtue of the laws of the State of \_\_\_\_\_, and having its principal office at \_\_\_\_\_.

#### WITNESSETH

Whereas pursuant to Section 5g of the Reconstruction Finance Corporation Act, as amended, War Damage Corporation (hereinafter referred to as the "Corporation"), is authorized to provide reasonable protection against loss or damage to real or personal property resulting from enemy attack, including any action taken by the Military, Naval, or Air Forces of the United States in resisting enemy attack; and desires to make such protection available to the public through the facilities of the \_\_\_\_\_ (hereinafter referred to as the "Fiduciary Agent"),

Now, therefore, in consideration of the premises and of the mutual covenants and agreements and upon the terms and conditions hereinafter set forth, the parties hereto agree as follows:

1. The Corporation hereby authorizes the Fiduciary Agent to perform the functions hereinafter provided for, subject to the terms and conditions hereinafter specified.

2. The Fiduciary Agent agrees to utilize its offices and facilities to make available to the public the insurance protection furnished by the Corporation. The Fiduciary Agent, for and on behalf of the Corporation, shall receive applications for insurance, collect premiums therefor, and issue policies of insurance of the Corporation on forms furnished and prescribed by the Corporation and in conformity with the rules and rates prescribed by the Corporation. The Fiduciary Agent may act through its home office or branch offices. In the discharge of the duties and obligations arising under this agreement, the Fiduciary Agent shall conform to a standard of performance and accuracy reasonably to be expected of an insurance company in the administration of its own business and consistent with the highest degree of good faith.

3. The Fiduciary Agent shall (a) deduct from each premium received and pay to the producer thereof a service fee equal to five percent (5%) of the amount of such premium, but not less than One Dollar (\$1.00) for any one policy and not more than One Thousand Dollars (\$1,000) for any one policy; (b) deduct from each premium received an expense reimbursement equal to three and one-half percent ( $3\frac{1}{2}\%$ ) of such premium, but not less than Fifty Cents (50¢) for any one policy and not more than Seven Hundred Dollars (\$700) for any one policy; provided, however, that such Fiduciary Agent's expense reimbursement may be adjusted from time to time by agreement between the parties, it being the intention of the parties that such allowance shall cover without profit the direct, actual, and necessary expenses of the Fiduciary Agent in connection with its operations and activities hereunder, exclusive of any expenses for executive management or expenses normally incident to its regular business.

4. All premiums received by the Fiduciary Agent in connection with its operations and activities hereunder shall be segregated from the funds of the Fiduciary Agent and shall be held in trust for the Corporation. Such premiums shall be deposited by the Fiduciary Agent in a special bank account (or accounts) to be established by the Fiduciary Agent in its own name, designated "War Damage Account," in a bank which is a member of the Federal Reserve System or, when approved by the Corporation, in another commercial bank. The moneys in such account shall be used only for the purposes of War Damage Corporation and to that end the Fiduciary Agent is authorized to draw on such account for the purpose of paying the service fees and expense reimbursement set out in paragraph 3 and to refund return premiums payable to insureds, provided, however, the Depositary shall not be responsible for the proper application of any such funds. The Corporation agrees to give the Fiduciary Agent appropriate power of attorney or authority to deposit in the aforesaid bank account (or accounts) checks to the order of the Corporation. The Fiduciary Agent shall make deposits to the Corporation's account at the Federal Reserve Bank as often as required by the Corporation but not less often than once a week, provided that moneys be maintained with the approval of the Corporation in "War Damage Account" sufficient to enable the Fiduciary Agent to carry on its daily operations and activities hereunder commensurate with the volume of business transacted by it.

As soon as practicable but in no event later than twenty (20) days after the close of each calendar month, the Fiduciary Agent shall transmit to the Corporation through the Federal Reserve Bank a report on forms prescribed by the Corporation, duly certified by an authorized officer of the Fiduciary Agent, covering all collections and expenditures made to the end of the preceding calendar month, and shall remit the net balance due according to such report. For the purposes hereof the net balance shall mean the gross premiums less authorized deductions and return premiums. The Corporation shall make appropriate reimbursement to the Fiduciary Agent in the event such report shows a credit balance in favor of the Fiduciary Agent as of the end of the preceding calendar month.

5. The Fiduciary Agent shall maintain a complete separate system of books of record and accounts covering its operations and activities hereunder. The

accounting forms used by the Fiduciary Agent and the accounting methods employed by it shall be subject to the approval of the Corporation.

The Fiduciary Agent shall submit to the Corporation not later than the 20th day of each month, as of the close of the preceding calendar month, a report on forms approved by the Corporation, duly certified by an authorized officer of the Fiduciary Agent, covering such statistical information as is available and may be required by the Corporation.

The Fiduciary Agent agrees that the books and records maintained in connection with its operations and activities hereunder are the property of the Corporation and will at any time within three (3) years after the termination of this agreement be delivered to the Corporation on its request, provided, however, that the Fiduciary Agent shall be entitled to full release respecting all matters arising under this agreement at the time of such delivery of records.

The Corporation or its authorized representatives shall at all times during the period in which this agreement is in force, or within three (3) years after its termination, have free access to the Corporation's books and records maintained by the Fiduciary Agent pertaining to its operations and activities hereunder for the purpose of making audits or otherwise, and in matters relating to any claim for loss the Corporation shall have free access to records pertaining to its operations and activities hereunder until final settlement of such claim. The scope of all audits of the records referred to in this agreement shall be subject to the approval of the Chief Auditor of the Corporation.

6. In the event the Fiduciary Agent shall receive notice of loss upon any policy of the Corporation issued by the Fiduciary Agent, the Fiduciary Agent shall promptly notify the Corporation, or its authorized representative, and furnish on request appropriate information as to the insurance involved in such loss.

7. The Fiduciary Agent agrees that while this agreement is in force it will not write under contracts of insurance or reinsurance any coverage available through the Corporation, except waterborne risks (hull and cargo), and shipments of cargo in connection with waterborne commerce, and such coverage as may be incidental to coverage other than war damage regularly written by the Fiduciary Agent.

8. It is recognized that in the conduct of its operations and activities hereunder the Fiduciary Agent shall act in the capacity of agent for the Corporation as principal. It is further understood that such Fiduciary Agent undertakes this contract in good faith and agrees to carry out the provisions thereof, insofar as it may legally do so, to the best of its ability and capacity.

9. Notwithstanding the provisions of paragraph 3 hereof, in the event that the Fiduciary Agent, after giving notice to the Corporation, shall be compelled to pay to any state or political subdivision thereof any tax or fee or interest or penalty relating thereto claimed to be due by reason of the business transacted pursuant to this agreement, the Fiduciary Agent shall be reimbursed by the Corporation therefor, and for any special expenses necessarily incurred in connection therewith. Moreover, if the Corporation shall reject any claim for loss under any policy of insurance issued pursuant to this agreement and if legal proceedings be instituted against the Fiduciary Agent with respect to such claim, or if the Fiduciary Agent shall be obligated to defend any legal suit or proceeding on account of its action in rejecting any application or failing to issue any policy or in canceling any policy, or in denying the payment of any return premium, the Corporation shall, upon due notice at its expense, defend such proceeding and if in any such proceeding the Fiduciary Agent be compelled to make payment, the Corporation shall reimburse the Fiduciary Agent for the amount thereof, provided always the action of the Fiduciary Agent complained of shall have been consistent with the standard of performance required hereunder. In any of the foregoing cases, the Fiduciary Agent shall render to the Corporation such reasonable cooperation and assistance as the Corporation may require.

10. This agreement shall take effect as of the date executed by the Corporation and continue in force until terminated by either party by giving at least thirty (30) days' written notice by registered mail to the other party stating the effective date and time on which this agreement shall terminate.

11. The term "Fiduciary Agent," as used herein, is intended merely to designate the name of the party and shall not be construed as imposing any special obligations or responsibilities except as herein provided.

In Witness Whereof, the parties hereto have caused this instrument to be executed by their respective duly authorized officers or representatives and to be delivered as of the day and year first above written.

WAR DAMAGE CORPORATION,

By \_\_\_\_\_  
Secretary.

Attest:

\_\_\_\_\_  
By \_\_\_\_\_  
Secretary.

Attest:

Private organizations were also used to recommend adjustments of loss claims filed under WDC insurance policies.

## APPENDIX C

### WAR DAMAGE CORPORATION REGULATIONS, RULES, AND RATES

All quotations for insurance under policies to be issued by War Damage Corporation shall be made subject to the regulations herein set forth and all policies of insurance shall be issued in accordance therewith. Such regulations are subject to change or amendment upon publication by War Damage Corporation. Notice of such change or amendment will be given to fiduciary agents.

#### REGULATIONS A—EFFECTIVE JULY 1, 1942

##### FOREWORD

**War Damage Corporation.**—War Damage Corporation is a corporation created by Reconstruction Finance Corporation pursuant to section 5d of the Reconstruction Finance Corporation Act, as amended, herein called the Corporation. Pursuant to section 5g of the Reconstruction Finance Corporation Act, as amended, the Corporation is authorized to provide reasonable protection against loss of or damage to property, real and personal, which may result from enemy attack (including any action taken by the military, naval, or air forces of the United States in resisting enemy attack). The Corporation is prepared to offer such protection in accordance with the regulations set forth herein, as may be amended from time to time by the Corporation. These regulations contain appropriate instructions to producers and fiduciary agents regarding the issuance of policies of insurance by the Corporation. Inquiries of producers concerning these regulations or any other matters relating to the Corporation's program should be directed to a fiduciary agent.

**Territory.**—For the present, insurance will be written on properties situated in the continental United States of America, Alaska, Virgin Islands, Hawaii, Puerto Rico, and the Canal Zone.

##### EXPLANATION OF TERMS USED HEREIN

**Applicant.**—The term "applicant" shall mean any person, public or private, including any individual, partnership, corporation, association, State, county, municipality, or other political subdivision, having an insurable interest in property eligible for coverage by policies of insurance issued by the Corporation pursuant to these regulations and making application to the Corporation for such coverage on the forms of application prescribed by the Corporation.

**Insured.**—The term "insured" shall mean any applicant to whom a policy of insurance is issued by the Corporation in accordance with these regulations.

**Producer.**—The term "producer" shall mean (a) any authorized insurance broker or (b) any agent of a fire insurance carrier which has been appointed by the Corporation as its fiduciary agent, provided that such insurance broker or such agent is duly licensed in accordance with the legal requirements of the State, Territory, or district in which he acts as a producer.

A direct writing mutual company or reciprocal exchange appointed by the Corporation as its fiduciary agent may also act as a producer and may also des-

ignate another direct writing mutual company or reciprocal exchange as a producer, provided any such producer so designated shall be licensed as an insurer in the jurisdiction where it acts as a producer.

**Fiduciary agent.**—The term "fiduciary agent" shall mean any insurance carrier (capital stock insurance company, mutual insurance company, or reciprocal exchange) which has been specifically appointed by the Corporation to act as its fiduciary agent under a "fiduciary agent agreement." Each fiduciary agent so appointed is empowered to receive applications and remittances covering premiums, to issue policies, and otherwise to transact such business of the Corporation in accordance with these regulations.

#### RULES

##### *Issuance of policies*

**Rule 1.**—Policies may be issued only through a fiduciary agent.

##### *Only one policy permissible*

**Rule 2.**—Only one policy shall be permitted to the insured on any one property (or group of properties, if written blanket) and only one policy shall be permitted to the insured for any of the following types of coverage:

1. Properties at fixed locations, and vehicles when specified (including pleasure aircraft or watercraft while laid up ashore or afloat). (See application WDC Form No. 2.)
2. Property in transit. (See application WDC Form No. 3.)
3. Builders' risk on hulls. (See application WDC Form No. 4.)
4. Cargo stored afloat. (See application WDC Form No. 5.)
5. Hulls. (See application WDC Form No. 6.)
6. Growing crops and/or orchards. (See application WDC Form No. 7.)

##### *Application for coverage*

**Rule 3.** The applicant shall apply for insurance through any producer, on the appropriate application forms prescribed by the Corporation. Three copies of the application and, in any proper case, six copies of the schedule (WDC Form No. 11) shall be signed by the applicant. The forms of application will be supplied in sets, consisting of three numbered copies of the application (Nos. 1, 2, and 3) and three attached tickets (Nos. 4, 5, and 6) which will correspond to the upper part of the application. The producer shall complete the application and ticket forms in one operation, complete and attach the copies of the schedule (if any), and retain the No. 3 copy of the application. No. 1 and No. 2 copies of the application and all three copies of the ticket shall be mailed to the fiduciary agent.

"Construction" and "occupancy" classification code numbers are specified in appendix A (which is made a part of these regulations) for each class of property or risk. The producer shall insert in the spaces provided therefor in the application and the schedule (if any) the proper code numbers. The producer shall also insert in the space provided therefor in the application and the schedule (if any) the appropriate coinsurance percentage as explained in the application. Applications transmitted by the producer to the fiduciary agent shall be accompanied by cash, money order, or check in full payment of the required premium. Money orders and checks shall be drawn to the order of the fiduciary agent to which the application is transmitted. The application and the schedule (if any), a copy of which shall be attached to and form a part of the policy, will contain the only description of the property insured, and the producer shall make certain that the application contains all descriptive information required thereby.

##### *Effective date and term of insurance*

**Rule 4.** *The producer's acceptance of the application does not constitute a binder.*—The insurance applied for shall take effect on the "effective date," at noon standard time, at the place where the property is located, and shall terminate 12 months thereafter at the same hour. (For term of transit risk coverage, see application WDC Form No. 3.) (For cancellation provisions, see rule 6.) If the application has been properly completed and is accompanied by full payment of premium, the "effective date" shall be the date on which the application is received and date-stamped by the fiduciary agent (but in no event earlier than July 1, 1942), unless a later date is requested in the application.

*Policy form and coverage*

Rule 5. Insurance will be written only on the form of policy prescribed by the Corporation. (See specimen form of policy, WDC Form No. 1, appended to these regulations.) The policy will cover only direct physical loss of or damage to the property insured. The policy does not provide consequential coverage, such as use and occupancy, rent and rental value, or coverage for other indirect losses.

*Cancellation*

Rule 6. The policy may be canceled, upon the request of the insured and surrender of the policy, only in case of change in ownership of the property or the insured's interest therein. If the policy is issued in violation of these regulations, the policy may be canceled by the Corporation by delivering or mailing to the insured and to the loss payee (if any) at the address given in the application, 5 days' written notice. In the event of cancellation, the prorata "net premium" shall be returned.

*Net premium*

Rule 7. The term "net premium" shall mean: the gross premium less (a) the producer's service fee (5 percent, subject to the minimum and maximum provided in rule 13), and (b) the fiduciary agent's expense reimbursement (3½ percent, subject to the minimum and maximum allowable in accordance with the "fiduciary agent agreement").

*Reduction of or addition to policy amount*

Rule 8. The policy may, upon application, be reduced in amount in the event that the insured disposes of or changes his interest in any of the property covered by the policy and the return premium due the insured shall be calculated on a pro rata net premium basis. The policy may, upon application, and upon payment of the proper premium, be increased in amount, subsequent to the effective date, to cover property in additional amounts or at additional locations. Reporting forms of policies will not be issued. No producer's service fee or fiduciary agent's expense reimbursement shall be paid on additional premiums. No payment shall be required by or made by the Corporation where the additional or return premium is less than 50 cents. (For application forms covering reductions or additions, see WDC Form Nos. 8 and 9.)

*Blanket insurance*

Rule 9. Where more than one property is under the same ownership whether at one or more locations, all such properties may be insured under one policy for an amount of insurance covering blanket on all such properties, provided the application (and the schedule, if any) shall set forth the approximate distribution of the total coverage on all such properties according to the respective States, Territories, possessions, and coded cities of location. The rate for blanket insurance shall be the rate for the highest rated building or location. The pro rata distribution clause in the policy applies with respect to blanket insurance written subject to less than 90 percent coinsurance.

*Owners of mortgage or financial interests*

Rule 10. Policies may be issued to mortgagees or other holders of security or financial interests in property eligible for coverage under these regulations. The rate shall be determined according to these regulations on the basis of the coded classification of the property and risks covered and the coverage shall be subject to all the conditions of the policy. If blanket policies are issued covering mortgage or other financial interests, the provisions of these regulations relating to blanket insurance shall apply. (See rule 9.)

*Loss-payable clause*

Rule 11. The application forms include a loss-payable provision, and in any case where the applicant desires that payment under the policy be made to any party in interest in addition to the insured, the loss-payable provision must be completed properly. No mortgagee clause will be attached to the policy.

*Loss adjustments*

Rule 12. In the event of loss, the insured shall give immediate written notice to the fiduciary agent through which the policy was issued, and the insured shall comply with the provisions of the policy relating to requirements in case of loss. Adjustment and settlement of the loss will be effected in accordance with the Corporation's established procedure.

*Service fee to producer*

Rule 13. The service fee to the producer shall not exceed 5 percent of the premium, with a minimum fee of \$1 per policy, and a maximum fee of \$1,000 per policy. The service fee shall not be deducted from the remittance which accompanies the application. The service fee may be paid on each policy issued, and shall become due upon the issuance of the policy and shall be payable on or before the 20th of the month following. Service fees shall be paid on renewals. Service fees may be paid only to producers. (For provisions relating to service fees in connection with additional or return premiums, see rule No. 8.)

*Minimum premium*

Rule 14. The minimum premium shall be \$3 per policy.

*Other insurance*

Rule 15. The other insurance clause of the policy provides that if there is any other insurance covering the property, whether prior to, subsequent to, or simultaneous with the insurance under the policy, which in the absence of the insurance under the policy would cover the loss or damage covered by the policy, then the insurance under the policy becomes excess insurance and does not apply except over and above such other insurance.

*Reporting forms prohibited*

Rule 16. Reporting forms of policies will not be issued.

*Limits of coverage for vessel properties and cargoes stored on vessels*

Rule 17. Insurance provided by the Corporation covers the vessels or craft or cargo hereinafter described while confined to the limits of the harbors or other inland waters of the United States, as defined in section 2 of the act of Congress of February 19, 1895, and set forth in the Pilot Rules for Certain Inland Waters as issued by the Department of Commerce, or while confined to the Great Lakes (including the waterways connecting them, and their harbors and tributaries in the United States), or while confined to harbors and inland waters of the Canal Zone, Puerto Rico, Virgin Islands, and Territories of Hawaii and Alaska:

(a) Vessels used exclusively for storage, housing, manufacturing, or generating power.

(b) Pleasure craft (including vessels utilized for pleasure fishing, but excluding those employed in commercial fishing), but only while laid up afloat or ashore.

(c) All vessels or craft while under construction until delivery by the builder or sailing on delivery or trial trip, whichever shall first occur.

(d) Cargoes on vessels described in (a) above.

*Policy exclusions*

Rule 18. Unless otherwise specifically provided in writing thereon in accordance with these regulations, the policy shall not cover accounts, bills, currency, deeds, evidences of debt, securities, money, bullion, stamps, furs, jewelry, precious and semiprecious stones, works of art, statuary, paintings, pictures, etchings, antiques, stamp and coin collections, manuscripts, books and printed publications more than 50 years old, models, curiosities, objects of historical or scientific interest, pleasure water craft, pleasure aircraft, standing timber, growing crops, orchards, or any real property which is not a part of a structure or building. Provisions for coverage by separate application or endorsement with respect to some of the foregoing excluded types of property are set forth in rule 23, rule 24, rule 25, rule 26, and rule 27. These regulations make no provision for insurance with respect to other excluded types of property.

*Rates*

Rule 19. The rates for coverage under the policy shall be determined according to the construction classification, occupancy classification, and coinsurance requirements, all as set forth in appendix A which is made a part of these regulations. The producer shall determine the proper rate for the coverage applied for under the application and shall insert such rate in the appropriate space provided on the application and the schedule (if any). (For provisions relating to construction codes, see rule 20; occupancy codes, see rule 21; coinsurance requirements, see rule 22.)

*Construction codes*

Rule 20. The producer shall insert in the proper space on the application and the schedule (if any) the appropriate construction classification code number, in accordance with the construction classification code numbers set forth in appendix A which is made a part of these regulations. In the case of a risk composed of different classes of construction, if not less than 75 percent of the total floor area (including basements) is of one class of construction, the risk may be coded according to such predominating class of construction. Otherwise, such risk must take the class rate of the higher rated class of construction. The term "risk" shall mean a single building, or a group of buildings, and contents situated at one location.

*Occupancy codes*

Rule 21. The producer shall insert in the proper space in the application and the schedule (if any) the appropriate occupancy classification code number in accordance with the occupancy classification code numbers set forth in appendix A which is made a part of these regulations.

*Coinurance clause*

Rule 22. The coinsurance clause contained in the policy does not apply to dwellings or farm properties, nor to the types of property described in rule 23, rule 24, rule 25, and rule 26.

*Coverage for commercial furs, jewelry, art objects, and the like*

Rule 23. Furs and jewelry of commercial dealers, and works of art, statuary, paintings, pictures, etchings, antiques, stamp and coin collections, manuscripts, books and printed publications more than 50 years old, models, curiosities, and objects of historical or scientific interest, when owned by commercial dealers, cultural institutions, or, when open for public display, by private persons, may be specifically covered, provided the application or the schedule attached thereto sets forth separately the description, location, and the amount of coverage of the property to be so covered. The limit of coverage shall be \$5,000 for any one article and the limits of coverage for any one interest at any one location shall be as follows:

Works of art, statuary, painting, etchings, pictures, and antiques.....	\$100, 000
Jewelry .....	100, 000
Furs .....	100, 000
Stamp and coin collections, manuscripts, and books and printed publications more than 50 years old.....	100, 000
Models, curiosities, and objects of historical or scientific interest.....	100, 000

In any such case the fiduciary agent shall attach to the policy a separate endorsement (or endorsements) extending the coverage of the policy to include each type of such property so listed in the application and/or the schedule, subject to the foregoing limits of coverage. Such endorsement shall also state that the coinsurance clause and pro rata distribution clause, both of which are a part of the policy, shall not be applicable to the property covered under the endorsement. Such endorsement shall be in the form set forth in rule 27.

*Coverage for privately owned furs, jewelry, art objects, and the like*

Rule 24. Furs, jewelry, works of art, statuary, paintings, pictures, etchings, antiques, stamp and coin collections, manuscripts, books and printed publications more than 50 years old, models, curiosities, and objects of historical and scientific interest, when privately owned, may be specifically covered, provided the application or the schedule attached thereto sets forth separately the description, location and the amount of coverage of the property to be so covered. The limits of coverage shall be \$5,000 for any one article and a total of \$10,000 for any one interest with respect to any and all of the foregoing types of property. In any such case the fiduciary agent shall attach to the policy a separate endorsement (or endorsements) extending the coverage of the policy to include each type of such property so listed in the application and/or the schedule, subject to the foregoing limits of coverage. Such endorsement shall also state that the coinsurance clause and pro rata distribution clause, both of which are a part of the policy, shall not be applicable to the property covered under the endorsement. Such endorsement shall be in the form set forth in rule 27.

*Coverage for pleasure watercraft and pleasure aircraft*

Rule 25. Pleasure watercraft and pleasure aircraft may be specifically covered while laid up ashore or afloat provided the application or the schedule attached thereto sets forth separately the description, location, and the amount of coverage of the property to be so covered. The limit of coverage shall be \$10,000 for any one craft. In any such case the fiduciary agent shall attach to the policy a separate endorsement (or endorsements) extending the coverage of the policy to include each type of such property so listed in the application, subject to the foregoing limit of coverage. Such endorsement shall also state that the co-insurance clause and pro rata distribution clause, both of which are a part of the policy, shall not be applicable to the property covered under the endorsement. Such endorsement shall be in the form set forth in rule 27.

*Coverage for growing crops and orchards*

Rule 26. Growing crops and orchards may be specifically covered, provided the separate form of application for insurance covering growing crops and orchards is completed by the applicant. The limit of coverage shall be \$100,000 for any one interest.

*Form of endorsement for excluded property*

Rule 27. All endorsements attached to the policy for coverage pursuant to the provisions of rule 23, rule 24, or rule 25, shall be in the following form:

"This policy is hereby extended to cover

(Insert description of property)

subject to a limit of loss not exceeding \$\_\_\_\_\_ for any one article (craft). The coinsurance clause and the pro rata distribution clause contained in this policy are not applicable to the property covered by this endorsement. All other terms and conditions of this policy remain unchanged.

"\_\_\_\_\_  
(Authorized fiduciary agent)  
"By \_\_\_\_\_"

The dollar amount which shall be inserted in the blank space of the foregoing form of endorsement shall be the amount of coverage applicable to the property described in such endorsement, or the limit of coverage specified in rule 23, rule 24, or rule 25, as the case may be whichever is the lesser.

*Explanation of pro rata distribution clause*

Rule 28. The effect of the pro rata distribution clause is to distribute proportionately the amount of insurance where more than one building, structure, or place is covered under one blanket amount. This clause has the effect of prorating the total amount of the insurance in the proportion that the value of each building, structure, or place bears to the total value of all buildings, structures, or places insured. The following is an illustration:

If there is \$100,000 worth of merchandise in two buildings, and blanket insurance is in force in the amount of \$50,000, and if the value is distributed between the two buildings as follows:

In building A—Value_____	\$75,000
In building B—Value_____	25,000
Total value_____	100,000

the pro rata distribution clause distributes the \$50,000 insurance as follows:

75/100 of \$50,000 in building A_____	\$37,500
25/100 of \$50,000 in building B_____	12,500

In other words, the effect of the pro rata distribution clause is the same as if the property owner had carried insurance under two specific items, one for \$37,500 covering in building A, and one for \$12,500 covering in building B, instead of the one \$50,000 blanket amount.

*Explanation of coinsurance clause*

Rule 29. The effect of the coinsurance clause is to assess equitably the cost of the insurance. The following is one illustration:

Value .....	\$10,000
Insurance required by (50 percent) coinsurance clause.....	5,000
Insurance actually carried.....	5,000
Loss .....	1,000

In this case, the property owner has carried sufficient insurance to comply with the 50 percent coinsurance clause and, therefore, the loss of \$1,000 would be paid in full.

The following is another illustration:

Value .....	\$10,000
Insurance required by (50 percent) coinsurance clause.....	5,000
Insurance actually carried.....	2,500
Loss .....	1,000

In this case, since the property owner has carried only one-half of the required amount of insurance, he would collect but one-half of his loss. The property owner would then recover only 50 percent of his loss, or \$500.

In the case of a total loss under either illustration, the property owner would collect the face amount of the policy.

## APPENDIX A

*Rate schedule.*—See pages 2 to 5, inclusive.

*Construction code.*—For the purpose of determining rates for coverage, risks shall be coded as to construction as follows:

Coverage on or in buildings or structures of fire resistive construction according to fire-insurance standards.....	<i>Code</i> 1
Coverage on or in buildings or structures of any other construction, and property in the open.....	2

In the case of a risk composed of different classes of construction, if not less than 75 percent of the total floor area (including basements) is of one class of construction, the risk may be coded according to such predominating class of construction. Otherwise, such risk must take the class rate of the higher rated class of construction. (See rule 20.)

(The term "risk" as used herein may be construed to mean a single building, or a group of buildings, and contents situated at one location.)

*Coinsurance credits.*—Rates are based upon the use of the 50 percent coinsurance clause, which is the minimum permissible, except as otherwise specifically provided herein:

For 80 percent coinsurance clause, deduct 30 percent from the base rate.

For 90 percent coinsurance clause, deduct 35 percent from the base rate.

For 100 percent coinsurance clause, deduct 40 percent from the base rate.

*Sprinkler credit.*—If not less than 75 percent of the total floor area (including basements) of the risk is equipped with a system of automatic sprinklers, deduct 10 percent from the base rate.

*Blanket policies.*—Blanket policies take the rate of the highest rated building or location. (See rule 9.)

## Rate schedule

[Rates are for building and contents unless otherwise noted—Minimum premium of \$3 per policy]

	Occu- pancy code No. 1	Con- struc- tion code No.	Annual rates per \$100 of insurance				
			No co- insur- ance	With coinsurance of—			
				50 per- cent	80 per- cent	90 per- cent	100 per- cent
Dwellings and their contents..... (Dwellings comprising less than 5 family units including private garages, out-building and private passenger automobiles) (use application WDC Form No. 2).	01	1 or 2	\$0.10	(?)	(?)	(?)	(?)
Farm properties and their contents..... (Farm properties and their contents shall include private garages, private barns and out-buildings, farm implements, livestock, and motor vehicles used for farm or pleasure purposes) (use application WDC Form No. 2).	02	1 or 2	.10	(?)	(?)	(?)	(?)
Churches, hospitals, educational or cultural institutions, libraries, museums, public buildings (use application WDC Form No. 2).	NS 03	1	-----	\$0.10	\$0.07	\$0.065	\$0.06
	S 03	1	-----	.09	.063	.059	.054
	NS 03	2	-----	.15	.105	.098	.09
	03	2	-----	.135	.095	.088	.081
Apartments, hotels, offices, mercantiles, warehouses and other buildings not used for manufacturing (use application WDC Form No. 2).	NS 04	1	-----	.15	.105	.098	.09
	S 04	1	-----	.135	.095	.088	.081
	NS 04	2	-----	.20	.14	.13	.12
	S 04	2	-----	.18	.126	.117	.108
Manufacturing plants, piers, wharves, bridges, and structures not otherwise specifically provided for (use application WDC Form No. 2).	NS 05	1	-----	.20	.14	.13	.12
	S 05	1	-----	.18	.126	.117	.108
	NS 05	2	-----	.30	.21	.195	.18
	S 05	2	-----	.27	.189	.176	.162
Street railway and railroad properties (except trackage and roadbeds and rolling stock and their contents) (use application WDC Form No. 2).	NS 06	1 or 2	-----	.30	.21	.195	.18
	S 06	1 or 2	-----	.27	.189	.176	.162
Rolling stock (use application Form No. 2).	07	-----	-----	.25	.175	.163	.15
Trackage and road beds (use application WDC Form No. 2).	08	-----	-----	.10	.07	.065	.06
Builders' risk shall take the rate applicable to the completed building or structure (use application WDC Form No. 2).							
Floater policies shall cover movable property at any location, but shall not cover while in transit. (use application WDC Form No. 2).	09	-----	(?)	(?)	(?)	(?)	\$0.25
Motor vehicles, except those hereinabove provided for under dwellings and farm properties (use application WDC Form No. 2).	10	-----	-----	.25	.175	1.63	.15
Growing crops and orchards (use application WDC Form No. 7).	11	-----	.05	(?)	(?)	(?)	(?)
Transit Risks (use application WDC Form No. 3).	12	-----	.03	(?)	(?)	(?)	(?)
Insurance to be applied for on the basis of:							
(a) The highest of items (a), (b), and (c) of the application in the case of a 12 months' policy; or							
(b) Item (d) of the application in the case of a 3 months' policy issued to an applicant who has been in business for less than 3 months; or							
(c) Item (e) of the application in the case of a trip risk.							

See footnotes at end of table, p. 312.

## Rate schedule—Continued

[Rates are for building and contents unless otherwise noted—Minimum premium of \$3 per policy]

	Occu- pancy code No. <sup>1</sup>	Con- struc- tion code No.	Annual rates per \$100 of insurance				
			No co- insur- ance	With coinsurance of—			
				50 per- cent	80 per- cent	90 per- cent	100 per- cent
<b>Vessels:</b>							
Commercial hulls:							
All metal (including hull, deck and superstructure).....	13	1	\$0.50	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Others.....	13	2	.75	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
(Use application WDC Form No. 6.)							
Builders' risk:							
All metal (including hull, deck, and superstructure).....	13	1	.25	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Others.....	13	2	.375	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
(Use application WDC Form No. 4.)							
(Premiums calculated on com- pleted price.)							
Cargo stored afloat:							
All metal (including hull, deck, and superstructure) (use application WDC Form No. 5).....	13	1	.50	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Others (use application WDC Form No. 5).....	13	2	.75	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Publicly or privately owned utilities, such as light, water, heat, power and communication systems, including transmission lines, underground pip- ing, wiring and conduits (use applica- tion WDC Form No. 2).....	14	1 or 2	.....	\$0.30	\$0.21	\$0.195	\$0.18
Furs, jewelry, art objects, and the like (use application WDC Form No. 2)...	15	1 or 2	.75	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Pleasure aircraft or pleasure water craft (use application WDC Form No. 2)...	16	1 or 2	.....	.25	.175	.163	.15

<sup>1</sup> NS, without automatic sprinklers, S, with automatic sprinklers.<sup>2</sup> Coinsurance does not apply.<sup>3</sup> 100 percent coinsurance mandatory.

*Coded city, State, Territory, and possessions codes*

Alabama.....	01	Birmingham.	New Jersey.....	49	Jersey City.
Alaska.....	02	Remainder of State.		50	Newark.
Arizona.....	03		New Mexico.....	51	Remainder of State.
Arkansas.....	04		New York.....	52	Buffalo.
California.....	05	Los Angeles.		53	New York City.
	06	Oakland.		54	Rochester.
	07	San Francisco.		55	Remainder of State.
	08	Remainder of State.	North Carolina.....	56	
Colorado.....	09	Denver.	North Dakota.....	57	Cincinnati.
	10	Remainder of State.	Ohio.....	58	Cleveland.
Connecticut.....	11			59	Columbus.
Delaware.....	12			60	Toledo.
District of Columbia..	13			61	Remainder of State.
Florida.....	14		Oklahoma.....	62	Portland.
Georgia.....	15	Atlanta.	Oregon.....	63	Remainder of State.
	16	Remainder of State.		64	Philadelphia.
Hawaiian Islands.....	17		Panama Canal Zone.	65	Pittsburgh.
Idaho.....	18	Chicago.	Pennsylvania.....	66	Remainder of State.
Illinois.....	19	Remainder of State.		67	Providence.
	20	Indianapolis.	Puerto Rico.....	68	Remainder of State.
Indiana.....	21	Remainder of State.	Rhode Island.....	69	
Iowa.....	22			70	Seattle.
Kansas.....	23	Louisville.	South Carolina.....	71	Remainder of State.
Kentucky.....	24	Remainder of State.	South Dakota.....	72	Memphis.
	25		Tennessee.....	73	Remainder of State.
Louisiana.....	26	New Orleans.	Texas.....	74	Dallas.
	27	Remainder of State.		75	Houston.
Maine.....	28	Baltimore.		76	San Antonio.
Maryland.....	29	Remainder of State.	Utah.....	77	Remainder of State.
	30	Boston.	Vermont.....	78	
Massachusetts.....	31	Remainder of State.	Virginia.....	79	
	32	Detroit.	Virgin Islands.....	80	
Michigan.....	33	Remainder of State.	Washington.....	81	
	34	Minneapolis.		82	
Minnesota.....	35	St. Paul.	West Virginia.....	83	
	36	Remainder of State.	Wisconsin.....	84	
	37			85	
Mississippi.....	38	Kansas City.	Wyoming.....	86	
Missouri.....	39	St. Louis.	Blanket.....	87	
	40	Remainder of State.		88	
	41		Floaters.....	89	
Montana.....	42	Remainder of State.		90	
Nebraska.....	43			91	
Nevada.....	44			92	
New Hampshire.....	45			93	
	46			94	
	47			95	
	48			96	

WDC Form No. 1  
July 1943

No. \_\_\_\_\_

**War Damage Corporation**

(A corporation created by Reconstruction Finance Corporation pursuant to Section 34 of the Reconstruction Finance Corporation Act, as amended, herein called the "Corporation")

WASHINGTON, D. C.

1 ISSUED TO: \_\_\_\_\_  
(herein called the "Insured")

2 Mail address: \_\_\_\_\_

3 Effective date: \_\_\_\_\_

4 **In Consideration** of the payment of the premium, the Corporation agrees to indemnify the Insured, and  
 5 legal representatives, against direct physical loss of or damage to the property described in the attached application  
 6 which may result from **ENEMY ATTACK INCLUDING ANY ACTION TAKEN BY THE MILITARY, NAVAL**  
 7 **OR AIR FORCES OF THE UNITED STATES IN RESISTING ENEMY ATTACK.**

8 This insurance shall take effect on the effective date herein stated, at noon, standard time, at the place  
 9 where the property is located, and shall terminate twelve months thereafter, at the same hour.

10 The representations, terms and conditions of the application attached hereto shall be a part of this policy, and,  
 11 except as otherwise herein provided, this policy shall cover the property described in the application, for the amounts  
 12 therein stated, while located in the place(s) stated in the application, but not elsewhere.

13 Assignment of this policy shall not be valid except with the written consent of the Corporation.

14 The provisions printed on the following pages are made a part of this policy, and this policy shall also be  
 15 subject to such other provisions, stipulations and agreements as may be added hereto, over the signature of a duly  
 16 authorized Fiduciary Agent.

17 **In Witness Whereof**, the Corporation has executed this policy, but this policy shall not be valid unless  
 18 countersigned by a duly authorized Fiduciary Agent of the Corporation.

19

Attest:

*A. T. L.*  
 Secretary

WAR DAMAGE CORPORATION

*M. Clayton*  
 President

20 Countersigned this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_

21 \_\_\_\_\_  
(Authorized Fiduciary Agent)

22 By \_\_\_\_\_

**23 AMOUNT OF LOSS** The amount of loss shall not exceed the actual cash value of the property, nor the interest of the Insured therein at the time of loss, nor the amount it would cost to repair or replace the property with material of like kind and quality within a reasonable time after the loss. No allowance shall be made for compensation for loss of use, loss of profits, loss resulting from delay or deterioration, loss or impairment of market, cessation of work, fixation of price or value, interruption of business or manufacture or occupancy, or for consequential loss. No allowance shall be made for any increased cost of repair or reconstruction by reason of any ordinance or law regulating construction, use or repair.

**29 CONCEALMENT OR FRAUD** This policy shall be void if, whether before or after a loss, the Insured has wilfully concealed or misrepresented any material fact or circumstance concerning this insurance or the subject thereof, or the interest of the Insured therein, or in case of any fraud or false swearing by the Insured relating thereto.

**46 PROPERTY EXCLUDED** Unless specifically provided in writing hereon, this policy shall not cover accounts, bills, currency, deeds, evidences of debt, securities, money, bullion, stamps, furs, jewelry, precious and semi-precious stones, works of art, statuary, paintings, pictures, etchings, antiques, stamp and coin collections, manuscripts, books and printed publications more than 50 years old, models, curiosities, objects of historical or scientific interest, plane water craft, pleasure aircraft, standing timber, growing crops, orchards, or any real property which is not a part of a structure or building.

**58 PREMIUM** The premium required by the regulations of the Corporation shall be paid in full prior to the effective date. If a check is tendered in payment of premium and such check is not honored upon presentation for the full amount thereof, this policy shall be void.

**64 PERILS NOT COVERED** The Corporation shall not be liable for loss caused directly or indirectly by:

(a) blackout; burglary; robbery; theft; larceny; pilferage or looting; sabotage; vandalism or malicious mischief; or

(b) neglect of the Insured to use all reasonable means to save and preserve the property after damage resulting from the perils herein covered.

**72 PRO RATA** If any item of insurance covers blanket in or on more than one building, structure or place, the amount of insurance under such item shall attach in or on each building, structure or place in that proportion which the value of the property in or on each said building, structure or place shall bear to the value of all of the property covered by such blanket item.

**80** This pro rata distribution clause shall not apply if this policy is subject to 90% or 100% coinsurance.

**82 COINSURANCE** The Corporation shall not be liable for a greater proportion of any loss than the amount of insurance under this policy bears to the stipulated percentage of the actual cash value of the property described in the application at the time when such loss occurs. The stipulated percentage shall be

the percentage of coinsurance stated in the application. If the claim for loss is both less than \$10,000 and less than 2% of the total amount of insurance upon the property described in the application, at the time such loss occurs, no special inventory or appraisal of the undamaged property shall be required, and if the property described in the application consists of two or more items, the provisions of this paragraph shall apply to each item separately.

**96** The provisions of this coinsurance clause shall not apply to dwellings comprising less than five family units, nor to farm properties.

**99 OTHER INSURANCE** If there is any other insurance covering the property insured hereunder, whether prior to, subsequent to, or simultaneous with this insurance, which in the absence of this insurance would cover the loss or damage hereby covered, then the Corporation shall not be liable hereunder for more than the excess over and above such other insurance.

**106 MORTGAGE OR OTHER INTERESTS** If the application provides that loss hereunder shall be payable in whole or in part to a payee other than the Insured, and the Insured fails to render proof of loss within the time required by this policy, such payee shall, upon notice, as if named as the Insured herein, render proof of loss to the Corporation specified within sixty days thereafter, and shall be subject to the provisions hereof as to examination under oath, appraisal, time of payment, and bringing suit.

**115 CANCELLATION** This policy may be cancelled upon the request of the Insured, or the surrender of this policy, only in case of change of ownership of the property, or in the Insured's interest therein. If this policy is issued in violation of the regulations of the Corporation in effect at the time of issuance, this policy may be cancelled by the Corporation by delivering or mailing five days' written notice to the Insured, and to the loss payee, if any, at the address given in the application. In the event of cancellation, the net premium shall be prorated and returned in conformity with the regulations of the Corporation.

**127 REQUIREMENTS IN CASE OF LOSS** In the event of loss, the Insured shall give immediate written notice to the Corporation, furnish a complete inventory of the destroyed, damaged and undamaged property, stating the quantity, cost and actual cash value of each article and the amount claimed thereon, and file with the Corporation a proof of loss within 60 days after the loss, unless such time is extended by the Corporation in writing. Such proof of loss, signed and sworn to by the Insured, shall state the Insured's knowledge and belief as to the time and origin of the loss, the interest of the Insured and all others in the property, the actual cash value of each item thereof and the amount of loss thereto, and all contracts of insurance covering any of such property. If required, the Insured shall furnish verified plans and specifications of any buildings, fixtures or machinery destroyed or damaged; as often as may be required, exhibit to any person designated by the Corporation all that remains of any property herein covered; submit to examinations under oath by any person named by the Corporation and subscribe the same; and, as often as may be required, produce for examination all books of account, bills, invoices and other vouchers, or certified copies thereof, if originals be lost, at such reasonable time and place as may be designated by the Corporation, and permit extracts and copies thereof to be made.

**153 APPRAISAL** In case the Insured and the Corporation fail to agree as to the actual cash value or the amount of loss, then, on the written demand of either, each shall select a competent and disinterested appraiser and notify the other of the appraiser selected within twenty days after such demand. The appraisers shall first select a competent and disinterested umpire, and, in the event of their failure within fifteen days to agree upon such umpire, then, on request of the Insured or the Corporation, such umpire shall be selected by a Judge of a Federal Court of the district in which the property is located. The appraisers shall then appraise the loss, stating separately actual cash value and loss to each item; and, failing to agree, shall submit their differences, only, to the umpire. An award in writing, so itemized, of any two when filed with the Corporation shall determine the amount of actual cash value and loss. Each appraiser shall be paid by the party selecting him and the expenses of appraisal and the umpire shall be paid by the parties equally.

**172 CORPORATION'S** It shall be optional with the Corporation to take all or any part of the property at the agreed value, and also to repair, rebuild, or replace the property destroyed or damaged with other of like kind and quality within a reasonable time on giving notice of its intention so to do within thirty days after the receipt of proof of loss; but there can be no abandonment of the Corporation of any property.

**181 PAYMENT OF LOSS** Any loss shall be payable thirty days after proof of loss, as herein provided, is received by the Corporation and ascertained of the loss is made either by agreement between the Insured, mortgagee or loss payee, if any, and the Corporation, expressed in writing, or by the filing with the Corporation of an award as herein provided, and if the loss shall be payable to a payee other than the Insured, the amount of any loss shall be payable to such payee as interest may appear.

**190 SUIT** No suit or action for recovery of any claim, shall be maintainable in any court of law or equity unless all the requirements of this policy shall have been complied with, or unless commenced within six months after the date of loss.

**195 SUBROGATION** The Corporation may require from the Insured an assignment of all right of recovery against any party for loss to the extent that payment therefor is made by the Corporation.

**199 WAIVER** No permission affecting this insurance shall exist, or waiver of any provision be valid, unless granted herein or expressed in writing added hereto. No provision, stipulation or forfeiture shall be held to be waived by any requirement or proceeding on the part of the Corporation relating to appraisal or to any examination provided for herein.

**206 EXTENSION** If the Insured is unable to comply with any of the provisions of this policy applicable to a loss because of enemy action, occupation or control, the Insured's right of recovery shall not be prejudiced, provided the Insured shall comply with such provisions within a reasonable time after the Insured becomes able to do so, but in no event later than six months thereafter.

The Reconstruction Finance Corporation Act, as amended, provides:

"Sec. 16. (a) Whoever makes any statement knowing it to be false, or whoever willfully overvalues any security, for the purpose of obtaining for himself or for any applicant any loan, or extension thereof by renewal, deferment of action, or otherwise, or the acceptance, release, or substitution of security therefor, or for the purpose of influencing in any way the action of the corporation, or for the purpose of obtaining money, property, or anything of value, under this Act, shall be punished by a fine of not more than \$5,000 or by imprisonment for not more than two years, or both."

#### WAR DAMAGE CORPORATION—AMENDMENTS TO REGULATIONS A—EFFECTIVE JULY 1, 1942

##### AMENDMENT TO REGULATIONS A

1. Rule 10 of regulations A is hereby amended to read as follows:

"**RULE 10**—Policies may be issued to mortgagees or other holders of security or financial interests in property eligible for coverage under these Regulations. The rate shall be determined according to these Regulations on the basis of the coded classification of the property and risks covered and the coverage shall be subject to all the conditions of the Policy; except that, with respect to any occupancy classification to which the 'Coinsurance' clause contained in the Policy is applicable, if the Applicant shall so elect, the Applicant may apply for insurance to the full extent of its interest in the property described in the Application and in such case, the Application shall set forth the declared dollar amount of the Applicant's interest in the property therein described. The rate for such coverage shall be the highest rate applicable to property under the respective coded classification as set forth in the Rate Schedule of Appendix "A." The Fiduciary Agent shall, in any such case, attach to the Policy the following form of endorsement:

"The 'Pro Rata Distribution' clause and the 'Coinsurance' clause contained in this policy are not applicable. All other terms and conditions of this policy remain unchanged.

"By \_\_\_\_\_ (Authorized fiduciary agent)"

"If blanket policies are issued covering mortgagee or other financial interests, the provisions of these Regulations relating to 'Blanket Insurance' shall apply." (See Rule 9.)

2. The limit of coverage set forth in Rule 23 of Regulations "A" shall be inapplicable to "Furs" and "Jewelry" and such property shall be eligible for coverage without limitation. The rate for such coverage shall be the rate applicable to the appropriate coded classifications in lieu of the rate set forth under Occupancy Code 15 in the Rate Schedule of Appendix A.

3. Regulations "A" are hereby amended by adding thereto the following Rule:

**"COVERAGE FOR STANDING TIMBER"**

"RULE 26.01—Standing timber may be specifically covered, provided the Application (WDC Form No. 2) or the Schedule attached thereto sets forth separately the description, location and amount of coverage of the standing timber to be so covered. No limit of coverage shall be applicable. The rate for such coverage shall be 15 cents, with 100% coinsurance mandatory. In any such case the Fiduciary Agent shall attach to the Policy the following form of endorsement:

"This policy is hereby extended to cover the standing timber described in the Application (and the Schedule, if any) which is attached to this policy. All other terms and conditions of this policy remain unchanged."

-----  
 (Authorized fiduciary agent)  
 "By -----"

4. Rule 26 of Regulations "A" is hereby amended to read as follows:

"RULE 26—Growing crops and orchards may be specifically covered provided the separate form of Application for insurance covering growing crops and orchards is completed by the Applicant, such coverage to be at the following graduated rates: 5c for the first \$100,000, 7½c for the second, 10c for the third, 12½c for the fourth, and 15c for all coverage in excess of \$400,000; with no coinsurance requirements or credits being applicable."

**WAB DAMAGE CORPORATION AMENDMENT TO REGULATIONS A—EFFECTIVE  
OCTOBER 1, 1942**

Regulations A are hereby amended by adding thereto the following rule:

**"REGISTERED MAIL OR EXPRESS COVERAGE FOR MONEY AND SECURITIES (OCCUPANCY  
CODE 18)"**

"RULE 26.02—Money and Securities may be covered under the Policy while in transit by Registered Mail or Express (including Registered Airmail and Air Express) provided the separate form of Application (WDC Form No. 15) for such Registered Mail or Express coverage is completed by the Applicant. The terms 'Money' and 'Securities' are defined in Item 5 of said Application and the coverage limitations are set forth in Condition (b) appearing on the reverse side of said Application. The premium for such coverage will be computed on the basis of the declaration of maximum estimates of aggregate values of shipments of Money and Securities by the Applicant for the full period of twelve months from the effective date of the insurance and an adjustment will be made at the end of the term of the Policy based upon the written report of the total values of Money and Securities actually shipped by the Applicant during such term, all as described in Condition (f) appearing on the reverse side of said Application. The rates for such coverage are set forth in Item 3 of said Application, as follows: For Money, 3¢ per \$1,000 of total aggregate declared value; for Securities, 1¢ per \$1,000 of total aggregate declared value. Coverage is provided with respect to both of the following: CLASS A—Shipments made by, to, or for the account of the Applicant. CLASS B—Shipments by the Applicant for the account of others. Class A coverage is optional. Class B coverage cannot be obtained without Class A coverage. The limits of liability are \$500,000 for Money and \$2,000,000 for Securities with respect to any one shipment to any one consignee on any one day. The 'Pro Rata Distribution' clause and the 'Coinsurance' clause contained in the Policy are not applicable and all other terms and conditions of the Policy are to be considered amended and modified to the extent necessary to conform to the provisions of said Application."

## WAR DAMAGE CORPORATION

WDC Regulations "B"—July, 1942

## ACCOUNTING METHODS AND FORMS

*Application*

1. The insurance applications will be supplied in sets consisting of three numbered copies of the application proper (numbered 1, 2 and 3) and three attached tickets (numbered 4, 5 and 6), size  $3\frac{1}{2} \times 8\frac{1}{2}$  inches, which will correspond to the upper part of the application.

*Remittance by producer*

2. The producer will make out the application and ticket forms in one operation and retain the No. 3 copy of the application. No. 1 and No. 2 copies of the application and all three copies of the ticket will be mailed to the Fiduciary Agent with the remittance. (See Rule No. 3 of Regulations "A.")

*Policy system*

3. Unnumbered policies will be sent by the War Damage Corporation to only the Home Offices of each Fiduciary Agent. A receipt for these policies will be required and it is mandatory that each Fiduciary Agent certify to the Treasurer of the War Damage Corporation, Washington, D. C., the exact number of policies received. Each Fiduciary Agent will number its own policies under the uniform plan.

Policies for each authorized departmental or branch office of the Fiduciary Agent must be sent to those offices by the Home Office of each Fiduciary Agent from their supply. A receipt in duplicate for these policies must be obtained by the Home Office which will send the original receipt received from the departmental or branch office to the Treasurer of the War Damage Corporation, Washington, D. C., and retain the duplicate receipt for their files.

Each Fiduciary Agent will be assigned a code number by the War Damage Corporation. If your Company desires to appoint, under the terms and conditions of the Fiduciary Agent Agreement, departmental or branch offices to act as Fiduciary Agents, it is necessary that you advise us by telegram as to the full company name and address of such departmental or branch offices, in order that an appropriate code number may be assigned to them. Each branch or departmental office so authorized is required to follow the same accounting methods and forms covered in these instructions. The Fiduciary Agent code number will be the first one to four digits of the policy number. A dash will separate these digits from the next two digits, which will represent the state, territory, possession, or coded city. Another dash will separate these two digits from the policy number. This number system would then result in the following, for example: "1335-49-10152." This would indicate Fiduciary Agent No. 1335; policy issued in State No. 49; policy No. 10152.

Each Fiduciary Agent will number policies starting with 101 for each state, possession, territory, coded city, Blanket policy series and Floater policy series.

The policies will be furnished without daily reports and the Fiduciary Agent's copy of the application, filed in numerical order, will be its daily report.

*Spoiled policies*

4. EVERY POLICY FURNISHED BY THE WAR DAMAGE CORPORATION MUST BE ACCOUNTED FOR. SPOILED POLICIES MUST, THEREFORE, BE RETAINED EVEN THOUGH UNNUMBERED.

*Distribution of applications and tickets*

5. The copies of the application and tickets with schedules (WDC Form 11), where required, attached to each, will be used as follows:

The No. 1 copy (original of application) is to be attached to the policy.

The No. 2 copy will be retained by the Fiduciary Agent in a numerical file.

The No. 3 copy will be retained by the producer.

The No. 4 copy (ticket) will be forwarded to the nearest Federal Reserve Bank or Branch, Custodian, for its numerical file. (See paragraph No. 7.) A list of such Federal Reserve Banks or Branches is attached.

The No. 5 copy (ticket) will be forwarded to the Federal Reserve Bank or Branch, Custodian, for its alphabetical file. (See paragraph No. 7 hereof.)

The No. 6 copy (ticket) will be used by the Fiduciary Agent for compilation of statistics and producer's commissions.

All copies received by the Fiduciary Agent must have the policy number and insurance effective date inserted, but the date on which premium is deposited need be placed only on the numbered 2 and 4 copies.

#### *Deposits*

6. Deposit slips covering deposits by the Fiduciary Agent in its "War Damage Account" shall be made in duplicate and shall show on the duplicate slip only, the policy number opposite the related remittance.

The duplicate deposit slips are to be retained in chronological order by the Fiduciary Agent. (See paragraph 4 of Fiduciary Agent Agreement.)

#### *Remittances to War Damage Corporation and account summary*

7. Remittances to War Damage Corporation without supporting details shall be made not less frequently than once a week by the Fiduciary Agent to the Federal Reserve Bank, Custodian, for the account of the War Damage Corporation, provided that monies may be maintained with the approval of the Corporation sufficient to enable the Fiduciary Agent to carry on its daily operations and activities hereunder commensurate with the volume of business transacted by it. An account summary (WDC Form No. 12—to be furnished by the War Damage Corporation) shall be prepared as at the close of business each month and shall be submitted to the Federal Reserve Bank, Custodian, accompanied by the numbered 4 and 5 copies of the tickets, as soon as possible thereafter but not later than the 20th of the month following that for which the report is made. The tickets (keep both copies together) must be arranged according to premium groups on account summary. The account summary is to be prepared on the prescribed Form WDC-12. (Sample attached)

#### *Statistical report*

8. A certified statistical report, illustrated below, shall be submitted by the Fiduciary Agent to the Federal Reserve Bank, Custodian, to which it remits, not later than the 20th of each month as of the close of the preceding month, reflecting the amounts of insurance then in force by class of risk and by states or territories, possessions, and coded cities. This report may be filed on a group basis by companies operating as a group, provided such group report is made only to the Federal Reserve Bank, Custodian, to which the group members remit and covers only data relating to insurance reported to that Federal Reserve Bank, Custodian; and provided further that the report shows the names of companies comprising the group and their code numbers. (See paragraph 5 of the Fiduciary Agent Agreement, and Rule 9 of Regulations "A")

#### *Summary of insurance in force by occupancy classes, by States, Territories, possessions, and coded cities*

(To nearest \$1,000)

State, etc.	Occupancy classes (per attached exhibit)			
	01	02	03	Etc.
Alabama.....				
Alaska.....				
Arizona.....				
Los Angeles.....				
Oakland.....				
San Francisco.....				
Remainder of California.....				
Denver.....				
Remainder of Colorado.....				
Etc.....				

NOTE.—Applications covering property located in more than 1 State will be supported by schedules showing approximate coverage in each State and city, etc., and shall be allocated by State, cities, etc., in the above-mentioned statistical report.

#### *Cancellations*

9. Whenever there is an authorized cancellation, either the cancelled policy or the cancellation notice is to be attached to the Fiduciary Agent's copy of the application. The War Damage Corporation will supply credit tickets numbered 4,

5, and 6 (WDC Form No. 13), which are to be filled out by the Fiduciary Agent on all return premiums and distribution made as previously outlined. (See Rule No. 6 of Regulations "A")

*Additions and reductions*

10. Special application forms (WDC Forms 9 and 8) are provided for additional insurance as well as reductions in insurance as distinguished from cancellations. (See Rule No. 8 of Regulations "A")

*Waiver of additional premiums or return premiums*

11. Where the additional return premium is less than fifty cents (50¢) no payment shall be made. (See Rule No. 8 of Regulations "A")

*Discrepancies*

12. Remittances based on erroneous premium computations shown on insurance applications may be accepted as correct by the Fiduciary Agent if the deviation is fifty cents (50¢) or less.

*Verification*

13. The Fiduciary Agent is required to review the description of coverage to determine the accuracy of the rate used and to verify the computations of premiums and commissions. (See paragraph No. 2 of Fiduciary Agent Agreement)

*Record of expenses*

14. In order to record the War Damage Corporation expenses each Fiduciary Agent will set up a record of War Damage Corporation expenses analyzed as to the usual accounts shown in the annual statement, such as salaries, postage, etc., these figures to be supported by properly approved vouchers. Salaries should be supported by suitable time vouchers. This information will be subject to call by War Damage Corporation, in accordance with Paragraph 3 of the Fiduciary Agent Agreement.

*Fees on additions*

15. Neither a producer's service fee (commission) nor a Fiduciary Agent's expense reimbursement fee will be paid on additional premiums. (See Rule No. 8 of Regulations "A")

*Codes*

16. The following codes, etc., are attached:

Appendix A—Rate Schedule, including Occupancy Code and Construction Code and Alphabetical Occupancy Code  
States, Territories and Possessions, and Cities Code  
List of Federal Reserve Banks and Branch Banks, Custodians.

*Calculation of return premiums*

17. All fees are earned when applications are accepted. In calculating return premiums, the total of fees paid, 5% and 3½% (subject to minimum and maximum rules), is to be deducted from total premiums paid and pro rata calculations are to be based on net premiums (See Rule No. 7 of Regulations "A")

WDC Form No. 12  
July 1942

## WAR DAMAGE CORPORATION

Fiduciary agent -----

Address -----

Month of ----- 19\_\_\_\_ Code No. -----

*Account summary*

Premium Groups	Number of Policies	Fiduciary Agent's Fee	Gross Premium
Under \$14.29.....	XXXXXXXXXXXX	\$.....	\$.....
\$14.29 to \$20,000.00.....	XXXXXXXXXXXX		
Above \$20,000.00.....			
Adjustments (+ or -)..... (Itemize on reverse side hereof)			
<b>Totals.....</b>	<b>XXXXXXXXXXXX</b>	<b>\$.....</b>	<b>\$.....</b>
<b>ADD:</b>			
Additional premiums.....		\$.....	
Other income (itemize, if any, on reverse side hereof).....			
<b>Total Income.....</b>			<b>\$.....</b>
<b>DEDUCT—DISBURSEMENTS:</b>			
Return premiums.....		\$.....	
Commissions (Producers' Fees) per tickets.....			
Fiduciary Agent's Fees (above).....			
Other disbursements (itemize if any).....			
Payments to Federal Reserve Bank:.....			
	\$.....		
<b>Total Disbursements.....</b>			<b>\$.....</b>
<b>BALANCE DUE WAR DAMAGE CORPORATION.....</b>			<b>\$.....</b>

The foregoing is certified to be true and correct.

Date ----- By -----  
Authorized Signature

## LIST OF FEDERAL RESERVE BANKS AND BRANCH BANKS (CUSTODIANS)

Federal Reserve Bank of Atlanta, Atlanta, Georgia  
 Birmingham Branch, Federal Reserve Bank of Atlanta, Birmingham, Alabama  
 Federal Reserve Bank of Boston, Boston, Massachusetts  
 Charlotte Branch, Federal Reserve Bank of Richmond, Charlotte, North Carolina  
 Federal Reserve Bank of Chicago, Chicago, Illinois  
 Federal Reserve Bank of Cleveland, Cleveland, Ohio  
 Federal Reserve Bank of Dallas, Dallas, Texas  
 Denver Branch, Federal Reserve Bank of Kansas City, Denver, Colorado  
 Detroit Branch, Federal Reserve Bank of Chicago, Detroit, Michigan  
 Helena Branch, Federal Reserve Bank of Minneapolis, Helena, Montana  
 Houston Branch, Federal Reserve Bank of Dallas, Houston, Texas  
 Jacksonville Branch, Federal Reserve Bank of Atlanta, Jacksonville, Florida  
 Federal Reserve Bank of Kansas City, Kansas City, Missouri  
 Little Rock Branch, Federal Reserve Bank of St. Louis, Little Rock, Arkansas  
 Los Angeles Branch, Federal Reserve Bank of San Francisco, Los Angeles, California  
 Louisville Branch, Federal Reserve Bank of St. Louis, Louisville, Kentucky  
 Memphis Branch, Federal Reserve Bank of St. Louis, Memphis, Tennessee  
 Federal Reserve Bank of Minneapolis, Minneapolis, Minnesota  
 Nashville Branch, Federal Reserve Bank of Atlanta, Nashville, Tennessee  
 New Orleans Branch, Federal Reserve Bank of Atlanta, New Orleans, Louisiana  
 Federal Reserve Bank of New York, Federal Reserve Post Office Station, New York, New York  
 Oklahoma City Branch, Federal Reserve Bank of Kansas City, Oklahoma City, Oklahoma

Omaha Branch, Federal Reserve Bank of Kansas City, Omaha, Nebraska  
 Federal Reserve Bank of Philadelphia, Philadelphia, Pennsylvania  
 Portland Branch, Federal Reserve Bank of San Francisco, Portland, Oregon  
 Federal Reserve Bank of Richmond, Richmond, Virginia  
 Federal Reserve Bank of St. Louis, St. Louis, Missouri  
 Salt Lake City Branch, Federal Reserve Bank of San Francisco, Salt Lake City, Utah  
 San Antonio Branch, Federal Reserve Bank of Dallas, San Antonio, Texas  
 Federal Reserve Bank of San Francisco, San Francisco, California  
 Seattle Branch, Federal Reserve Bank of San Francisco, Seattle, Washington  
 Spokane Office of the Seattle Branch, Federal Reserve Bank of San Francisco, Spokane, Washington

#### APPENDIX A

*Rate schedule—See pages 2 to 5 inclusive.*

##### *Construction code*

For the purpose of determining rates for coverage, risks shall be coded as to construction as follows:

Coverage on or in buildings or structures of fire resistive construction according to fire insurance standards-----	Code 1
Coverage on or in buildings or structures of any other construction, and property in the open-----	Code 2

In the case of a risk composed of different classes of construction, if not less than 75% of the total floor area (including basements) is of one class of construction, the risk may be coded according to such predominating class of construction. Otherwise, such risk must take the class rate of the higher rated class of construction. (See Rule 20.)

(The term "risk" as used herein may be construed to mean a single building, or a group of buildings, and contents situated at one location.)

##### *Coinsurance credits*

Rates are based upon the use of the 50% Coinsurance clause, which is the minimum permissible, except as otherwise specifically provided herein:

For 80% Coinsurance clause, deduct 30% from the base rate.

For 90% Coinsurance clause, deduct 35% from the base rate.

For 100% Coinsurance clause, deduct 40% from the base rate.

##### *Sprinkler credit*

If not less than 75% of the total floor area (including basements) of the risk is equipped with a system of automatic sprinklers, deduct 10% from the base rate.

##### *Blanket policies*

Blanket policies take the rate of the highest rated building or location. (See Rule 9.)

## Rate schedule

Rates are for building and contents unless otherwise noted

Minimum premium of \$3.00 per policy

NS—without automatic sprinklers S—with automatic sprinklers	Occu- pancy Code Number	Construc- tion Code Number	ANNUAL RATES PER \$100 OF INSURANCE				
			No Coinsur- ance	With Coinsurance of			
				50%	80%	90%	100%
Dwellings and their contents..... (Dwellings comprising less than five family units including private garages, out-buildings and private passenger automobiles.) (Use Ap- plication WDC Form No. 2.)	01	1 or 2	\$0.10	Coinsurance does not apply			
Farm properties and their contents..... (Farm property and their con- tents shall include private garages, private barns and out-buildings, farm implements, livestock, and motor vehicles used for farm or pleasure purposes.) (Use Applica- tion WDC Form No. 2.)	02	1 or 2	.10	Coinsurance does not apply			
Churches, hospitals, educational or cultural institutions, libraries, mu- seums, public buildings (Use Appli- cation WDC Form No. 2.)	{ NS 03 S 03 NS 03 S 03	1 1 2 2	\$.10 .09 .15 .135	\$0.07 .063 .105 .095	\$0.065 .059 .098 .088	\$0.064 .05 .09 .081	
Apartments, hotels, offices, mercan- tiles, warehouses and other build- ings not used for manufacturing (Use Application WDC Form No. 2.)	{ NS 04 S 04 NS 04 S 04	1 1 2 2	.15 .135 .20 .18	.105 .095 .14 .126	.098 .088 .13 .117	.09 .081 .12 .108	
Manufacturing plants, piers, wharves, bridges, and structures not otherwise specifically provided for (Use Appli- cation WDC Form No. 2.)	{ NS 05 S 05 NS 05 S 05	1 1 2 2	.20 .18 .30 .27	.14 .126 .21 .189	.13 .117 .195 .176	.12 .108 .18 .162	
Street railway and railroad properties (except trackage and roadbeds and rolling stock and their contents.) (Use Application WDC Form No. 2.)	{ NS 06 S 06	1 or 2 1 or 2	.30 .27	.21 .189	.195 .176	.18 .162	
Rolling stock (Use Application WDC Form No. 2.)	07	-----	-----	.25	.175	.163	.15
Trackage and road beds (Use Applica- tion WDC Form No. 2.)	08	-----	-----	.10	.07	.065	.06
Builders' risk shall take the rate appli- cable to the completed building or structure (use application WDC Form No. 2.)	-----	-----	-----	-----	-----	-----	-----
Floater (Floater policies shall cover movable property at any location but shall not cover while in transit) (use application WDC Form No. 2.)	09	-----	100% Coinsurance Mandatory	-----	-----	-----	.25
Motor vehicles except those herein- above provided for under Dwellings and Farm Properties (use applica- tion WDC Form No. 2.)	10	-----	-----	.25	.175	.163	.15
Growing crops and orchards (use appli- cation WDC Form No. 7)	11	-----	.05	Coinsurance does not apply			
Transit Risks (use application WDC Form No. 3)	12	-----	.03	Coinsurance does not apply			
Insurance to be applied for on the basis of:							
(a) the highest of items (a), (b), and (c) of the Application in the case of a 12 months' policy; or							
(b) item (d) of the Application in the case of a 3 months' policy issued to an appli- cant who has been in busi- ness for less than 3 months; or							
(c) item (e) of the Application in the case of a trip risk.							
Vessels:							
Commercial hulls:							
All metal (including hull, deck and superstructure)	13	1	.50	Coinsurance does not apply			
Others (use application WDC Form No. 6)	13	2	.75	Coinsurance does not apply			

*Rate Schedule—Continued*

Rates are for building and contents unless otherwise noted

Minimum premium of \$3.00 per policy

NS—without automatic sprinklers S—with automatic sprinklers	Occu- pancy Code Number	Construc- tion Code Number	ANNUAL RATES PER \$100 OF INSURANCE				
			No Coinsur- ance	With Coinsurance of			
				50%	80%	90%	100%
<b>Vessels—Continued</b>							
Builders' risk:							
All Metal (including hull, deck and superstructure) .....	13	1	\$0.25	Coinsurance does not apply			
Others (use application WDC Form No. 4) .....	13	2	.375	Coinsurance does not apply			
(Premiums calculated on com- pleted price.)							
<b>Cargo Stored Afloat:</b>							
All Metal (including hull, deck, and superstructure) (use appli- cation WDC Form No. 5) .....	13	1	.50	Coinsurance does not apply			
Others (use application WDC Form No. 5) .....	13	2	.75	Coinsurance does not apply			
Publicly or privately owned utilities, such as light, water, heat, power and communication systems, including transmission lines, underground pip- ing, wiring and conduits (use appli- cation WDC Form No. 2) .....	14	1 or 2	-----	\$0.30	\$0.21	\$0.195	\$0.18
Furs, jewelry, art objects, and the like (use application WDC Form No. 2) ..	15	1 or 2	.75	Coinsurance does not apply			
Pleasure aircraft or pleasure water craft (use application WDC Form No. 2) ..	16	1 or 2	-----	.25	.175	.163	.15

The Reconstruction Finance Corporation Act, as amended, provides:

SEC. 16. (a) Whoever makes any statement knowing it to be false, or whoever willfully overvalues any security, for the purpose of obtaining for himself or for any applicant any loan, or extension thereof by renewal, deferment of action, or otherwise, or the acceptance, release, or substitution of security therefor, or for the purpose of influencing in any way the action of the corporation, or for the purpose of obtaining money, property, or anything of value, under this Act, shall be punished by a fine of not more than \$5,000 or by imprisonment for not more than two years, or both.

## WAB DAMAGE CORPORATION

## Occupancy Codes—Alphabetical

16 Aircraft—pleasure	03 Libraries
15 Antiques	05 Manufacturing plants
04 Apartments	04 Mercantile risks—buildings and contents
01 Automobiles—garaged with city dwellings	15 Models
02 Automobiles—garaged with farm properties	— Motor vehicles—see Automobiles
10 Automobiles—commercial	03 Museums—buildings and contents consisting of furniture, fixtures, machinery and equipment, and supplies
15 Books and printed publications more than 50 years old	15 Museums—contents other than furniture, fixtures, machinery and equipment, and supplies
05 Bridges	15 Objects of historical or scientific interest
— Builders' risks—(buildings under construction)—same code as completed building	04 Office buildings and contents
13 Builders' risks—hulls	11 Orchards
04 Buildings—non-manufacturing	15 Paintings
13 Cargo of vessels	15 Pictures
03 Churches	05 Piers
15 Coin collections	03 Public buildings and contents
— Contents take class of building code	14 Public or private utilities
11 Crops	06 Railroad properties—except rolling stock, trackage and roadbed
15 Curiosities	07 Railroad rolling stock
01 Dwellings—less than 5 families—other than farm	08 Railroad trackage and roadbed
02 Dwellings—farm	15 Stamp collections
04 Dwellings—5 families or more	15 Statuary
03 Educational institutions	06 Street railway properties—except rolling stock, trackage and roadbed
15 Etchings	07 Street railway rolling stock
02 Farm buildings and contents—including livestock	08 Street railway trackage and roadbed
09 Floaters	08 Trackage and roadbed
15 Furs	12 Transit risks
01 Garages—private	13 Vessels and cargo
04 Garages—public	04 Warehouses—buildings and contents
11 Growing crops	16 Water craft—pleasure
03 Hospitals	05 Wharfs
04 Hotels	15 Works of art
01 Household furniture in dwellings under 5 families	16 Yachts
04 Household furniture in dwellings 5 families and over	
13 Hulls—completed	
13 Hulls—builders' risk	
15 Jewelry	

## CODED CITY, STATE, TERRITORY AND POSSESSIONS CODES

Alabama -----	01	Birmingham
	02	Remainder of State
Alaska -----	03	
Arizona -----	04	
Arkansas -----	05	
California -----	06	Los Angeles
	07	Oakland
	08	San Francisco
	09	Remainder of State
Colorado -----	10	Denver
	11	Remainder of State
Connecticut -----	12	
Delaware -----	13	
District of Columbia -----	14	
Florida -----	15	

## CODED CITY, STATE, TERRITORY AND POSSESSIONS CODES—Continued

Georgia -----	17	Atlanta
	18	Remainder of State
Hawaiian Islands -----	19	
Idaho -----	20	
Illinois -----	21	Chicago
	22	Remainder of State
Indiana -----	23	Indianapolis
	24	Remainder of State
Iowa -----	25	
Kansas -----	26	
Kentucky -----	27	Louisville
	28	Remainder of State
Louisiana -----	29	New Orleans
	30	Remainder of State
Maine -----	31	
Maryland -----	32	Baltimore
	33	Remainder of State
Massachusetts -----	34	Boston
	35	Remainder of State
Michigan -----	36	Detroit
	37	Remainder of State
Minnesota -----	38	Minneapolis
	39	St. Paul
	40	Remainder of State
Mississippi -----	41	
Missouri -----	42	Kansas City
	43	St. Louis
	44	Remainder of State
Montana -----	45	
Nebraska -----	46	
Nevada -----	47	
New Hampshire -----	48	
New Jersey -----	49	Jersey City
	50	Newark
	51	Remainder of State
New Mexico -----	52	
New York -----	53	Buffalo
	54	New York City
	55	Rochester
	56	Remainder of State
North Carolina -----	57	
North Dakota -----	58	
Ohio -----	59	Cincinnati
	60	Cleveland
	61	Columbus
	62	Toledo
	63	Remainder of State
Oklahoma -----	64	
Oregon -----	65	Portland
	66	Remainder of State
Panama Canal Zone -----	67	
Pennsylvania -----	68	Philadelphia
	69	Pittsburgh
	70	Remainder of State
Puerto Rico -----	71	
Rhode Island -----	72	Providence
	73	Remainder of State
South Carolina -----	74	
South Dakota -----	75	
Tennessee -----	76	Memphis
	77	Remainder of State

## CODED CITY, STATE, TERRITORY AND POSSESSIONS CODES—Continued

Texas -----	78	Dallas
	79	Houston
	80	San Antonio
	81	Remainder of State
Utah -----	82	
Vermont -----	83	
Virginia -----	84	
Virgin Islands -----	85	
Washington -----	86	Seattle
	87	Remainder of State
West Virginia -----	88	
Wisconsin -----	89	Milwaukee
	90	Remainder of State
Wyoming -----	91	
Blanket -----	99	(Allocate by cities and States)
Floaters -----	15	

WAR DAMAGE CORPORATION SUPPLEMENT TO REGULATIONS B—EFFECTIVE  
JULY 1, 1943

## APPLICATION FOR RENEWAL

*Application for renewal (WDC Form No. 19)*

1. The Application for Renewal will be supplied in sets of six, numbered 1, 2, 3, 4, 5 and 6, size  $3\frac{1}{2} \times 8\frac{1}{4}$  inches.

*Remittance by producer*

2. The Producer will complete the Application for Renewal, WDC Form No. 19 (six copies in one operation) and detach the No. 3 copy for his records. The No. 1, 2, 4, 5 and 6 copies of the Application will be mailed to the Fiduciary Agent with the appropriate remittance.

*Disposition of copies of application for renewal (WDC Form No. 19)*

3. The six copies of the Application for Renewal (WDC Form No. 19) will be used as follows:

The No. 1 (original) for attachment to the Policy after it is signed by the Fiduciary Agent and returned to the Applicant through the Producer.

The No. 2 copy will be attached to the No. 2 copy of the original Application for insurance retained by the Fiduciary Agent.

The No. 3 copy will be retained by the Producer as his record.

The No. 4 copy will be forwarded by the Fiduciary Agent to the appropriate Custodian for its numerical file.

The No. 5 copy will be forwarded to the appropriate Custodian for its alphabetical file.

The No. 6 copy will be used by the Fiduciary Agent for transmittal with Producer's commission.

*Deposit*

4. The date on which the Renewal premium is deposited must be placed on No. 2 and 4 copies of the Application for Renewal (WDC Form No. 19). Deposit slips covering deposits by the Fiduciary Agent in its "War Damage Account" shall be made in duplicate and shall show, only on the duplicate slip, the Policy number opposite the related remittance.

The duplicate deposit slips are to be retained in chronological order by the Fiduciary Agent.

*Remittances to War Damage Corporation and account summary*

5. Same as Section No. 7 WDC Regulations "B" July 1942. (See Memorandum to Fiduciary Agents No. 7 dated Sept. 4, 1942 and No. 17 dated Nov. 24, 1942.)

*Statistical report*

6. Same as Section No. 8 WDC Regulations "B" July 1942. (See Memoranda to Fiduciary Agents No. 3 dated July 14, 1942, paragraphs 1, 2, and 3; and No. 8 dated September 15, 1942, paragraphs 1 and 2.)

Beginning with the July 1943 account, the Fiduciary Agents will prepare monthly the policy tabulation required in Memorandum to Fiduciary Agents

(General Program) No. 23 dated January 9, 1943, and, in addition, there shall be prepared monthly a separate tabulation of the number of policies renewed by Application for Renewal (WDC Form No. 19) for each coded geographical location (including Floater Code No. 15).

#### *Cancellation*

7. Same as Section No. 9 WDC Regulations "B" July 1942 (See Memoranda to Fiduciary Agents: No. 5 dated July 24, 1942, paragraph 11; No. 6 dated July 25, 1942, paragraphs 7 and 8; No. 12 dated September 25, 1942; and No. 16 dated November 17, 1942, paragraphs 4 and 7; and No. 27 dated March 3, 1943).

#### *Additions and reductions*

8. Same as Section No. 10 WDC Regulations "B" July 1942 (See Memoranda to Fiduciary Agents: No. 12 dated September 25, 1942; No. 16 dated November 17, 1942, paragraph 5; and No. 25 dated January 18, 1943; and No. 27 dated March 3, 1943).

#### *Waiver of additional premiums and return premiums*

9. Same as Section No. 11 WDC Regulations "B" July 1942 (See Memorandum to Fiduciary Agents No. 16 dated November 17, 1942, paragraph 5).

#### *Discrepancies*

10. Same in Section No. 12 WDC Regulations "B" July 1942 (See Memorandum to Fiduciary Agents No. 12 dated September 25, 1942, paragraph 4).

#### *Verification*

11. The Fiduciary Agent is required to see that the premium on the Application for Renewal (WDC Form No. 19) agrees with the premium on the original Application for insurance, and that the computation of Producer's commission is correct.

#### *Record of expenses*

12. Same as Section No. 14 WDC Regulations "B" July 1942 (See Memoranda to Fiduciary Agents: No. 5 dated July 24, 1942, paragraph 9; and No. 18 dated December 2, 1942).

#### *Fees on additions*

13. Same as Section No. 15 WDC Regulations "B" July 1942.

#### *Codes*

14. Same as Section No. 16 WDC Regulations "B" July 1942 (See Memorandum to Fiduciary Agents No. 3 dated July 14, 1942, paragraphs 1, 2 and 3).

#### *Calculation of return premiums*

15. Same as Section No. 17 WDC Regulations "B" July 1942 (See Memoranda to Fiduciary Agents: No. 5 dated July 24, 1942, paragraph 11; No. 6 dated July 25, 1942, paragraphs 7 and 8; No. 12 dated September 25, 1942, paragraphs 1, 3, 7 and 8; and No. 16 dated November 17, 1942, paragraphs 4 and 7).

#### *Important*

16. This Application for Renewal (WDC Form No. 19) shall not be used if any change has been made in the insurance as originally effected; nor shall it be used if any change in existing coverage is required on Renewal (A new completed Application should be submitted in any such case, or in any case where Blanket Code 99 applies or where Schedule WDC Form No. 11 is required).

A new completed Application for insurance shall be submitted in any case where the original insurance was effected under WDC Application Forms No. 3, 3 (a), 4 or 15.

### SUPPLEMENT TO REGULATIONS B

#### AMENDMENTS

The last sentence of Section 16 of the Supplement to WDC Regulations "B", effective July 1, 1943, is hereby amended to strike therefrom the numeral "4" so that the same will read as follows:

A new completed Application for insurance shall be submitted in any case where the original insurance was effected under WDC Application Forms Nos. 3, 3 (a), or 15.

WDC Regulations "B" are further amended to provide that receipts for policies sent by home offices to coded branch offices need not be forwarded to the office of this Corporation in Washington inasmuch as the home office is accountable,

and receipts for, all policy stock shipped to it. [Memorandum to Fiduciary Agents No. 31, May 22, 1943.]

# ADDENDUM TO SUPPLEMENT TO REGULATIONS "B"

## ACCOUNTING INSTRUCTIONS RELATING TO INTERIM POLICIES

Pursuant to Item 4 of Memorandum to Fiduciary Agents No. 34, Fiduciary Agents are advised that "Deposit Premiums" received should be deposited in the War Damage Account, from which remittances should be made periodically to the Federal Reserve Bank in the customary manner.

No deduction for producer's commission or Fiduciary Agent's fee should be made at that time, inasmuch as the amount thereof will not be determined until the Interim policy is closed out. Consequently, the gross deposit premium will be remitted to the Federal Reserve Bank, without deduction of any kind, and reported separately on your Account Summary (WDC Form No. 12) as follows:

a. The aggregate amount of deposit premiums received during the month will be shown on the "adjustments" line of the upper section of Form WDC 12 (as separate items from any other adjustments included in the report), extended to the gross premium column, and identified on the reverse of Form WDC 12 by scheduling in columns in the following manner:

Policy #	Expiration date	Aggregate Coverage	Premium Deposited
----------	-----------------	--------------------	-------------------

The geographical code number 99 may be used in the policy number but no breakdown into coded geographical locations is required.

b. Upon determination of the amount of deposit premiums to be returned, Fiduciary Agents should effect an appropriate refund from the War Damage Account, and, in the event funds on deposit therein are insufficient, should obtain an advance from the Federal Reserve Bank for that purpose in the same manner as provided in paragraph 2 of Memorandum to Fiduciary Agents No. 7. The amount returned to the insured should be reflected on the Account Summary (WDC Form 12), for the month in which returned, on an inserted line to be placed immediately below the "Return Premiums" line, and designated "Deposit Premiums Returned".

c. Producers' commissions and Fiduciary Agents' fees on the deposit premium retained by the Corporation may then be computed and paid, and included in the "Commissions" and "Fees" lines of WDC Form 12 in the usual manner. If the funds in the War Damage Account should be insufficient to permit their payment, an advance may be obtained from the Federal Reserve Bank for that purpose as authorized in (b) above.

d. Interim policies closed out should be identified on the reverse of WDC Form 12 under the general caption "Interim Policies Closed Out", scheduling thereunder, in columnar form, the following data:

Policy Number	Original Coverage	Original Deposit Premium	Coverage Renewed by Mortgageors	Earned Premium Retained
---------------	-------------------	--------------------------	---------------------------------	-------------------------

e. The Account Summary (WDC Form 12) should be supported in each instance by the number 4 and 5 tickets from the related WDC Application Form No. 2 and WDC Application Form No. 14, to which should be attached a copy of the requisite schedule. To facilitate identification in the Custodian's office, each ticket should be plainly marked with large letters "INTERIM POLICY". The Occupancy and Construction Code, Coinsurance and Sprinkler Credit blocks of line 4 of the Application forms need not be filled in.

Fiduciary Agents are advised that coverage represented by interim policies should NOT be included in the monthly statistical report of insurance in force, and that such policies should NOT be included in the monthly tabulation of policies issued. [Memorandum to Fiduciary Agents No. 35, June 5, 1943.]

# ADDENDUM TO REGULATIONS "B" AND SUPPLEMENT TO REGULATIONS "B"

## REMITTANCE OF EXCESS FIDUCIARY AGENTS' FEES

Reference is made to Memorandum to Fiduciary Agents (General Program) No. 21, dated December 29, 1942, transmitting copies of correspondence between War Damage Corporation and the Bureau of Internal Revenue with respect to the taxability of the expense reimbursement paid by War Damage Corporation to Fiduciary Agents pursuant to the provisions of the "Fiduciary Agent Agreement". As indicated therein, the tax ruling issued by the Bureau was predicated

upon the assumption that a mutually satisfactory adjustment would be made between the Fiduciary Agents and War Damage Corporation which would result in each Fiduciary Agent receiving at the termination of the program reimbursement for only those allowable expenses which have been actually incurred by it, with no resulting profit whatsoever.

In order to give effect to the foregoing, it has been determined by War Damage Corporation to be desirable that periodic adjustments be made with each Fiduciary Agent as hereinafter provided. Paragraph 3 of the Fiduciary Agent Agreement, defines the allowable expenses as covering without profit the direct, actual, and necessary expenses of the Fiduciary Agent in connection with its operations and activities thereunder, exclusive of any expenses for executive management or expenses normally incident to its regular business. Paragraph 14 of WDC Regulations "B" requires each Fiduciary Agent to set up a record of expenses analyzed as to usual accounts shown on the annual statement, such as salaries, postage, etc., these figures to be supported by properly approved vouchers.

Fiduciary Agents are hereby requested, immediately after the close of business on May 31, 1943, to:

(a) estimate the amount of such allowable expenses expected to be incurred during June, 1943;

(b) add the amount of the June estimate to the cumulative amount of allowable expenses incurred for the period July 1, 1942 through May 31, 1943;

(c) remit forthwith to the Custodian Bank the amount (if any) by which the aggregate expense reimbursements deducted through May 31, 1943, exceeds the amount of allowable expenses determined under item (b) above. Such remittance should not be included in the Account Summary (WDC Form 12).

Fiduciary Agents are further requested, as soon as practicable after the close of business on May 31, 1943, to transmit to the Custodian Bank a statement, in duplicate (accompanied by the above-mentioned remittance, if any) certified to by an appropriate officer of the Fiduciary Agent, setting forth under the several classifications the amount of expenses incurred through May, 1943, and expenses estimated for June, 1943. Such statement should be lodged with the Custodian Bank irrespective of whether the amount of expense reimbursements theretofore deducted is greater or less than the amount of the allowable expenses actually incurred. In the interest of uniformity, statements shall be submitted in form similar to the specimen attached and shall be subject to audit in the same manner as other records of the Fiduciary Agents under the Fiduciary Agent Agreement. In the event the amount of allowable expenses reflected in such statement exceeds the amount of expense reimbursements therein reflected, War Damage Corporation will forthwith remit to the Fiduciary Agent the amount of such excess. The amount of the allowable expenses estimated for June, 1943, shall be subject to later adjustment based upon the amount of actual allowable expenses incurred and, similarly, the amount of any such remittance, either to or from the Fiduciary Agent, shall be subject to later adjustment after audit. Future expense adjustments under the program will be made from time to time as circumstances require. [Memorandum to Fiduciary Agents No. 32, May 25, 1943.]

Memorandum to Fiduciary Agents (General Program) No. 56 advised of the termination of this Corporation's premium insurance program, effective March 16, 1946.

Accordingly it is now desired to make a final call for submission of excess Fiduciary Agents' fees in order to comply with the ruling of the Bureau of Internal Revenue as set forth in Memorandum to Fiduciary Agents No. 21 and in accordance with the intent of paragraph 3 of the Fiduciary Agent Agreement, which defines allowable expenses as covering, without profit, the direct, actual and necessary expenses of the Fiduciary Agent in connection with its operations and activities under the Agreement, and exclusive of any expenses for executive management or expenses normally incident to its regular business.

You are, therefore, hereby requested to determine as of March 16, 1946, the net aggregate amount of Fiduciary Agent expense reimbursements through March 15, 1946, and remit to the Custodian Banks the amount, if any, by which

the net aggregate expense reimbursements collected from July 1, 1942, exceed the aggregate of allowable expenses as indicated by your records.

You are also requested to prepare a statement in duplicate, in a form similar to the specimen attached, certified to by an appropriate officer, setting forth under the several classifications the amount of allowable expenses incurred for the period July 1, 1942 through March 15, 1946. Such statements should be lodged with the Custodian Bank, irrespective of whether the amount of expense reimbursements theretofore deducted is greater or less than the amount of allowable expenses incurred.

The statement should be accompanied by remittance of any excess fees collected and, where the statement discloses a balance due the Fiduciary Agent, settlement thereof will be made by War Damage Corporation with the Fiduciary Agent. [Memorandum to Fiduciary Agents No. 57, April 4, 1946.]

#### ATTACHMENT TO MEMORANDUM TO FIDUCIARY AGENTS No. 57, APRIL 4, 1946

To the Federal Reserve Bank of -----

We hereby certify that Fiduciary Agent Expense Reimbursements deducted in accordance with paragraph 3 of the Fiduciary Agent Agreement, and allowable expenses incurred thereunder, are as follows:

Fiduciary Agent's Expense Reimbursements Withheld July 1, 1942, through March 15, 1946		\$-----
Add: Remittances (if any) from WDC for allowable expense	-----	
Deduct: Remittances to WDC for excess expense reimbursements	-----	
Net aggregate Fiduciary Agent's Expense Reimbursements collected through March 15, 1946	-----	
Deduct (1) Allowable expenses actually incurred July 1, 1942, through March 15, 1946:		
Salaries and Wages (Other than salaries which would have been paid in the normal course of business):		
Regular	\$-----	\$-----
Overtime	-----	-----
Printing, stationery and supplies	-----	-----
Postage and express	-----	-----
Telephone and telegraph	-----	-----
Other (list each type of expense separately)	-----	-----
	-----	-----
	-----	-----
	-----	-----
Balance (Due WDC or Fiduciary Agent)	-----	-----
	(Fiduciary Agent (Name) (Code No.))	
By	-----	
	(Title)	

Date ----- 19--

#### ADDENDUM TO REGULATIONS "B" AND SUPPLEMENT TO REGULATIONS "B"

Paragraph 9 of Memorandum to Fiduciary Agents (General Program) No. 57 reads as follows:

After the closing of the war damage account instances may yet arise where return premiums are due insureds and Federal Reserve Banks acting as Custodians will be authorized on your written request, to draw checks for such amounts as you may certify, such checks to be made payable directly to the insured and forwarded to you for appropriate delivery. Items of this nature need not be reported on any Account Summary.

The provisions contained in the foregoing are hereby rescinded due to the time element involved. Should items of this nature occur in the future, please do not disburse your own funds or request payment from our Custodians, the Federal Reserve Banks, but rather refer the matter to the writer at 811 Vermont Avenue, N.W., Washington 25, D. C. [Memorandum to Fiduciary Agents No. 61, August 4, 1948.]



# **WAR DAMAGE CORPORATION**

**WASHINGTON, D. C.**

## **REGULATIONS**

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### **LOSS ADJUSTMENT PROCEDURE**

**W.D.C.—REGULATIONS "C"—EFFECTIVE JULY 1, 1942**

## FOREWORD

The purpose of Regulations "C" is to establish as definitely as practicable the procedure to be followed and the facilities to be used in reporting, adjusting, and paying of claims for loss under the terms and conditions of the War Damage Corporation policy of insurance, WDC Form No. 1. Procedure will vary according to the extent of damage which is the subject of claims. Sporadic losses may be handled by the adjusting facilities immediately available. Catastrophic losses will require the prompt establishment of adequate emergency adjusting facilities. If the procedure herein prescribed, subject to such supplemental instructions as may be issued from time to time, is followed by the Insureds, Producers, and Fiduciary Agents, it will enable War Damage Corporation to deal promptly with all claims.

## DEFINITION OF TERMS

**CORPORATION OR WDC**—The terms "Corporation" and "WDC" each shall mean War Damage Corporation, a corporation created by the Reconstruction Finance Corporation pursuant to Section 5d of the Reconstruction Finance Corporation Act, as amended.

**POLICY**—The term "Policy" shall mean the form of policy designated WDC Form No. 1.

**INSURED**—The term "Insured" shall mean any applicant to whom a Policy has been issued by the Corporation in accordance with Regulations "A", as amended.

**FIDUCIARY AGENT**—The term "Fiduciary Agent" shall mean any insurance carrier (Capital Stock Insurance Company, Mutual Insurance Company or Reciprocal Exchange) which has been specifically appointed by the Corporation to act as its Fiduciary Agent under a Fiduciary Agent Agreement.

**PRODUCER**—The term "Producer" shall mean any authorized insurance agent or broker who is qualified to receive applications for War Damage Corporation insurance under Regulations "A".

**CLAIMS SERVICE OFFICE**—The term "Claims Service Office" shall mean any office established by the Corporation within the United States, and certain of the Territories and Possessions, to service claims under Policies. These offices, their addresses and telephone numbers, are shown in "Appendix D". Temporary Claims Service Offices will be established promptly at the scene of a catastrophe should circumstances require, and the location of such temporary offices will be made known through the press, radio, or other available means.

**ADJUSTER**—The term "Adjuster" shall mean any claims adjuster duly registered with a Claims Service Office.

**NOTICE OF LOSS**—The term "Notice of Loss" shall mean the notification to the Corporation's Fiduciary Agent of a claim under a Policy, including all of the particulars prescribed in the specimen Notice of Loss form shown in "Appendix A".

**PROOF OF LOSS**—The term "Proof of Loss" shall mean a detailed sworn statement in proof of loss properly executed by the Insured, including all of the information prescribed in the specimen Proof of Loss form shown in "Appendix B".

**NON-WAIVER AGREEMENT**—The term "Non-waiver Agreement" shall mean an agreement (substantially in the form of the specimen Non-waiver Agreement shown in "Appendix C") entered into between the Claims Service Office (acting

on behalf of the Corporation) and the Insured so as to facilitate an agreement as to the amount of loss, without either party waiving any of its rights, where questions of liability are encountered which do not lend themselves readily to determination.

**CUSTODIAN BANK**—The term "Custodian Bank" shall mean any Federal Reserve Bank (or branch thereof) located as designated in Regulations "B", which acts as a Custodian for funds of the Corporation.

## **RULES**

### **REPORTING A LOSS BY THE INSURED**

**RULE 1**—The Policy (lines 127-129 inclusive) requires that "In the event of loss, the Insured shall give immediate written notice to the Corporation." Rule 12 of Regulations "A" provides that "In the event of loss, the Insured shall give immediate written notice to the Fiduciary Agent through which the Policy was issued and the Insured shall comply with the provisions of the Policy relating to requirements in case of loss." Hence, notice of loss delivered to the Fiduciary Agent shall constitute an effective notice of loss to the Corporation. Such notice of loss shall be given to the Fiduciary Agent, either by the Producer or by the Insured (or his legal representative). A copy of the Notice of Loss shall be sent by the Producer, or by the Insured (or his legal representative), to the appropriate Claims Service Office. The Notice of Loss shall contain the following information: the name and address of the Fiduciary Agent; the Policy number; the amount of coverage (by items where two or more are covered); the date of the Policy; the name of the Insured; the address of the Insured; the location of the insured property; the description of the insured property (whether building, contents, motor vehicle, etc.); the name of the loss payee (if any); an estimate of the loss or damage (by items where two or more are covered); the date of the loss or damage; the cause of the loss or damage; and any other pertinent information which may be helpful.

### **DUTIES OF CLAIMS SERVICE OFFICE**

**RULE 2**—Upon receipt of the Notice of Loss under a Policy, the Claims Service Office shall promptly refer the claim to an Adjuster who forthwith shall proceed with the adjustment. The assignment of claims to Adjusters shall be made only by the respective Claims Service Office.

The sources upon which the Adjuster may rely for details as to insurance coverage are, in the order of their importance:

- (a) The Insured's Policy.
- (b) The Fiduciary Agent's copy of the Insured's original Application, and any amendments thereto.
- (c) The Producer's copy of the Insured's original Application, and any amendments thereto.
- (d) The tabulating ticket copy of the Insured's original Application, and any amendments thereto, as filed by the Fiduciary Agent with the Custodian Bank.

If questions of liability are encountered by the Adjuster, a Non-waiver Agreement may nevertheless be executed between the Insured and the Claims Service Office (acting on behalf of the Corporation) in order to facilitate an agreement as to the actual cash value of the property involved and amount of loss or damage. Questions of liability and other controversial issues arising between the Insured and the Adjuster during the course of the adjustment shall be submitted by the Adjuster with necessary supporting papers to the appropriate Claims Service Office for disposition. If necessary, the Claims Service Office shall refer such matters with necessary supporting papers to the Corporation for further instructions. Copies of correspondence between the Adjuster, the Claims

Service Office, and the Corporation relative to any claim shall be sent to the Fiduciary Agent which issued the Policy. The completed Proof of Loss, the adjustment expense voucher, and supporting papers shall be sent by the Adjuster to the appropriate Claims Service Office. The Claims Service Office shall check the Proof of Loss and expense voucher and, if found to be in order, shall certify as to correctness. The completed Proof of Loss, accompanied by the Adjuster's expense voucher, shall be forwarded by the Claims Service Office to the respective Fiduciary Agent for disposition as outlined in Rule 3.

#### **DUTIES OF FIDUCIARY AGENT IN CASE OF LOSS**

**RULE 3**—Upon receipt of Notice of Loss, the Fiduciary Agent shall verify the coverage, acknowledge to the Insured (or the Producer) receipt of the claim, and confirm the existence of the coverage to the appropriate Claims Service Office, such confirmation to be supported by any details as to coverage which may be helpful to the Adjuster.

When the completed Proof of Loss, accompanied by the supporting papers, is received by the Fiduciary Agent from the Claims Service Office (as prescribed in Rule 2), the Fiduciary Agent shall:

- (a) Check the Proof of Loss against its records and, if found to be in order, certify the correctness thereof on the face of the Proof of Loss over the duly attested signature of an authorized officer of the Fiduciary Agent. If the Proof of Loss is found not in order, the Fiduciary Agent shall communicate with the Claims Service Office in order to obtain satisfactory completion. If it becomes necessary to refer any question regarding the Proof of Loss to the Corporation for further instructions, a copy of the transmittal letter, and a copy of any related correspondence between the Fiduciary Agent and the Corporation, shall be sent to the appropriate Claims Service Office.
- (b) Send the certified Proof of Loss and all supporting papers to the appropriate Custodian Bank for payment of the claim to the Insured.
- (c) Certify as to the acceptability of the Adjusters' expense vouchers and return to the appropriate Claims Service Office for payment.
- (d) Keep an appropriate record of losses certified for payment and the certified adjustment expenses incident thereto.

#### **PROVISIONS OF THE POLICY RELATING TO LOSS**

The Policy imposes upon the Insured and the Corporation certain conditions directly relating to loss. For convenient reference these are:

##### **REPORTING A LOSS BY THE INSURED**

**REFERENCE 1**—The Policy (lines 127-129 inclusive) provides that "In the event of loss, the Insured shall give immediate written notice to the Corporation."

##### **INSURED SHALL SAVE AND PRESERVE PROPERTY**

**REFERENCE 2**—The Policy (lines 64-66 and 69-71 inclusive) provides that "The Corporation shall not be liable for loss caused directly or indirectly by: \* \* \*

(b) neglect of the Insured to use all reasonable means to save and preserve the property after damage resulting from the perils herein covered."

##### **INSURED SHALL EXHIBIT SALVAGE**

**REFERENCE 3**—The Policy (lines 141 and 143-145 inclusive) provides that "\* \* \* the Insured shall \* \* \*, as often as may be required, exhibit to any person designated by the Corporation all that remains of any property herein covered \* \* \*."

##### **INSURED SHALL FURNISH INVENTORY**

**REFERENCE 4**—The Policy (lines 127-132, inclusive) provides that "In the

event of loss, the Insured shall \* \* \* furnish a complete inventory of the destroyed, damaged and undamaged property, stating the quantity, cost and actual cash value of each article and the amount claimed thereon." (It will facilitate the loss adjustment if the Insured will have prepared and available for the Adjuster the information above required. The Corporation recommends that Insureds have prepared at all times and deposited for safe keeping, away from the premises involved, a detailed inventory of property covered).

#### **WAIVER OF INVENTORY OF UNDAMAGED PROPERTY**

**REFERENCE 5**—The Policy (lines 88-95, inclusive) provides that "If the claim for loss is both less than \$10,000 and less than 2% of the total amount of insurance upon the property described in the application, at the time such loss occurs, no special inventory or appraisal of the undamaged property shall be required, and if the property described in the application consists of two or more items, the provisions of this paragraph shall apply to each item separately."

#### **IF REQUIRED, INSURED SHALL FURNISH SPECIFICATIONS**

**REFERENCE 6**—The Policy (lines 141-143, inclusive) provides that "If required, the Insured shall furnish verified plans and specifications of any buildings, fixtures or machinery destroyed or damaged."

#### **INSURED SHALL PRODUCE RECORDS**

**REFERENCE 7**—The Policy (lines 141 and 147-152, inclusive) provides that "\* \* \* the Insured shall \* \* \* as often as may be required, produce for examination all books of account, bills, invoices and other vouchers, or certified copies thereof, if originals be lost, at such reasonable time and place as may be designated by the Corporation, and permit extracts and copies thereof to be made."

#### **EXAMINATION UNDER OATH**

**REFERENCE 8**—The Policy (lines 141 and 145-147, inclusive) provides that "If required, the Insured shall \* \* \* submit to examinations under oath by any person named by the Corporation and subscribe the same."

#### **CONSEQUENTIAL LOSS EXCLUDED**

**REFERENCE 9**—The Policy (lines 29-34, inclusive) provides that "No allowance shall be made for compensation for loss of use, loss of profits, loss resulting from delay or deterioration, loss or impairment of market, cessation of work, fixation of price or value, interruption of business or manufacture or occupancy, or for consequential loss."

#### **NO ALLOWANCE FOR INCREASED COST OF CONSTRUCTION**

**REFERENCE 10**—The Policy (lines 34-37, inclusive) provides that "No allowance shall be made for any increased cost of repair or reconstruction by reason of any ordinance or law regulating construction, use or repair."

#### **LOSS SHALL NOT EXCEED ACTUAL CASH VALUE**

**REFERENCE 11**—The Policy (lines 23-25, inclusive) provides that "The amount of loss shall not exceed the actual cash value of the property."

#### **LOSS SHALL NOT EXCEED COST TO REPAIR OR REPLACE**

**REFERENCE 12**—The Policy (lines 23-24 and 27-29, inclusive) provides that "The amount of loss shall not exceed \* \* \* the amount it would cost to repair or replace the property with material of like kind and quality within a reasonable time after the loss."

#### **CORPORATION MAY TAKE PROPERTY**

**REFERENCE 13**—The Policy (lines 172-175, inclusive) provides that "It shall be optional with the Corporation to take all or any part of the property at the agreed value."

**CORPORATION MAY REPAIR, REBUILD  
OR REPLACE—NO ABANDONMENT**

REFERENCE 14—The Policy (lines 172-173 and 175-180, inclusive) provides that "It shall be optional with the Corporation \* \* \* to repair, rebuild or replace the property destroyed or damaged with other of like kind and quality within a reasonable time on giving notice of its intention so to do within thirty days after the receipt of the proof of loss; but there can be no abandonment to the Corporation of any property."

**LOSS SHALL NOT EXCEED INTEREST OF INSURED**

REFERENCE 15—The Policy (lines 23-26, inclusive) provides that "The amount of loss shall not exceed \* \* \* the interest of the Insured therein at the time of loss."

**MORTGAGE OR OTHER INTERESTS**

REFERENCE 16—The Policy (lines 106-114, inclusive) provides that "If the application provides that loss hereunder shall be payable in whole or in part to a payee other than the Insured, and the Insured fails to render proof of loss within the time required by this policy, such payee shall, upon notice, as if named as the Insured herein, render proof of loss as herein specified within sixty days thereafter, and shall be subject to the provisions hereof as to examination under oath, appraisal, time of payment, and bringing suit."

**OTHER INSURANCE**

REFERENCE 17—The Policy (lines 99-105, inclusive) provides that "If there is any other insurance covering the property insured hereunder, whether prior to, subsequent to, or simultaneous with this insurance, which in the absence of this insurance would cover the loss or damage hereby covered, then the Corporation shall not be liable hereunder for more than the excess over and above such other insurance."

**RIGHT OF SUBROGATION**

REFERENCE 18—The Policy (lines 195-198, inclusive) provides that "the Corporation may require from the Insured an assignment of all right of recovery against any party for loss to the extent that payment therefor is made by the Corporation."

**INSURED SHALL FILE PROOF OF LOSS WITHIN SIXTY DAYS**

REFERENCE 19—The Policy (lines 127-128 and 133-135, inclusive) provides that "In the event of loss, the Insured shall \* \* \* file with the Corporation a Proof of Loss within 60 days after the loss, unless such time is extended by the Corporation in writing." (It is the function of the Claims Service Office to obtain from the Insured a duly executed and completed Proof of Loss, and it is expected this will be accomplished within the time prescribed in the Policy. If for any reason it becomes necessary for an Insured independently to file a Proof of Loss in order to preserve his rights under the Policy, such Proof of Loss shall be filed with the appropriate Fiduciary Agent, if practicable, otherwise with the duly constituted supervisory insurance official of the State (including the District of Columbia), Territory or Possession wherein the insured property is located, or with the nearest Claims Service Office, or with the Corporation).

**INSURED PREVENTED FROM COMPLYING  
WITH POLICY REQUIREMENTS**

REFERENCE 20—The Policy (lines 206-213, inclusive) provides that "If the Insured is unable to comply with any of the provisions of the policy applicable to a loss because of enemy action, occupation or control, the Insured's right of recovery shall not be prejudiced; provided the Insured shall comply with such provisions within a reasonable time after the Insured becomes able to do so, but in no event later than six months thereafter."

**APPRAISAL**

**REFERENCE 21**—The Policy (lines 153-171, inclusive) provides that "In case the Insured and the Corporation fail to agree as to the actual cash value or the amount of loss, then, on the written demand of either, each shall select a competent and disinterested appraiser and notify the other of the appraiser selected within twenty days after such demand. The appraisers shall first select a competent and disinterested umpire, and, in the event of their failure within fifteen days to agree upon such umpire, then, on request of the Insured or the Corporation, such umpire shall be selected by a Judge of a Federal Court of the district in which the property is located. The appraisers shall then appraise the loss, stating separately actual cash value and loss to each item; and, failing to agree, shall submit their differences, only, to the umpire. An award in writing, so itemized, of any two when filed with the Corporation shall determine the amount of actual cash value and loss. Each appraiser shall be paid by the party selecting him and the expenses of appraisal and the umpire shall be paid by the parties equally."

**NO SUIT OR ACTION SUSTAINABLE**

**REFERENCE 22**—The Policy (lines 190-194, inclusive) provides that "No suit or action for recovery of any claim, shall be sustainable in any court of law or equity, unless all the requirements of the policy shall have been complied with, or unless commenced within twelve months after the date of loss."

**PAYMENT OF LOSS WITHIN SIXTY DAYS**

**REFERENCE 23**—The Policy (lines 181-189, inclusive) provides that "Any loss shall be payable sixty days after proof of loss, as herein provided, is received by the Corporation and ascertainment of the loss is made either by agreement between the Insured, mortgagee or loss payee, if any, and the Corporation, expressed in writing, or by the filing with the Corporation of an award as herein provided, and if the loss shall be payable to a payee other than the Insured, the amount of any loss shall be payable to such payee as interest may appear."

**CONCEALMENT OR FRAUD**

**REFERENCE 24**—The Policy (lines 38-45, inclusive) provides that "This policy shall be void if, whether before or after a loss, the Insured has wilfully concealed or misrepresented any material fact or circumstance concerning this insurance or the subject thereof, or the interest of the Insured therein, or in case of any fraud or false swearing by the Insured relating thereto."

WDC Form No. 1  
July 1943

No. \_\_\_\_\_

# War Damage Corporation

(A corporation created by Reconstruction Finance Corporation pursuant to Section 14 of the Reconstruction Finance Corporation Act, as amended, herein called the "Corporation")

WASHINGTON, D. C.

1 ISSUED TO: \_\_\_\_\_  
(herein called the "Insured")

2 Mail address: \_\_\_\_\_

3 Effective date: \_\_\_\_\_

4 **In Consideration** of the payment of the premium, the Corporation agrees to indemnify the Insured, and  
 5 legal representatives, against direct physical loss of or damage to the property described in the attached application  
 6 which may result from **ENEMY ATTACK INCLUDING ANY ACTION TAKEN BY THE MILITARY, NAVAL**  
 7 **OR AIR FORCES OF THE UNITED STATES IN RESISTING ENEMY ATTACK.**

8 This insurance shall take effect on the effective date herein stated, at noon, standard time, at the place  
 9 where the property is located, and shall terminate twelve months thereafter, at the same hour.

10 The representations, terms and conditions of the application attached hereto shall be a part of this policy, and,  
 11 except as otherwise herein provided, this policy shall cover the property described in the application, for the amounts  
 12 therein stated, while located at the place(s) stated in the application, but not elsewhere.

13 Assignment of this policy shall not be valid except with the written consent of the Corporation.

14 The provisions printed on the following pages are made a part of this policy, and this policy shall also be  
 15 subject to such other provisions, stipulations and agreements as may be added hereto, over the signature of a duly  
 16 authorized Fiduciary Agent.

17 **In Witness Whereof,** the Corporation has executed this policy, but this policy shall not be valid unless  
 18 countersigned by a duly authorized Fiduciary Agent of the Corporation.

19

WAR DAMAGE CORPORATION

Attest:

*A. H. Logan*  
 Secretary

*M. Clayton*  
 President

20 Countersigned this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_

21 \_\_\_\_\_  
(Authorized Fiduciary Agent)

22 By \_\_\_\_\_

**23 AMOUNT OF****24 LOSS**

25 The amount of loss shall not  
26 exceed the actual cash value of  
27 the property, nor the interest  
28 of the Insured therein at the time of loss, nor the  
29 amount it would cost to repair or replace the property  
30 with material of like kind and quality within a reason-  
31 able time after the loss. No allowance shall be  
32 made for compensation for loss of use, loss of  
33 profits, loss resulting from delay or deterioration,  
34 loss or impairment of market, cessation of work, han-  
35 dling of price or value, interruption of business or manufac-  
36 ture or occupancy, or for consequential loss. No allowance  
37 shall be made for any increased cost of repair or recon-  
38 struction by reason of any ordinance or law regulating  
39 construction, use or repair.

**40 ON CONCERNMENT****41 OR FRAUD**

42 This policy shall be void if,  
43 whether before or after a loss,  
44 the Insured has wilfully con-  
45 cealed or misrepresented any material fact or circum-  
46 stance concerning this insurance or the subject thereof,  
47 or the interest of the Insured therein, or in case  
48 of any fraud or false swearing by the Insured relating  
49 thereto.

**50 PROPERTY****51 EXCLUDED**

52 Unless specifically provided in  
53 writing hereon, this policy shall  
54 not cover accounts, bills, cur-  
55 rency, deeds, evidences of debt, securities, money, bullion,  
56 stamps, furs, jewelry, precious and semi-precious stones,  
57 works of art, statuary, paintings, pictures, etchings,  
58 antiques, stamp and coin collections, manuscripts, books  
59 and printed publications more than 30 years old, models,  
60 curiosities, objects of historical or scientific interest, pla-  
61 ces, water craft, pleasure aircraft, standing timber, growing  
62 crops, orchards, or any real property which is not a part  
63 of a structure or building.

**64 PREMIUM**

65 The premium required by the  
66 regulations of the Corporation  
67 shall be paid in full prior to the effective date. If a check is  
68 tendered in payment of premium and such check is not hon-  
69 ored upon presentation for the full amount thereof, this  
70 policy shall be void.

**71 PERILS NOT****72 COVERED**

73 The Corporation shall not be  
74 liable for loss caused directly  
75 or indirectly by:  
76 (a) blackmail; burglary; robbery; theft; larceny; pillage or  
77 looting; sabotage; vandalism; malicious mischief; or  
78 (b) neglect of the Insured to use all reasonable means  
79 to save and preserve the property after damage resulting  
80 from the perils herein covered.

**81 PRO RATA****82 DISTRIBUTION**

83 If any item of insurance covers  
84 blanket in or on more than one  
85 building, structure or place, the  
86 amount of insurance under such item shall attach in or on  
87 each building, structure or place in that proportion which  
88 the value of the property in or on each said building, struc-  
89 ture or place shall bear to the value of all of the property  
90 covered by such blanket item.

91 This pro rata distribution clause shall not apply if this  
92 policy is subject to 90% or 100% coinsurance.

**93 COINSURANCE**

94 The Corporation shall not be  
95 liable for a greater proportion  
96 of any loss than the amount of insurance under this policy  
97 bears to the stipulated percentage of the actual cash value  
98 of the property described in the application at the time when  
99 such loss occurs. The stipulated percentage shall be

**100 APPRAISAL**

101 In case the Insured and the  
102 Corporation fail to agree as to  
103 the actual cash value or the amount of loss, then, on  
104 the written demand of either, each shall select a competent  
105 and disinterested appraiser and notify the other of the ap-  
106 praiser selected within twenty days after such demand. The  
107 appraisers shall first select a competent and disinterested  
108 umpire, and, in the event of their failure within fifteen days  
109 to agree upon such umpire, then, on request of the Insured  
110 or the Corporation, such umpire shall be selected by a Judge  
111 of a Federal Court of the district in which the property is  
112 located. The appraisers shall then appraise the loss, stating  
113 separately actual cash value and loss to each item; and,  
114 failing to agree, shall submit their differences, only, to the  
115 umpire. An award in writing, so itemized, of any two when  
116 filed with the Corporation shall determine the amount of  
117 actual cash value and loss. Each appraiser shall be paid by  
118 the party selecting him and the expenses of appraisal and  
119 the umpire shall be paid by the parties equally.

**120 CORPORATION'S****121 OPTIONS**

122 It shall be optional with the  
123 Corporation to take all or any  
124 part of the property at the  
125 agreed value, and also to repair, rebuild, or replace the  
126 property destroyed or damaged with other of like kind and  
127 quality within a reasonable time on giving notice of it. It  
128 shall be the duty of the Insured to give notice of it. It  
129 shall be the duty of the Insured to give notice of it. It  
130 shall be the duty of the Insured to give notice of it. It  
131 shall be the duty of the Insured to give notice of it. It  
132 shall be the duty of the Insured to give notice of it. It  
133 shall be the duty of the Insured to give notice of it. It

**134 PAYMENT OF LOSS**

135 Any loss shall be paid within  
136 sixty days after proof of loss  
137 herein provided, is received by the Corporation and ascer-

138 tained of the loss is made either by agreement between the  
139 Insured, mortgagee or loss payee, if any, and the Corpora-  
140 tion, expressed in writing, or by the filing with the Corpora-  
141 tion of an award as herein provided, and if the loss shall be  
142 payable to a payee other than the Insured, the amount of any  
143 loss shall be payable to such payee as interest may appear.

144 No suit or action for recovery  
145 of any claim, shall be sustain-  
146 able in any court of law or equity unless all the require-  
147 ments of this policy shall have been complied with, or un-  
148 less commenced within ~~thirty~~ <sup>sixty</sup> days after the date of loss.

**149 SUBROGATION**

150 The Corporation may require  
151 from the Insured an assignment  
152 of all right of recovery against any party for loss to the  
153 extent that payment therefor is made by the Corporation.

**154 WAIVER**

155 No permission affecting this in-  
156 surance shall exist, or waiver  
157 of any provision be valid, unless granted herein or expressed  
158 in writing hereon. No provision, stipulation or for-  
159 feiture shall be held to be waived by any requirement or  
160 proceeding on the part of the Corporation relating to ap-  
161 praisal or to any examination provided for herein.

**162 EXTENSION**

163 If the Insured is unable to com-  
164 ply with any of the provisions  
165 of this policy applicable to a  
166 loss because of enemy action, occupation or control, the  
167 Insured's right of recovery shall not be prejudiced, provided  
168 the Insured shall comply with such provisions within a  
169 reasonable time after the Insured becomes able to do so,  
170 but in no event later than six months thereafter.

**171 CANCELLATION**

172 This policy may be cancelled  
173 upon the request of the Insured  
174 by the Corporation under this policy, only in case of change in own-  
175 ership of the property, or in the Insured's interest therein.  
176 In this policy be issued in violation of the regulations  
177 of the Corporation in effect at the time of issuance,  
178 this policy may be cancelled by the Corporation by  
179 delivering or mailing five days' written notice to the Insured,  
180 and to the loss payee, if any, at the address given in the  
181 application. In the event of cancellation, the net premium  
182 shall be prorated and returned in conformity with the regu-  
183 lations of the Corporation.

**184 REQUIREMENTS IN**

185 In the event of loss, the Insured  
186 shall give immediate written  
187 notice to the Corporation, fur-  
188 nish a complete inventory of the destroyed, damaged and  
189 undamaged property, stating the quantity, cost and actual  
190 cash value of each article and the amount claimed thereon,  
191 and file with the Corporation a proof of loss within 60 days  
192 after the loss, unless such time is extended by the Corpora-  
193 tion in writing. Such proof of loss, signed and sworn to  
194 by the Insured, shall state the Insured's knowledge and be-  
195 lief as to the time and origin of the loss, the interest  
196 of the Insured and all others in the property, the actual  
197 cash value of each item thereof and the amount of loss  
198 thereto, and all contracts of insurance covering any of such  
199 property. If required, the Insured shall furnish verified  
200 plans and specifications of any buildings, fixtures or machin-  
201 ery destroyed or damaged; as often as may be required, ex-  
202 hibit to any person designated by the Corporation all that  
203 remains of any property herein covered; submit to examina-  
204 tions under oath by any person named by the Corporation  
205 and subscribe the same; and, as often as may be required,  
206 reduce for examination all books of account, bills, invoices  
207 and other vouchers, or certified copies thereof, if originals  
208 be lost, at such reasonable time and place as may be des-  
209 ignated by the Corporation, and permit extracts and copies  
210 thereof to be made.

to

**WAR DAMAGE CORPORATION**

Date \_\_\_\_\_ 19\_\_\_\_ By \_\_\_\_\_

**INSTRUCTIONS TO INSURED AND PRODUCERS**

**Do not telegraph—always use a Notice of Loss form including all of the information prescribed on the reverse side. Please fill out a separate Notice of Loss for each policy involved and state probable amount of loss under each Policy.**

**Do not change a Policy or any entry relating to coverage after a loss; all such matters should remain precisely as the loss finds them.**

**In case of damage to merchandise, household furniture, or other personal property, Insured is required to have both the sound and damaged articles at once protected, put in order, and inventoried; and, if possible, see that books and papers are carefully preserved.**

**There can be no abandonment to the Corporation of any property under any circumstances.**

**"APPENDIX B"**

Fiduciary Agent's Claim No.

**SWORN STATEMENT****in****PROOF OF LOSS**

Amount of Policy

To the

Policy Number

\$ \_\_\_\_\_  
 Issued Expires  
 19. 19.

**WAR DAMAGE CORPORATION**  
 of Washington, D. C.

\_\_\_\_\_  
 Producer at

By the above indicated policy of insurance you insured \_\_\_\_\_ against loss which may result from enemy attack, including any action taken by the Military, Naval or Air Forces of the United States in resisting enemy attack to the property described under Schedule "A," according to the terms and conditions of the said policy and all forms, endorsements, transfers and assignments attached thereto.

1. **TIME AND ORIGIN:** A loss occurred about the hour of \_\_\_\_\_ o'clock \_\_\_\_\_ M., on the \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_\_. The cause and origin of the said loss were: \_\_\_\_\_
2. **OCCUPANCY:** The building described, or containing the property described, was occupied at the time of the loss as follows, and for no other purpose whatever: \_\_\_\_\_
3. **TITLE AND INTEREST:** When this policy was acquired and at the time of the loss the interest of your insured in the property described therein was sole and unconditional ownership, and no other person or persons had any interest therein or incumbrance thereon. (State exceptions, if any.) \_\_\_\_\_
4. **CHANGES:** Since the said policy was acquired there has been no assignment thereof, or change of ownership, use, occupancy, possession, location or exposure of the property described, or of your insured's interest therein. (State exceptions, if any.) \_\_\_\_\_
5. **TOTAL INSURANCE:** The total amount of insurance upon the property described by this policy was, at the time of the loss, \$ \_\_\_\_\_, as more particularly specified in the apportionment attached under Schedule "C," besides which there was no policy or other contract of insurance, written or oral, valid or invalid.
6. **THE CASH VALUE** of said property at the time of the loss was. . . . . \$ \_\_\_\_\_
7. **THE WHOLE LOSS AND DAMAGE** as stated under Schedule "B" was. . . . . \$ \_\_\_\_\_
8. **THE AMOUNT CLAIMED** under the above numbered policy is. . . . . \$ \_\_\_\_\_

The said loss did not originate by any act, design or procurement on the part of your insured, or this affiant; nothing has been done by or with the privity or consent of your insured or this affiant, to violate the conditions of the policy, or render it void; no articles are mentioned herein or in annexed schedules but such as were in the building damaged or destroyed, and belonging to, and in possession of the said insured at the time of said loss; no property saved has in any manner been concealed, and no attempt to deceive the said company, as to the extent of said loss, has in any manner been made. Any other information that may be required will be furnished and considered a part of this proof.

The furnishing of this blank or the preparation of proofs by a representative of the above insurance company is not a waiver of any of its rights.

State of \_\_\_\_\_  
 County of \_\_\_\_\_ Insured  
 Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 19\_\_\_\_.

\_\_\_\_\_  
Notary Public

NOTE: This Proof of Loss form is a specimen and is not available for distribution. Any similar form is acceptable, provided it includes the essential information required above.

**WDC Policy Form No. 1 with WDC Application Form No. .... attached**

**Item 1. §**\_\_\_\_\_ **on** \_\_\_\_\_

**Item 2.** § \_\_\_\_\_ on \_\_\_\_\_

**Item 3. \$\_\_\_\_\_ on \_\_\_\_\_**

**Situate**\_\_\_\_\_

**Coinurance, Average, or Distribution Clause, if any**.....

Loss, if any, payable to.....

	Cash Value	Loss and Damage
Totals:		

[illegible]

By \_\_\_\_\_, Adjuster

**"APPENDIX C"****NON-WAIVER AGREEMENT**

Insured.....  
 Location.....  
 Property Involved in Claim.....  
 Date of Loss.....

IT IS HEREBY AGREED by and between the above-named insured and the insurance companies whose names are signed hereto that anything done or to be done by said insurance companies, or on their behalf, in connection with the above-described loss, including any investigation into cause or amount of loss or damage or other matter relative thereto, shall not waive, invalidate, forfeit or modify any of their rights under the terms and conditions of the respective policies issued by them.

THIS AGREEMENT is made for the aid and convenience of the parties hereto, to permit investigation of the claim and ascertainment of appropriate values of and loss or damage to the property involved to be made without delay and without prejudice to any of their rights.

WITNESSES:

.....  
 .....  
 ADDRESS.....  
 .....  
 ADDRESS.....

Dated..... 19.....

**DETERMINATION OF CASH VALUE AND LOSS OR DAMAGE**  
 (Subject to non-waiver agreement, if any, and to terms and conditions of applicable insurance policies and agreements)

On.....  
 On.....  
 On.....  
 On.....  
 On.....

TOTAL

Cash Value	Loss or Damage
\$.....	\$.....
\$.....	\$.....
\$.....	\$.....
\$.....	\$.....
\$.....	\$.....
\$.....	\$.....
\$.....	\$.....

WITNESSES:

.....  
 .....  
 ADDRESS.....  
 .....  
 ADDRESS.....

Dated..... 19.....

NOTE: The above Non-waiver Agreement form is a specimen and is not available for distribution. Any similar form is acceptable, provided it includes the essential information required above.

**WAR DAMAGE CORPORATION CLAIMS SERVICE OFFICES**

CENTRAL OFFICE 14 JOHN STREET, NEW YORK, N. Y. - TELEPHONE, CORTLANDT 7-4894

[illegible]

**CLAIMS SERVICE OFFICES—Continued**

[illegible]

# WAR DAMAGE CORPORATION CLAIMS SERVICE OFFICES—Continued

CENTRAL OFFICE, 116 JOHN STREET, NEW YORK, N. Y.—TELEPHONE, CORTLANDT 7-4674

City and State	Office Location	Telephone Number	City and State	Office Location	Telephone Number	City and State	Office Location	Telephone Number
<b>TENNESSEE—Continued</b>			<b>TEXAS—Continued</b>			<b>WASHINGTON—Continued</b>		
Knoxville	Hamilton Bank Building	3-0441	Tyler	Citizens Bank Building	4726	Tacoma	Washington Building	Brooklyn 2228
Memphis	Serrich Building	5-2781	Victoria	Widley Building	2056	Yakima	Larson Building	6199
Nashville	Nashville Trust Building	5-2708	Waco	Professional Building	4456	<b>WEST VIRGINIA</b>		
<b>TEXAS</b>			Webster Falls	Waggoner Building	4107	Bethley	Raleigh County Bank Building	9941
Abilene	Moss Building	6251	<b>UTAH</b>			Blairfield	Bradman Building	1996
Amarillo	Oliver-Eagle Building	2-2214	Ogden	Eckels Building	7749	Charleston	People's Exchange Building	Capital 30-161
Austin	Norman Building	8-6408	Salt Lake City	Walker Bank Building	3-3928	Clarkburg	Union Bank Building	6057
Bastrop	Goodhue Building	4093	<b>VERMONT</b>			Huntington	West Virginia Building	28366
Big Spring	506 Hillside Drive	528	Burlington	125 Church Street	3080	Wheeling	Riley Law Building	1856
Bryan	First State Bank Building	2-8765	<b>VIRGIN ISLANDS</b>			<b>WISCONSIN</b>		
Brownwood	Citizens National Bank Building	4395	San Juan, P. R.	Belaval Building	213	Appleton	341 W. College Avenue	7900
Corpus Christi	Jones Building	7137	<b>VIRGINIA</b>			East Chace	Market Square Building	21653
Dallas	Liberty Bank Building	Riverside 9901	Bristol	112 Piedmont Avenue	1047	East de Lac	Nat'l Exch. Bldg.	5006
El Paso	Bailey Tower Building	Main 1172	Danville	Mosier Building	2647	Green Bay	Columbus Building	Adams 241
Fort Worth	Petroleum Building	2-1295	Harrisonburg	The National Bank Building	784	La Crosse	Funkhouser Building	2270
Galveston	Commerce Building	4831	Lynchburg	Allied Arts Building	4249	Madison	Insurance Building	Madison 970
Harrison	Rio Grande Building	861	Newport News	Upton Building	6-1626	Minneapolis	611 North Broadway	Italy 0672
Houston	Express Building	Charter 4-5633	Norfolk	Seaboard-Commerce Building	6-6311	Racine	423 Main Street	Prairie 2644
Lubbock	1112½ Avenue "J"	7461	Richmond	American Building	3-1521	Rhinelander	Merchants State Bank Bldg.	1122
Midland	Thomas Building	1658	Rosemead	Builey Building	5599	Wausau	First Amer. State Bldg.	7474
Palo Alto	First National Bank Building	1730	<b>WASHINGTON</b>			<b>WYOMING</b>		
Pasadena	619 South Cherry Street	799	Seattle	Culman Building	Main 4244	Casper	101 West First Street	43
Port Arthur	PO Box 998	2-4231	Spokane	Mohawk Building	Main 3136	Cheyenne	Boyd Building	4911
San Angelo	2213 Houston Street	4671				Rock Springs	Rock Springs National Bank Building	32
San Antonio	Colby Building	CA-6351				Thermopolis	Mountain States Power Building	271
Texasarkana	Texasarkana National Bank Building	1346						

The Reconstruction Finance Corporation Act, as amended, provides:

SEC. 16. (a) Whoever makes any statement knowing it to be false, or whoever willfully overvalues any security, for the purpose of obtaining for himself or for any applicant any loan, or extension thereof by renewal, deferment of action, or otherwise, or the acceptance, release, or substitution of security therefor, or for the purpose of influencing in any way the action of the corporation, or for the purpose of obtaining money, property, or anything of value, under this Act, shall be punished by a fine of not more than \$5,000 or by imprisonment for not more than two years, or both.

## ADJUSTMENT AGREEMENT

THIS AGREEMENT made and entered into as of the 8th day of October, 1942, by and between WAR DAMAGE CORPORATION (hereinafter referred to as the "Corporation"), a corporation created by Reconstruction Finance Corporation pursuant to Section 5d of the Reconstruction Finance Corporation Act, as amended, and having its principal office in Washington, D. C.; FIRE COMPANIES' ADJUSTMENT BUREAU, INC., (hereinafter referred to as the "Fire Bureau"), a corporation organized and existing under and by virtue of the laws of the State of New York and having its principal office at 116 John Street, New York, New York; WESTERN ADJUSTMENT AND INSPECTION COMPANY (hereinafter referred to as the "Western Bureau"), a corporation organized and existing under and by virtue of the laws of the State of Illinois and having its principal office at 175 West Jackson Boulevard, Chicago, Illinois, and UNDERWRITERS ADJUSTING COMPANY (hereinafter referred to as the "Underwriters Bureau"), a corporation organized and existing under and by virtue of the laws of the State of Illinois and having its principal office at 175 West Jackson Boulevard, Chicago, Illinois.

## WITNESSETH:

Whereas, pursuant to Section 5g of the Reconstruction Finance Corporation Act, as amended, and in accordance with the Corporation's Regulations "A", the Corporation has issued and is presently issuing policies of war damage insurance under which may arise claims for loss requiring investigation, appraisal, adjustment and settlement in connection with which the Corporation will need competent adjusting facilities; and

Whereas, the Fire Bureau, the Western Bureau, and the Underwriters Bureau (said three parties being hereinafter sometimes referred to collectively as the "Bureaus") are presently engaged in the appraisal of insurance losses and the adjustment of insurance claims through their respective organizations, facilities and personnel covering and operating in all of the States of the United States of America; and

Whereas, the Bureaus are willing to make their respective organizations, facilities and personnel available to the Corporation upon the terms and conditions herein set forth as a means of cooperating with the Government in the war effort;

Now, therefore, in consideration of the promises and of the mutual covenants and agreements and upon the terms and conditions hereinafter set forth, the parties hereto agree as follows:

1. The Corporation hereby appoints the Fire Bureau as its Claims Service Manager to manage and supervise the Claims Service Offices of the Corporation which are specifically described and listed in the Corporation's Regulation "C", entitled "Loss Adjustment Procedure", said Regulations "C" being hereby incorporated herein by express reference and made a part hereof to the same extent as if fully set forth herein.

2. The Fire Bureau hereby accepts such appointment and agrees that its principal office located at 116 John Street, New York, New York, shall be the Central Claims Service Office of the Corporation as provided in said Regulation "C" and that such of its presently established and operating offices as are listed in said Regulation "C" shall be Claims Service Offices of the Corporation, as therein described, to be operated for the purposes and in the respects hereinafter specified.

3. The Western Bureau hereby agrees that such of its presently established and operating offices as are listed in said Regulation "C" shall be Claims Service Offices of the Corporation, as therein described, to be operated for the purposes and in the respects hereinafter specified under the management and supervision of said Central Claims Service Office.

4. The Underwriters Bureau hereby agrees that such of its presently established and operating offices as are listed in said Regulations "C" shall be Claims Service Offices of the Corporation, as therein described, to be operated for the purposes and in the respects hereinafter specified under the management and supervision of said Central Claims Service Office.

5. Each of the Bureaus agrees that its said respective offices operating as Claims Service Offices shall render and perform the duties set forth in Rule 2 of the said Regulations "C".

6. Each of the Bureaus agree that it will cause to be established and operated as Claims Service Offices of the Corporation such additional offices as the Claims Service Manager, with the approval of the Corporation, may deem necessary or desirable.

7. The Claims Service Manager may engage the services of independent adjusters (i. e., persons acting and operating as adjusters for their own account

and not in the employ of any of the Bureaus) for specific assignments in order to supplement the facilities of Claims Service Offices whenever the Claims Service Manager deems such action to be necessary.

8. Each of the Bureaus may engage the services of experts such as architects, engineers, builders, public accountants or others to the extent that such specialized services are required from time to time in the performance of its obligations hereunder.

9. The Corporation hereby agrees to reimburse each of the Bureaus for the following direct expenses incurred by it in connection with the conduct of its operations hereunder:

(a) The direct compensation paid to employees (including supervisory or administrative employees) necessarily engaged in conducting operations hereunder;

(b) The direct compensation (including expenses) paid to independent adjusters engaged for specific assignments in accordance with paragraph 7 hereof;

(c) The direct compensation (including expenses) paid to experts engaged in accordance with paragraph 8 hereof;

(d) All expenses incurred directly in connection with the establishment, maintenance and operation of any additional Claims Service Offices established in accordance with the provisions of paragraph 6 hereof;

(e) That portion of the respective salaries of adjusters in the regular employ of each of the Bureaus, which is proportionate to the working time during which they are directly engaged in the operations required to be conducted hereunder; it being understood, however, that the Corporation shall reach a mutually satisfactory agreement with each of the Bureaus, respectively, as to the basis for determination of the charges to be made for such adjusters and that such basis, when so mutually agreed to, shall constitute the basis for reimbursement under this subparagraph (e); and

(f) All direct out-of-pocket expenses (including expenses for travel and sustenance) provided such expenses are necessarily incurred in connection with the operations hereunder, and provided such expenses do not exceed the ordinary allowances authorized by the respective Bureaus for their own employees in the normal conduct of their own business;

it being understood that each of the Bureaus shall conduct its operations hereunder without profit and without any reimbursement for executive management, overhead, or expenses normally incident to its regular business.

10. Each of the Bureaus shall submit to the Corporation (through the Claims Service Manager, as hereinafter provided) from time to time, in the form and manner prescribed by the Corporation and accompanied by such reasonable supporting data as the Corporation may require, statements of all direct expenses reimbursable pursuant to the provisions of paragraph 9 hereof. All such statements shall be reviewed by the Claims Service Manager and, if found to be in order for payment, shall be approved in writing by the Claims Service Manager and submitted to the Corporation for payment. Payment of each such statement so approved and transmitted by the Claims Service Manager shall be made by the Corporation as promptly as possible in the ordinary course of the Corporation's business, each such payment to be subject to audit by the Corporation as provided in paragraph 11 hereof.

11. The determination of the direct expenses reimbursable under paragraph 9 hereof shall be in accordance with the respective established accounting methods of each of the Bureaus. Such accounting methods shall be subject to approval by the Corporation, but no material change shall be made therein if they conform to good accounting practice and if the direct expenses reimbursable under paragraph 9 hereof are readily ascertainable therefrom. All accounting books and other records pertaining to the operations conducted hereunder or necessary to the ascertainment of any expense reimbursable under paragraph 9 hereof shall be subject to inspection and audit during business hours by any authorized representative of the Corporation, but all information obtained therefrom shall be held in confidence. Within one year after the date of payment of any statement submitted in accordance with paragraph 10 hereof, the Corporation shall examine such books and records and within such one year will advise the Bureau submitting such statement of any disagreement which the Corporation finds with any of the items of expense included in such statement, or thereafter the Corporation shall not disagree with any of such items of expense.

12. All files and papers pertaining to or bearing upon losses adjusted by each of the Bureaus, respectively, and not delivered to the Corporation's Fiduciary Agents accompanying the related proof of loss or otherwise, shall be and remain the property of the Corporation and shall be retained by each of the Bureaus, respectively, for the period of three (3) years after the termination of this agreement, unless sooner delivered to the Corporation as hereinafter provided. Each of the Bureaus may, however, at any earlier date, give notice to the Corporation of files and records considered of no importance and, at the expiration of a period of six (6) months from the date of such notice, it may destroy such files and records unless the Corporation shall elect to receive the same into its own custody and possession.

13. Each of the Bureaus agrees that in the discharge of its duties and obligations hereunder it will exercise at all times its best judgment, care and diligence and, especially in the matter of assignments of claims to adjusters not in its own regular employ, it will act in a manner consistent with the highest degree of good faith, making all such assignments with a view to procuring prompt and efficient adjustments of losses, without reference to and independently of the respective Fiduciary Agents through which the related policies were issued. In the event that any claim is asserted by others against the Bureaus, or any of them, for anything done or left undone by such Bureaus or any of them, or any of their agents or employees, while acting solely for the Corporation under this agreement or in the adjustment of losses and claims hereunder, and while acting in conformity with the provisions of this agreement, without negligence or willful misconduct, in accordance with the standard of performance required hereunder, the Corporation shall, upon receipt of due notice of such claim, defend any suit or proceeding against such Bureau and shall indemnify and save harmless such Bureau with respect to such claim.

14. This agreement shall take effect as of the date first above written and shall continue in force until terminated by any party by giving at least thirty (30) days' written notice by registered mail to the other parties stating the effective date and time at which this agreement shall terminate.

IN WITNESS WHEREOF, the parties hereto have caused this instrument or counterparts thereof to be executed by their respective duly authorized officers or representatives, and their respective seals to be hereunto affixed, duly attested by their respective officers or representatives, and to be delivered as of the day and year first above written.

WAR DAMAGE CORPORATION,  
By W. L. CLAYTON, *President*.

Attest:

\_\_\_\_\_, *Secretary*.  
FIRE COMPANIES' ADJUSTMENT BUREAU, INC.,  
By B. M. CULVER, *President*.

Attest:

\_\_\_\_\_, *Secretary*.  
WESTERN ADJUSTMENT AND INSPECTION COMPANY.  
By J. A. HARDING, *President*.

Attest:

\_\_\_\_\_, *Secretary*.  
UNDERWRITERS ADJUSTING COMPANY,  
By H. H. MOORE, *General Manager*.

Attest:

H. L. PITTINGTON, *Secretary*.

## REGULATIONS "D"

### FOREWORD

**War Damage Corporation.**—War Damage Corporation is a corporation created by Reconstruction Finance Corporation pursuant to Section 5d of the Reconstruction Finance Corporation Act, as amended, herein called the "Corporation" or "WDC." Pursuant to Section 5g of the Reconstruction Finance Corporation Act, as amended, the Corporation is authorized to provide reasonable protection against loss of or damage to property, real and personal, which may result from enemy attack (including any action taken by the military, naval, or air forces of the United States in resisting enemy attack). The Corporation is prepared to

offer such protection in accordance with the Regulations set forth herein, as may be amended from time to time by the Corporation. These Regulations contain appropriate instructions to Producers and Fiduciary Agents regarding the issuance by the Corporation of policies of insurance covering Money and Securities. Inquiries of Producers concerning these Regulations or any other matters relating to the Corporation's Money and Securities program should be directed to a Fiduciary Agent.

**Territory.**—For the present, insurance will be written on Money and Securities only while within the Continental United States of America, Alaska, Virgin Islands, Hawaii, Puerto Rico and the Canal Zone, respectively.

#### EXPLANATION OF TERMS USED HEREIN

**Applicant.**—The term "Applicant" shall mean any person, public or private, including any individual, partnership, corporation, association, State, County, municipality, or other political subdivision, owning or holding Money or Securities and making application to the Corporation for insurance coverage in accordance with these Regulations and on the form of Application prescribed in these Regulations. Two or more related interests may be named as Applicant.

**Policy.**—The term "Policy" shall mean the form of policy designated WDC Form No. 1 (a).

**Insured.**—The term "Insured" shall mean any Applicant to whom a Policy of insurance is issued by the Corporation in accordance with these Regulations.

**Producer.**—The term "Producer" shall mean (a) any authorized insurance broker or (b) any agent of a casualty or surety insurance carrier which has been appointed by the Corporation as its Fiduciary Agent, provided that such insurance broker or such agent is duly licensed in accordance with the legal requirements of the State, Territory or District in which he acts as a Producer.

A direct writing Mutual Company or Reciprocal Exchange appointed by the Corporation as its Fiduciary Agent may also act as a Producer and may also designate another direct writing Mutual Company or Reciprocal Exchange as a Producer, provided any such Producer so designated shall be licensed as an insurer in the jurisdiction where it acts as a Producer.

**Fiduciary Agent.**—The term "Fiduciary Agent" shall mean any casualty or surety insurance carrier (Capital Stock Insurance Company, Mutual Insurance Company or Reciprocal Exchange) which has been specifically appointed by the Corporation to act as its Fiduciary Agent under a "Fiduciary Agent Agreement." Each Fiduciary Agent so appointed is empowered to receive Applications and remittances covering premiums, to issue Policies, and otherwise to transact the business of the Corporation in accordance with these Regulations.

#### RULES

##### *Issuance of Policies—Rule 1*

Policies may be issued only through a Fiduciary Agent and only one Policy shall be issued to an Insured. Two or more related interests may be named as the Insured.

##### *Types of Coverage—Rule 2*

The following Money and Securities Coverages are available under the Application (see specimen form of Application, WDC Form No. 16, appended to these Regulations):

Coverage A: While within any "Preferred Vault" at any location specified in the Application.

Coverage B: While within any "Safe" or "Vault" (including any "Preferred Vault") at any location specified in the Application.

Coverage C: While within any of the "Premises" (including any "Safe," "Vault" or "Preferred Vault" located therein) specified in the Application, or within any of the "Custodians" (including any bank Vaults or safe deposit company Vaults used by any of the Custodians for safe-keeping) specified in the Application.

Coverage D: While in transit or otherwise within the geographical limits in which the Corporation insures, for any business purpose, outside any and all "Premises" and "Safe Deposit Boxes," irrespective of the locations specified in the Application, and outside Custodians specified in the Application, and outside bank Vaults and safe deposit company Vaults used by Custodians and specified in the Application; excluding, however, loss in the mail or in the custody of a carrier for hire other than an armored motor vehicle company.

**Application for Coverage—Rule 3**

The Applicant shall apply for insurance through any Producer, on the appropriate Application form (see specimen form of Application, WDC Form No. 16, appended to these Regulations) prescribed by the Corporation. Four copies of the Application shall be signed by the Applicant. The Application will be supplied in sets, consisting of four numbered copies of the Application (numbered 1, 2, 3 and 4). The Producer shall complete the Application in one operation and retain the No. 4 copy of the Application. No. 1, No. 2 and No. 3 copies of the Application shall be mailed to the Fiduciary Agent.

*Applications transmitted by the Producer to the Fiduciary Agent shall be accompanied by cash, money order, or check in full payment of the required premium. Money orders and checks shall be drawn to the order of the Fiduciary Agent to which the Application is transmitted. The Application, No. 1 copy of which shall be attached to and form a part of the Policy, will contain the only description of the Money and Securities insured, and the Producer shall make certain that the Application contains all descriptive information required thereby.*

**Effective Date and Term of Insurance—Rule 4**

*The Producer's acceptance of the Application does not constitute a binder.—*The insurance applied for shall take effect on the "Effective Date," at noon Standard time, at the mail address of the Applicant, and shall terminate 12 months thereafter at the same hour. (For cancellation provisions, see Rule 6.) If the Application has been properly completed and is accompanied by full payment of premium, the "Effective Date" shall be the date on which the Application is received and date-stamped by the Fiduciary Agent (but in no event earlier than December 21, 1942), unless a later date is requested in the Application.

**Annotations to "Rule 4"**

*Effective Date.*—In order not to discriminate against any Applicant by reason of geographical location with respect to the "Effective Date" of the insurance which is made available under the Money and Securities program, Fiduciary Agents are authorized to announce that War Damage Corporation will construe the provisions of the Application (WDC Form No. 16) and Rule 4 of Regulations "D" referring to "the date on which the Application is received and date-stamped by the Fiduciary Agent" as meaning (unless a later "Effective Date" is specified in Item 12 of the Application) either of the following:

(a) In any case in which the Application and the premium check are received by the Fiduciary Agent (including the Central Office or any other "branch office" designated by a Fiduciary Agent to issue WDC policies and otherwise to act on its behalf) by mail, the cancellation date on the envelope enclosing such Application (or, if such cancellation date is illegible, the latest possible date of mailing computed retrospectively from the time of arrival); and

(b) In any case in which the Application and premium check are received by the Fiduciary Agent (including the Central Office or the Home Office, but excluding any "branch office" other than the Central Office) by personal delivery, the date such Application is received and date-stamped by such Fiduciary Agent.

Fiduciary Agents are hereby authorized to proceed in accordance with the foregoing in issuing policies of insurance and in specifying the "Effective Date" thereof. [Memorandum to Fiduciary Agents (Money and Securities Program) No. 1, December 14, 1942.]

The "Effective Date" specified in Memorandum to Fiduciary Agents (Money and Securities Program) No. 1, dated December 14, 1942 (set forth above) is hereby made applicable to the "Application for Change in Insurance" (WDC Form No. 17). [Memorandum to Fiduciary Agents (Money and Securities Program) No. 2, February 26, 1943.]

**Policy Form—Rule 5**

Insurance will be written only on the form of Policy prescribed by the Corporation. (See specimen form of Policy, WDC Form No. 1 (a), appended to these Regulations.) The Policy will cover only direct loss through damage to or destruction of the Money and Securities insured.

**Cancellation—Rule 6**

The Policy may not be cancelled upon the request of the Insured. If the Policy is issued in violation of these Regulations, the Policy may be cancelled by the Corporation by delivering or mailing to the Insured at the address given in the Application, five days' written notice. In the event of cancellation, the pro rata "Net Premium" shall be returned.

**Net Premium—Rule 7**

The term "Net Premium" shall mean: the Gross Premium less (a) the Producer's service fee (5%—subject to the minimum and maximum provided in Rule 10), and (b) the Fiduciary Agent's expense reimbursement (3½%—subject to the minimum and maximum allowable in accordance with the "Fiduciary Agent Agreement").

**Reduction of or Addition to Policy Amount—Rule 8**

The Policy may, upon application, be reduced in amount in the event that the Insured ceases to hold Money or Securities at the locations or in the amounts specified in the Application and the return premium due the Insured shall be calculated on a pro rata "Net Premium" basis. The Policy may, upon application, and upon payment of the proper premium, be increased in amount, subsequent to the "Effective Date," to cover Money or Securities in additional amounts or at additional locations. Reporting forms of policies will not be issued. No Producer's service fee or Fiduciary Agent's expense reimbursement shall be paid on additional premiums. No payment shall be required by or made by the Corporation where the additional or return premium is less than fifty (50) cents.

**Annotations to "Rule 8"**

**Application for Change in Insurance.**—"Application for Change in Insurance (WDC Form No. 17) has been prepared for use in connection with changes in insurance under Money and Securities Policies [WDC Form No. 1 (a)]." [Memorandum to Fiduciary Agents (Money and Securities Program) No. 2, February 26, 1943.]

**Loss Adjustments—Rule 9**

In the event of loss, the Insured shall, as soon as practicable, give written notice to the Fiduciary Agent through which the Policy was issued, and the Insured shall comply with the provisions of the Policy relating to "Requirements in Case of Loss." Adjustment and settlement of the loss will be effected in accordance with the Corporation's established procedure.

**Service Fee to Producer—Rule 10**

The service fee to the Producer shall not exceed 5% of the premium, with a minimum fee of \$1.00 per Policy, and a maximum fee of \$1,000 per Policy. *The service fee shall not be deducted from the remittance which accompanies the Application.* The service fee shall be paid on each Policy issued, and shall become due upon the issuance of the Policy and shall be payable on or before the 20th day of the month following. Service fees shall be paid on renewals. Service fees shall be paid only to Producers. (For provisions relating to service fees in connection with additional or return premiums, see Rule No. 8.)

**Other Insurance—Rule 11**

The "Other Insurance" clause of the Policy provides that if there is any other insurance covering the Money and Securities, whether prior to, subsequent to, or simultaneous with the insurance under the Policy, which in the absence of the insurance under the Policy would cover the loss or damage covered by the Policy, then the insurance under the Policy becomes "excess insurance" and does not apply except over and above such other insurance.

**Premium Rates—Rule 12**

The rates for coverage under the Policy are set forth in Item 10 of the Application and are as follows:

Coverage	Annual rate per \$1,000 of insurance	
	Money	Securities
A.....	\$0.25	\$0.075
B.....	.50	.15
C.....	1.00	.30
D*.....	1.50	.45

\*In any case in which the Application specifies insurance under both Coverage C and Coverage D, the "Premium Subtotal" (as shown in Item 10 of the Application) shall be credited with ½ of the premium therein calculated for Coverage C, but such credit shall not exceed ½ of the premium therein calculated for Coverage D. The foregoing credit shall be separately available in connection with the calculation of the premium for Coverage D on Money and Securities, respectively.

The Producer shall determine the proper premium for the Coverage applied for under the Application and shall insert such premium in the appropriate space provided on the Application.

**Minimum Premium—Rule 13**

The minimum premium shall be \$3.00 per Policy.

**Maximum Limits on Amount of Insurance—Rule 14**

The following maximum limits shall apply with respect to the amount of insurance for each Applicant under the following types of coverage:

		<i>Limit for each specified Premises of Safe Deposit Box</i>
<b>Money:</b>		
Coverage A	-----	\$750,000
Coverage B	-----	750,000
Coverage C	-----	450,000
		<i>Limit for each Policy</i>
Coverage D	-----	\$2,000,000
		<i>Limit for each specified Premises, Safe-Deposit Box, or Custodian</i>
<b>Securities:</b>		
Coverage A	-----	\$5,000,000
Coverage B	-----	5,000,000
Coverage C	-----	3,000,000
		<i>Limit for each Policy</i>
Coverage D	-----	\$10,000,000

**Annotations to "Rule 14"**

**Maximum Limits on Amount of Insurance.**—Reference is made to Rule 14 of WDC Regulations "D" wherein certain limits are set forth for insurance on Money and Securities under Coverages A, B, C, and D, respectively. Fiduciary Agents are hereby authorized to grant, without reference to the Corporation, extended limits of coverage up to, but not exceeding, \$5,000,000 for Money and \$25,000,000 for Securities with respect to Coverages A, B, C, and D, respectively. War Damage Corporation is willing to consider the granting of coverage beyond the foregoing extended limits in particular cases, upon receipt by War Damage Corporation of an appropriate recommendation of the Fiduciary Agent (Central Office). [Memorandum to Fiduciary Agents (Money and Securities Program) No. 2, February 26, 1943.]

FD-1 Form No. 1(a)  
Revised 1-1-41

No. \_\_\_\_\_

# War Damage Corporation

(A Corporation created by Reconstruction Finance Corporation pursuant to Section 24 of the Reconstruction Finance Corporation Act, as amended, herein called the "Corporation")

WASHINGTON, D. C.

## MONEY AND SECURITIES POLICY

1 ISSUED TO: \_\_\_\_\_  
(herein called the "Insured")

2 Mail address: \_\_\_\_\_

3 Effective date: \_\_\_\_\_

4 **In Consideration** of the payment of the premium, the Corporation agrees to pay to the Insured or legal  
 5 representatives the amount of direct loss through damage to or destruction of the Money and Securities covered here-  
 6 under and owned by the Insured or held by the Insured in any capacity, which may result from **ENEMY ATTACK, IN-  
 7 CLUDING ANY ACTION TAKEN BY THE MILITARY, NAVAL OR AIR FORCES OF THE UNITED STATES  
 8 IN RESISTING ENEMY ATTACK.**

9 This insurance shall take effect on the effective date herein stated, at noon, standard time at the mail address of  
 10 the Insured herein stated, and shall terminate twelve months thereafter, at the same hour.

11 Assignment of this policy shall not be valid except with the written consent of the Corporation.

The representations, terms and conditions of the application attached hereto and the provisions printed on the fol-  
 12 lowing pages are made a part of this policy, and this policy shall also be subject to such other provisions, stipulations  
 13 and agreements as may be added hereto, over the signature of a duly authorized Fiduciary Agent.

14 **In Witness Whereof**, the Corporation has executed this policy, but this policy shall not be valid unless  
 15 countersigned by a duly authorized Fiduciary Agent of the Corporation.

17

Attest:

*W. H. Krum*  
 SECRETARY

WAR DAMAGE CORPORATION

*W. Clayton*  
 PRESIDENT

18 Countersigned this \_\_\_\_\_ day of \_\_\_\_\_, 194\_\_\_\_\_

19 \_\_\_\_\_  
(Authorized Fiduciary Agent)

20 By \_\_\_\_\_

**11 AMOUNT OF****12 LOSS**

13 The amount of loss hereunder shall not exceed the actual value at the time of loss of 14 the Money and Securities damaged or destroyed. The value 15 of any Securities for the loss of which claim shall be made 16 hereunder, shall be determined by the closing market value 17 of such Securities on the business day next preceding the 18 date of such loss. If such Securities have no quoted or 19 market value, their value shall be determined by agreement 20 or by appraisal as set forth herein under "Appraisal." The 21 Corporation reserves the right to replace in kind such 22 Money and Securities.

**23 NEGLECT OF****24 INSURED**

25 The Corporation shall not be liable for loss caused directly or indirectly by neglect of 26 Insured to use all reasonable means to save and preserve 27 the Money and Securities after damage resulting from the 28 perils herein covered.

**29 OTHER INSURANCE**

30 If there is any other insurance covering the Money and Securities 31 insured hereunder, whether prior to, subsequent to, 32 or simultaneous with this insurance which in the absence of 33 this insurance would cover the loss or damage hereby covered, then the Corporation shall not be liable hereunder 34 for more than the excess over and above such other insurance.

**35 CANCELLATION**

36 This policy may be cancelled only if it is issued in violation 37 of the Regulations of the Corporation in effect at the time 38 of issuance, in which event it may be cancelled by the Corporation by delivering or mailing five days' written notice 39 to the Insured at the address stated in the application attached hereto. In the event of cancellation, the net premium shall be prorated and returned in conformity with 40 the Regulations of the Corporation.

**41 REQUIREMENTS IN****42 CASE OF LOSS**

43 In the event of loss the Insured shall give, as soon as practicable, written notice to the 44 Corporation, furnish a complete inventory of the damaged 45 or destroyed Money and Securities, and file with the Corporation a proof of loss within 60 days after the loss, unless such time is extended by the Corporation in writing. 46 Such proof of loss, signed and sworn to by the Insured, 47 shall state the Insured's knowledge and belief as to the 48 time and origin of the loss, the interest of the Insured and 49 all others in the Money and Securities, and all contracts 50 of insurance covering any of such Money and Securities. 51 As often as may be required, the Insured shall exhibit to 52 any person designated by the Corporation all that remains 53 of any Money and Securities herein covered; submit to 54 examinations under oath by any person named by the Corporation and subscribe the same; and, as often as may be 55 required, produce for examination all books of account and 56 other vouchers, or certified copies thereof if originals be 57 lost, at such reasonable time and place as may be designated by the Corporation and permit extracts and copies 58 thereof to be made. Any claim for loss under this policy shall 59 be filed with the Corporation, by, through, or in the name 60 of the Insured, with proof of ownership and financial interests of others as hereinabove provided.

**61 EXTENSION OF****62 TIME**

63 If the Insured is unable to comply with any of the provisions of this policy applicable to a 64 loss, because of enemy action, occupation or control, the 65 Insured's right of recovery shall not be prejudiced, provided

66 the Insured shall comply with such provisions within a 67 reasonable time, but in no event later than six months, 68 the Insured becomes able to do so.

**69 APPRAISAL**

70 In case the Insured and the Corporation fail to agree 71 on the amount of loss, then, on the written demand of either 72 each shall select a competent and disinterested appraiser 73 and notify the other of the appraiser selected within 74 93 days after such demand. The appraisers shall first select 75 a competent and disinterested umpire, and, in the event of 76 their failure within fifteen days to agree upon such an 77 umpire, on request of the Insured or the Corporation, 78 an umpire shall be selected by a Judge of a Federal Court 79 of the district of the mail address of the Insured. The 80 appraisers shall then determine the amount of loss, and 81 agree to agree, shall submit only their differences to the 82 umpire. An award in writing of any two when filed with the 83 Corporation shall determine the amount of loss. The 84 appraiser shall be paid by the party selecting him as 85 expenses of the appraisal and the umpire shall be paid 86 the parties equitably.

**87 PAYMENT OF****88 LOSS**

89 Any loss shall be payable within thirty days after proof of loss as herein provided, in full or by the Corporation and ascertainment of the loss is 90 either by agreement between the Insured and the Corporation, 91 or by the appraisers and the umpire, or by the filing with the 92 Corporation of an award as herein provided. Upon agreement 93 between the Insured and the Corporation, expressed in writing, 94 in regard to the existence and amount of loss, the loss or 95 portion thereof so agreed upon shall be payable as soon as 96 practicable thereafter. Any loss payable under this policy 97 shall be paid only to the Insured, or to the order of the 98 Insured.

**99 SUIT**

100 No suit or action for recovery of any claim shall be brought in any court of law or equity unless all the requirements of this policy shall have been complied with, 101 unless commenced within twelve months after filing of the 102 proof of loss.

**103 SUBROGATION AND****104 SALVAGE**

105 Upon payment hereunder of any loss, the Corporation may require 106 the Insured to assign all of its rights, title and interest in 107 and to the Money and Securities concerned in such loss and the execution of all papers and documents necessary 108 to effect recovery on account of such loss. In the event of 109 recovery, from any source other than insurance, such as 110 ship, indemnity or reinsurance, whether made by the 111 Insured or the Corporation, on account of any loss or 112 within the coverage of this policy, the net amount of 113 recovery, after deducting the actual cost and expenses 114 making same, shall be applied first to such an extent as 115 fully to make whole the Insured on account of such loss, 116 and the excess of such recovery shall belong to and be the 117 property of the Corporation.

**118 WAIVER**

119 No permission affecting this insurance shall exist, or validly be given, unless such 120 provision be valid, unless granted herein or incorporated 121 in writing added hereto by the duly authorized Field 122 Agent. No provision, stipulation or forfeiture shall be 123 waived by any requirement or proceeding on the part of 124 the Corporation relating to appraisal or to any other condition 125 provided for herein.

**GLASS REINSURANCE PROGRAM**

NATIONAL BUREAU OF CASUALTY AND SURETY UNDERWRITERS,  
New York City, October 2, 1942.

Reinsurance of war risk under existing glass insurance policies issued prior to October 1, 1942.

Mr. F. A. CHRISTENSEN,  
Executive Vice President, War Damage Corporation,  
Washington, D. C.

DEAR MR. CHRISTENSEN: The casualty companies writing glass insurance have incorporated in policies effective on and after October 1, 1942, an exclusion of loss due to "enemy attack including any action taken by the military, naval, or air forces of the United States in resisting enemy attack." Glass insurance poli-

cies which became effective prior to that date do not contain any war risk exclusion. In consequence, the companies would be liable for any war risk losses arising under such policies up to their respective expiration dates.

Rates for glass insurance are based upon experience of the past and as there have been no war risk losses in such experience the rates have not included a charge for the war hazard. Furthermore, combined experience figures show a slight underwriting loss for several years, so that there has been no redundancy in rates which might be assigned to the war hazard.

It would be a difficult task to attempt to exclude war risk under glass insurance policies which became effective prior to October 1, 1942. Such an exclusion can be effected only through signed acceptance of the restriction by the assured, with cancellation of the policy where not so accepted. The average annual glass premium is only about \$20, which means that the effort and expense involved in reformation or cancellation would be not only substantial but wholly disproportionate to the premium involved. Furthermore, public reaction to the acceptance of a program of modification of contracts now in force under penalty, otherwise, of cancellation might well be most unfavorable.

Feeling that they cannot prudently continue to carry under present-day conditions a risk for which no compensation has been received, and that it is not desirable to exclude the war-risk hazard from policies already in effect, except as a last resort, the carriers hope that the War Damage Corporation will be willing to consider favorably a program of reinsuring the war-risk hazard under such policies.

At a recent meeting of casualty companies writing glass insurance, the following committee was authorized to endeavor to effect a reinsurance agreement with the War Damage Corporation:

Mr. Robert I. Catlin, Aetna Casualty & Surety Co.

Mr. Floyd N. Dull, Continental Casualty Co.

Mr. Hubert W. Yount, Liberty Mutual Insurance Co.

Mr. William Leslie, National Bureau of Casualty & Surety Underwriters (chairman)

The committee submits for your consideration the attached outline of such a reinsurance program and respectfully requests the opportunity to discuss this subject with representatives of the War Damage Corporation at the earliest date convenient to such representatives.

Yours very truly,

GLASS WAR RISK COMMITTEE,  
By WM. LESLIE, *Chairman*.

**Enclosures:**

1. Outline of glass-reinsurance proposal.
2. Copy of comprehensive glass policy in general use among all companies writing glass insurance.
3. List of companies that have agreed to subscribe to this reinsurance agreement if it can be negotiated with the War Damage Corporation.

**OUTLINE OF GLASS REINSURANCE PROPOSAL**

**1. Amount of Reinsurance**

The carriers subscribing to this agreement would purchase from the War Damage Corporation reinsurance up to an aggregate amount of \$100,000,000 in respect of any losses incurred under existing glass policies issued prior to October 1, 1942, as a result of enemy attack, including any action taken by the military, naval, or air forces of the United States in resisting enemy attack.

**2. Premium for Reinsurance**

The carriers would pay to the War Damage Corporation a premium calculated at the rate of 25¢ per \$100 of insurance, or \$250,000.

**3. Basis of Fixing the Amount of Reinsurance**

(a) *Determination of Glass Values.*—Glass insurance premiums generally are based upon the size of the glass rather than its appraised value. Consequently, there is not available any record of individual or aggregate insured values based upon an appraisal of each insured risk. But taking into account the known replacement cost (actual values) for the typical size of insured glass in each of the various rating territories of the country, it is not difficult to establish with reasonable accuracy an average relationship between premiums and glass values. These ratios have been established separately for each of the coded cities,

States, Territories, and possessions specified in the War Damage Corporation rating plan, and are shown on attached Exhibit A. It will be noted that on the average for the country as a whole, each dollar of glass premiums represents approximately \$10.70 worth of insured glass at full value, or a ratio of 1 to 10.7.

(b) *Exposure to Loss*.—The exposure to loss is a function both of the value of the insured glass (replacement cost) and the term for which the insured glass is exposed to war risk as defined. Some of the reinsured policies will expire the following day. Others will expire on successive days until the end of the reinsurance term. The unearned premium reserve at any given date measures the exposure to loss in terms of premium. Applying the actual factor of 10.6981 to the unearned premium reserve, translates this measurement into terms of glass values. The carriers which to date have signified their desire to subscribe to this agreement had an unearned premium reserve at December 31, 1941, of \$8,381,301. In terms of glass values this is equivalent to \$89,663,998, which represents the estimated average value of insured glass exposed to loss for the equivalent of one full year. Bearing in mind that insured glass which is broken may be replaced and again exposed to loss, as well as the fact that the ratio of insured glass values to premiums is in the nature of a reasonable approximation, the carriers believe that a rounded figure of \$100,000,000 is a reasonably safe maximum estimate of the aggregate value of all insured glass.

#### 4. Territorial Limitation

The reinsurance would be limited to glass insurance policies covering risks located in the continental United States, Alaska, Canal Zone, Hawaii, and Puerto Rico.

#### 5. Term of Reinsurance

The reinsurance would cover the unexpired terms of glass policies issued prior to October 1, 1942, during the period from the effective date of the agreement to October 1, 1945.

#### 6. Subscribing Carriers

All authorized carriers writing glass insurance in the continental United States, Alaska, Canal Zone, Hawaii, and Puerto Rico will be asked to indicate whether or not they would be willing to subscribe to this reinsurance agreement if it is successfully negotiated. To date 90 carriers writing about 91 percent of the glass business have signified their desire to subscribe.

#### 7. Participation in Profit or Loss

The carriers agree to accept a 10-percent participation in any underwriting profit or loss under this reinsurance agreement up to a maximum of \$1,000,000.

#### 8. Expenses

The carriers agree to assume all expense involved in the settlement of losses other than the actual cost or expense involved in making replacements of glass or fittings, the latter being an integral part of the loss as defined under plate-glass policies.

#### 9. Salvage

The carriers agree that any salvage recovered or any reimbursement received from any other source on account of such reinsured loss, less the expense incurred in effecting such recovery or reimbursement, shall be deducted from the amount to be paid by the War Damage Corporation.

#### 10. Fiduciary Agent

In order to accomplish an economical and efficient functioning of reinsurance transactions under the proposal submitted, it is suggested that each of the subscribing carriers authorize and appoint a single fiduciary agent to act on behalf of all carriers in all transactions with the War Damage Corporation; such single agent to keep and maintain all books and records, receive premiums from subscribing carriers, and pay same to the War Damage Corporation, and, if any losses occur, function as a central agency to receive advices of these losses from the participating carriers and obtain reimbursement from the War Damage Corporation under the terms of the reinsurance agreement.

Attachment: Exhibit A—Ratio of glass premiums to glass values.

OCTOBER 2, 1942.

EXHIBIT A.—*Exhibit of glass values exposed to loss as of Dec. 31, 1941*

(1) Territory	(2) Unearned premium reserve as of Dec. 31, 1941	(3) Ratios of replacement cost to premiums	(4) Full value of insured glass (2 by 3)
Alabama:			
Birmingham.....	\$21,708	10.5	\$227,934
Remainder of State.....	25,485	13.4	354,899
Alaska: Entire.....	1,592	12.4	19,741
Arizona: Entire.....	19,183	10.0	191,030
Arkansas: Entire.....	39,560	10.5	415,380
California:			
Los Angeles.....	131,000	11.7	1,532,700
Oakland.....	33,190	14.7	487,593
San Francisco.....	106,191	12.5	1,327,388
Remainder of State.....	223,948	16.4	3,672,747
Colorado:			
Denver.....	30,340	12.5	379,250
Remainder of State.....	26,150	12.0	313,800
Connecticut: Entire.....	139,046	13.2	1,835,407
Delaware: Entire.....	14,332	12.2	174,850
District of Columbia: Entire.....	101,246	7.1	718,847
Florida: Entire.....	66,883	12.5	836,038
Georgia:			
Atlanta.....	31,765	9.8	311,297
Remainder of State.....	36,459	11.3	411,987
Hawaii: Entire.....	8,717	27.1	236,231
Idaho: Entire.....	13,326	11.2	149,251
Illinois:			
Chicago.....	674,443	10.4	7,014,207
Remainder of State.....	205,677	11.6	2,385,853
Indiana:			
Indianapolis.....	42,409	11.7	496,185
Remainder of State.....	157,401	13.6	2,140,654
Iowa: Entire.....	89,512	13.1	1,172,607
Kansas: Entire.....	55,149	12.0	661,788
Kentucky:			
Louisville.....	28,664	9.1	260,842
Remainder of State.....	49,785	12.5	622,313
Louisiana:			
New Orleans.....	25,395	16.8	426,636
Remainder of State.....	36,962	12.7	469,417
Maine: Entire.....	30,173	15.0	452,595
Maryland:			
Baltimore.....	77,108	11.0	848,188
Remainder of State.....	43,751	10.1	441,885
Massachusetts:			
Boston.....	112,142	8.3	930,779
Remainder of State.....	226,620	12.0	2,719,560
Michigan:			
Detroit.....	257,390	6.4	1,647,296
Remainder of State.....	171,565	9.7	1,664,181
Minnesota:			
Minneapolis.....	54,730	8.4	459,732
St. Paul.....	21,037	10.1	212,474
Remainder of State.....	45,678	9.8	447,644
Mississippi: Entire.....	26,988	12.0	323,856
Missouri:			
Kansas City.....	54,981	6.8	373,871
St. Louis.....	94,038	10.3	968,591
Remainder of State.....	52,383	12.7	665,264
Montana: Entire.....	12,404	6.7	83,107
Nebraska: Entire.....	49,198	9.9	487,060
Nevada: Entire.....	8,800	11.1	97,680
New Hampshire: Entire.....	17,517	21.0	267,857
New Jersey:			
Jersey City.....	47,103	8.5	400,376
Newark.....	92,949	8.9	827,246
Remainder of State.....	292,675	32.7	3,718,973
New Mexico: Entire.....	19,276	9.1	175,412
New York:			
Buffalo.....	57,160	15.0	857,400
New York City.....	1,411,830	7.4	10,447,542
Rochester.....	29,586	14.1	417,163
Remainder of State.....	473,208	12.1	5,725,817
North Carolina: Entire.....	68,559	12.5	856,988
North Dakota: Entire.....	8,130	7.5	60,975
Ohio:			
Cincinnati.....	43,331	11.2	485,307
Cleveland.....	143,404	8.1	1,161,572
Columbus.....	21,540	10.5	226,170
Toledo.....	25,060	10.7	268,142
Remainder of State.....	224,932	12.6	3,046,836

EXHIBIT A.—*Exhibit of glass values exposed to loss as of Dec. 31, 1941*—Con

(1) Territory	(2) Unearned premium reserve as of Dec. 31, 1941	(3) Ratios of replacement cost to premiums	(4) Full value of insured glass (2 by 3)
Oklahoma: Entire.....	\$89,261	13.2	\$1,178,245
Oregon:			
Portland.....	20,031	20.6	412,639
Remainder of State.....	17,517	18.1	317,058
Panama Canal Zone: Entire.....	1,257	8.9	11,187
Pennsylvania:			
Philadelphia.....	250,182	8.2	2,051,492
Pittsburgh.....	129,659	9.9	1,283,624
Remainder of State.....	208,458	13.0	3,879,954
Puerto Rico: Entire.....	6,370	9.5	60,515
Rhode Island:			
Providence.....	30,592	10.4	318,157
Remainder of State.....	28,832	11.7	337,334
South Carolina: Entire.....	36,124	14.8	534,635
South Dakota: Entire.....	8,130	7.8	63,414
Tennessee:			
Memphis.....	18,523	10.5	194,492
Remainder of State.....	50,120	12.7	636,524
Texas:			
Dallas.....	24,390	10.0	243,900
Houston.....	16,427	8.0	131,416
San Antonio.....	15,003	11.1	166,533
Remainder of State.....	136,196	9.6	1,397,482
Utah: Entire.....	20,450	11.9	243,355
Vermont: Entire.....	11,482	12.9	148,118
Virginia: Entire.....	107,700	11.2	1,206,240
Virgin Islands: Entire.....	84	8.9	748
Washington:			
Seattle.....	31,179	12.6	392,855
Remainder of State.....	34,699	14.8	513,745
West Virginia: Entire.....	59,256	9.5	562,932
Wisconsin:			
Milwaukee.....	79,706	9.7	773,148
Remainder of State.....	102,252	15.0	1,533,780
Wyoming: Entire.....	6,537	7.2	47,066
<b>Total.....</b>	<b>8,381,301</b>	<b>10.7</b>	<b>89,663,998</b>

## COMPREHENSIVE GLASS POLICY

THE \_\_\_\_\_ COMPANY  
(A Stock Company Herein Called The Company)

DOES HEREBY AGREE with the Assured named in Item (a) of the Schedule forming a part hereof, as respects the glass, lettering, and ornamentation described and stated therein to be issued hereunder, to INDEMNIFY THE ASSURED for:

*Damage to glass*

I. All damage to such glass, lettering, and ornamentation, caused by:

(a) the accidental breakage of such glass, except damage by fire in the Assured's premises or elsewhere;

(b) acids or chemicals accidentally or maliciously applied thereto provided such glass, lettering, or ornamentation so damaged is thereafter unfit for use for the purpose for which it was being used immediately preceding the occurrence of such damage;

*Damage to showcase frames and sashes*

II. The cost (not exceeding \$75) of repairing, or replacing with like material, showcase frames and sashes immediately encasing and contiguous to the insured glass, provided that such repairing or replacing is made necessary by such damage to the insured glass;

*Temporary installation*

III. The cost (not exceeding \$75) of boarding up, or installing temporary plates, in, the windows in which such broken insured glass is located provided such boarding up or temporary installation is necessitated by unavoidable delay in replacing any broken glass insured hereunder;

***Removal of obstructions***

IV. The cost (not exceeding \$75) of removing and replacing any fixtures or other obstructions (excluding show-window displays) necessary to the replacement of any such damaged glass insured hereunder.

***Limits of indemnity***

V. The Company's liability under Paragraph I shall be limited to the true value of such glass, lettering, and ornamentation, including the cost of replacement thereof, at the time of damage, not exceeding the applicable amount of insurance stated in the Schedule. As respects loss due to any one occurrence at each store or other premises separately occupied or designed for separate occupancy, the Company's liability under each of Paragraphs II, III, and IV shall be limited to \$75 but shall not exceed \$150 under any two or more of said Paragraphs combined.

***Policy period***

VI. This agreement shall apply only to such Damage occurring within the Policy Period as herein defined or within any extension thereof under Renewal Certificate issued by the Company.

This agreement is subject to the following conditions:

***Payments and replacements***

A. The Company shall replace, without unnecessary delay, any such damaged glass, lettering, or ornamentation insured hereunder, or pay for the same in money within the limits provided herein, as the Company may elect. In either case the damaged glass shall be the property of the Company.

***Notice of damage***

B. Written notice of any damage covered hereby, with full particulars so far as can be determined, shall be given to the Company as soon as practicable, and the Assured shall make all reasonable efforts to preserve the glass and to prevent further damage. The Company may require the Assured to file affirmative proof of damage under oath on forms provided by the Company, together with full particulars of such damage.

***Other insurance***

C. If the Assured carries other insurance covering such damage as is covered by this Policy, the Company shall not be liable for a greater proportion of any such damage than the amount applicable thereto as hereby insured bears to the total amount of all valid and collectible insurance covering such damage.

***Limitations***

D. No suit shall be brought under this Policy until forty days after the damage occurs, nor at all unless commenced within two years from such date. If any limitation of time for notice of loss or for any legal proceeding herein contained is shorter than that permitted to be fixed by agreement under any statute relating thereto in force in the state in which the Assured's premises designated herein are located, the shortest permissible statutory limitation of time shall govern and shall supersede any condition in this Policy inconsistent therewith.

***Subrogation***

E. The Company shall be subrogated to the extent of any payment hereunder to all of the Assured's rights of recovery against any third party, and the Assured shall execute all papers required and shall do everything necessary to secure such rights.

***Cancellation***

F. This Policy may be canceled by the Assured by mailing written notice to the Company stating when thereafter such cancellation shall be effective, in which case the Company shall refund the excess of premium paid by the Assured above the customary short rate premium for the expired term. This Policy may be canceled by the Company by mailing written notice to the Assured at his business address shown in Item (b) of the Schedule stating when not less than five days thereafter such cancellation shall be effective, in which case the Company shall refund the excess of premium paid by the Assured above the pro rata premium for the expired term. The mailing of notice as aforesaid shall be sufficient proof of notice and the effective date and hour of cancellation stated

in the notice shall be the end of the Policy Period. Delivery of such written notice either by the Assured or by the Company shall be equivalent to mailing, and the check of the Company similarly mailed or delivered, shall be a sufficient tender of any refund of premium due the Assured. Reinstatement, if granted by the Company after cancellation, shall be in writing.

#### *Assignment*

G. No assignment of interest under this Policy shall bind the Company without its written consent. If the Assured shall die or be adjudged bankrupt or insolvent during the Policy Period, this Policy, unless canceled, shall continue in favor of the legal representative of the Assured, provided written notice shall be given the Company within thirty days after the date of such death or adjudication.

#### *Changes*

H. No provision or condition of this Policy shall be waived or altered except by endorsement issued to form a part hereof and signed by the President, a Vice President, the Secretary or an Assistant Secretary of the Company; nor shall notice to any agent, or knowledge possessed by any agent or by any other person, be held to effect a waiver or change in any part of this Policy. Changes in the written portion of the Schedule if initialed by any Manager, Assistant Manager, or General Agent of the Company, shall bind the Company and the Assured. Personal pronouns used in this Policy shall apply regardless of number or gender.

#### *Consideration*

I. This Policy is issued in consideration of the payment of the premium expressed in Item (d) of the Schedule.

IN WITNESS WHEREOF, The \_\_\_\_\_ Company has caused this Policy to be signed by its President and Secretary at \_\_\_\_\_ and countersigned by a duly authorized Agent of the Company.

\_\_\_\_\_ Secretary \_\_\_\_\_ President  
Countersigned \_\_\_\_\_

#### SCHEDULE

Date Issued \_\_\_\_\_

Item (a). Name of Assured is \_\_\_\_\_

Item (b). Assured's business address is \_\_\_\_\_

Item (c). The kind of business conducted in the premises designated in Item (f) is \_\_\_\_\_

Item (d). The Premium for this Policy is \_\_\_\_\_ Dollars (\$\_\_\_\_\_) payable \$\_\_\_\_\_ in advance, \$\_\_\_\_\_ on first anniversary, and \$\_\_\_\_\_ on second anniversary.

Item (e). The Policy Period shall be from \_\_\_\_\_ to \_\_\_\_\_ at 12 o'clock noon, standard time at the location of the premises as to each of said dates.

Item (f). The glass, lettering, and ornamentation insured hereby are described and located as stated below. Unless especially described and stated herein to be insured hereunder, this policy does not cover lettering or ornamentation, or clamped, glued, bent, wired, leaded, or cathedral glass, or doors, mirrors or show cases, or any glass not set in frames, sashes or bars, or anything other than plain plate flat glass.

	Number of plates	Length in inches	Width in inches	Description of glass, lettering and ornamenta- tion and loca- tion in the premises	Location of prem- ises (street, number, town, county and State)	Specific insurance if any
1.....						
2.....						
3.....						
4.....						
5.....						
6.....						
7.....						
8.....						
9.....						
10.....						
11.....						
12.....						
13.....						
14.....						
15.....						
16.....						

## SHORT RATE CANCELLATION TABLE

The percentages in this table are not subject to modification for periods not shown.

*For term of 1 year*

Periods exceeding 20 days, and not exceeding 25 days, to be the rate of 25 days, and so on

<i>Percent of annual premium</i>		<i>Percent of annual premium</i>	
1 day.....	2	50 days.....	28
2 days.....	4	55 days.....	29
3 days.....	5	60 days.....	30
4 days.....	6	65 days.....	33
5 days.....	7	70 days.....	36
6 days.....	8	75 days.....	37
7 days.....	9	80 days.....	38
8 days.....	9	85 days.....	39
9 days.....	10	90 days or 3 months.....	40
10 days.....	10	105 days.....	45
11 days.....	11	120 days or 4 months.....	50
12 days.....	12	135 days.....	55
13 days.....	13	150 days or 5 months.....	60
14 days.....	13	165 days.....	65
15 days.....	14	180 days or 6 months.....	70
16 days.....	14	195 days.....	73
17 days.....	15	210 days or 7 months.....	75
18 days.....	16	225 days.....	78
19 days.....	16	240 days or 8 months.....	80
20 days.....	17	255 days.....	83
25 days.....	19	270 days or 9 months.....	85
30 days.....	20	285 days.....	88
35 days.....	23	300 days or 10 months.....	90
40 days.....	26	315 days.....	93
45 days.....	27	330 days or 11 months.....	95
		360 days or 12 months.....	100

*For term of 3 years*

Part of a month to be the rate for a whole month

Percent of 3-year premium		Percent of 3-year premium	
1 month	7.4	19 months	55.4
2 months	11.1	20 months	58.
3 months	14.8	21 months	60.7
4 months	18.5	22 months	63.3
5 months	22.2	23 months	65.9
6 months	25.9	24 months	68.5
7 months	27.8	25 months	71.2
8 months	29.6	26 months	73.8
9 months	31.5	27 months	76.4
10 months	33.3	28 months	79.
11 months	35.2	29 months	81.7
12 months	37.	30 months	84.3
13 months	39.6	31 months	86.9
14 months	42.3	32 months	89.5
15 months	44.9	33 months	92.1
16 months	47.5	34 months	94.8
17 months	50.2	35 months	97.4
18 months	52.8	36 months	100.

WAR DAMAGE CORPORATION,  
Washington, February 25, 1943.

*To All Companies Writing Glass Insurance:*

GENTLEMEN: War Damage Corporation is a corporation created by Reconstruction Finance Corporation pursuant to section 5d of the Reconstruction Finance Corporation Act, as amended. By act of Congress approved March 27, 1942, War Damage Corporation has been authorized to provide reasonable protection against loss or damage to real and personal property resulting from enemy attack, including any action taken by the military, naval, or air forces of the United States in resisting enemy attack, with such general exceptions as War Damage Corporation, with the approval of the Secretary of Commerce, may establish.

War Damage Corporation's general war-damage-insurance program is embodied in regulations "A" which became effective July 1, 1942. Under the general program war-damage insurance is available with respect to apartments, hotels, offices, mercantiles, and other buildings in which plate glass may form a part of the construction and the war-damage insurance thus afforded with respect to such buildings extends to cover the plate glass as well as the remainder of the structure.

War Damage Corporation is informed that the policies of plate-glass insurance issued prior to October 1, 1942, by the companies writing plate-glass insurance did not exclude from such plate-glass coverage damage resulting from hazards of war. In view of this circumstance, a so-called Glass War Risk Committee, representing the aforesaid companies, has approached War Damage Corporation for the purpose of making arrangements for the reinsurance of the outstanding war risk and as a result of such negotiations a form of glass reinsurance agreement (three copies of which are enclosed) has been evolved setting forth the proposed basis on which such reinsurance would be made available by War Damage Corporation to interested carriers.

War Damage Corporation has now been informed by Mr. William Leslie, chairman of the Glass War Risk Committee, that in response to his letter addressed under date of January 29, 1943, to all companies writing glass insurance, replies have been received from 76 companies of which 53 companies, representing 70.9 percent of the industry based upon total premium volume for 1941, have indicated a tentative desire to obtain the proposed reinsurance. In order to satisfy this preponderant demand for the proposed reinsurance, War Damage Corporation herewith submits to all carriers writing glass insurance a formal proposal as follows:

War Damage Corporation will enter into a glass reinsurance agreement (in the form herewith enclosed) with any carrier which transmits to War Damage

Corporation, Washington, D. C., prior to March 15, 1943, a telegraphic acceptance as follows:

"WAR DAMAGE CORPORATION,

"Washington, D. C.:

"----- hereby accepts reinsurance proposal set forth  
(Name and address of carrier)  
in War Damage Corporation's letter dated February 25, 1943, and hereby agrees to complete, execute, and transmit to War Damage Corporation forthwith duplicate originals of glass reinsurance agreement therewith enclosed accompanied by full payment of premium in amount of \$----- computed on basis of unearned premium reserve of \$-----."

If such telegraphic acceptance is so received by War Damage Corporation prior to March 15, 1943, the reinsurance provided for in the glass reinsurance agreement shall automatically attach as of March 15, 1943, with respect to the carrier so accepting, provided War Damage Corporation receives on or before April 1, 1943, duplicate originals of the glass reinsurance agreement properly completed and duly executed by the respective carrier and accompanied by full payment of the reinsurance premium, computed in the manner hereinafter set forth. As indicated in the glass reinsurance agreement, the period of the reinsurance is from March 15, 1943, to October 1, 1945. The reinsurance premium shall be computed at the rate of 25 cents per \$100 of the amount at risk. The amount at risk for each carrier shall be deemed to be the amount obtained by multiplying by a factor of 14 the carrier's unearned premium reserve (computed on semimonthly pro rata fractional basis) as of March 15, 1943, based on the carrier's records of glass insurance in force on December 31, 1942, under policies issued to become effective prior to October 1, 1942, and covering glass located within territory specified under paragraph 3 of glass reinsurance agreement. The reinsurance premium thus computed shall be set forth in paragraph 9 of the glass reinsurance agreement and the figure to be inserted in paragraph 10 thereof representing the maximum limit of the respective carrier's loss participation shall be four times the amount of the reinsurance premium. The total limit of War Damage Corporation's liability under all of the glass reinsurance agreements entered into shall be the sum total of the amounts at risk (as hereinabove computed) for all carriers executing such agreements which sum total shall be inserted by War Damage Corporation in the space provided therefor in paragraph 8 of each glass reinsurance agreement. One such fully completed duplicated original of the glass reinsurance agreement will, upon execution by War Damage Corporation, be returned to the respective carrier as soon as may be practicable after April 1, 1943.

It is believed that the form of glass reinsurance agreement is otherwise self-explanatory. It will be observed that paragraph 11 of the glass reinsurance agreement provides that it shall remain in full force and effect for the period thereof (i. e., from March 15, 1943 to October 1, 1945) and shall not be subject to prior cancellation by either party. It is requested that each carrier executing a glass reinsurance agreement transmit to War Damage Corporation as soon as may be practicable a duly certified copy of a resolution or other appropriate documentary evidence of the authority of the executing officer.

Very truly yours,

W. L. CLAYTON, *President.*

Enclosure.

#### GLASS REINSURANCE AGREEMENT

THIS AGREEMENT, made and entered into as of this 15th day of March, 1943, by and between WAR DAMAGE CORPORATION (hereinafter referred to as the "Corporation"), a corporation created by Reconstruction Finance Corporation pursuant to Section 5d of the Reconstruction Finance Corporation Act, as amended, and having its principal office in Washington, D. C., and ----- (hereinafter referred to as the "Reinsured"), organized and existing under and by virtue of the laws of the State of -----, and having its principal office at -----,

WITNESSETH:

WHEREAS, pursuant to Section 5g of the Reconstruction Finance Corporation Act, as amended, the Corporation is authorized to provide reasonable protection against loss of or damage to property, real and personal, which may result from enemy attack (including any action taken by the military, naval or air force of the United States in resisting enemy attack); and

WHEREAS, the Reinsured is engaged in the business of insuring against damage to glass; and

WHEREAS, policies insuring against damage to glass, issued by the Reinsured and other insurers prior to October 1, 1942, did not exclude damage resulting from hazards of war; and

WHEREAS, the Reinsured and certain other insurers are desirous of being re-insured against loss resulting from certain hazards of war, in an aggregate amount to be available with respect to all such loss suffered by any one or more of them;

NOW THEREFORE, in consideration of the premises and of the mutual covenants and agreements, and upon the terms and conditions hereinafter set forth, the parties hereto agree as follows:

1. *Definitions.*—For the purposes of this agreement, the following words shall have the following respective meanings:

(a) *Damage to Glass.*—The words "damage to glass" shall mean, to the extent that the same occurs during the period of this agreement, damage to or destruction of glass, lettering, and ornamentation, including the cost of replacement and of repairing or replacing frames and sashes, boarding up or installing temporary plates in windows, and removing and replacing obstructions necessary to the replacement.

(b) *Loss.*—The word "loss" shall mean only such an amount as is actually paid by the Reinsured under one of the Reinsured Policies for damage to glass, less other applicable reinsurance carried by the Reinsured, recoveries and salvage.

(c) *Reinsured Policies.*—The words "Reinsured Policies" shall mean policies issued by the Reinsured to become effective prior to October 1, 1942, noon, standard time at the location of the glass covered thereby; provided, however, that such words "Reinsured Policies" shall include only the respective original periods of such policies (including any extensions thereof originally made optional with the insured thereunder, but not otherwise).

(d) *Period of this Agreement.*—The words "period of this agreement" shall mean that period of time beginning with the date hereof and ending October 1, 1945.

2. *Reinsurance Obligation.*—The Corporation agrees to indemnify the Reinsured against loss under Reinsured Policies through damage to glass which results from ENEMY ATTACK, INCLUDING ANY ACTION TAKEN BY THE MILITARY, NAVAL OR AIR FORCES OF THE UNITED STATES RESISTING ENEMY ATTACK.

3. *Territory.*—This agreement applies only to glass situated within the Continental United States of America, Alaska, Virgin Islands, Hawaii, Puerto Rico or the Canal Zone.

4. *Payment of Loss.*—Upon receipt at the principal office of the Corporation of proof of loss, the Corporation shall pay the Reinsured therefor, but only to the extent of the Corporation's Reinsurance obligation under paragraph 2 hereof. The Reinsured shall pay to the Corporation the amount of any salvage recovered or reimbursement received by the Reinsured on account of any loss for which payment has been made by the Corporation hereunder, less expenses incurred by the Reinsured in connection with such salvage or reimbursement.

5. *Assignment.*—No assignment of the Reinsured's interest hereunder shall be binding upon the Corporation without its written consent thereto. The Corporation may assign this agreement or its interest hereunder to any other branch or department of the Government and upon any such assignment the assignee shall acquire all the rights, interests, powers and privileges of the Corporation hereunder, and shall be bound by all of the duties and obligations of the Corporation hereunder, it being expressly understood that any such assignment shall be subject to all the rights, powers and privileges of the Reinsured hereunder and shall be conditioned upon the assignee's assumption of all duties and obligations of the Corporation hereunder.

6. *Reinsurance Agent.*—The Reinsured and the other insurers listed on the Schedule attached hereto (such other insurers being hereinafter called the "Other Reinsureds") may appoint and authorize an agent (hereinafter called the "Reinsurance Agent") to act in their joint behalf with respect to all transactions with the Corporation arising under or relating to this agreement and the other agreements substantially identical herewith entered into by and between the Other Reinsureds, respectively, and the Corporation (such other agreements being hereinafter called the "Other Reinsurance Agreements").

7. *Inspection of Records.*—The Corporation may inspect, at all reasonable times, the books, records and papers of the Reinsured and of the Reinsurance Agent, in so far as they relate to the subject matter of this agreement.

8. *Limit of Corporation's Liability.*—The total limit of the Corporation's liability under both this agreement and the Other Reinsurance Agreements shall be \$----- in the aggregate. All payments made by the Corporation under this agreement and all such payments made under the Other Reinsurance Agreements shall be in the chronological order in which the respective damage to glass occurs; provided, however, that with respect to the calendar week (if any) in which the aggregate of all losses (as defined in subparagraph (b) of paragraph 1 hereof) shall exceed the aforesaid total limit of liability, the Corporation shall pay on account of each loss covering damage to glass occurring during such week only the amount of such loss multiplied by a fraction, the numerator of which shall be the portion of said total limit of liability unpaid as of the beginning of such week, and the denominator of which shall be the total amount of the losses covering damage to glass occurring during such week.

9. *Premium.*—The premium for the reinsurance under this agreement is \$-----.

10. *Participation.*—As of October 1, 1945, the Corporation shall prepare a final statement setting forth (a) the aggregate amount of all premiums paid to the Corporation under this agreement and under the Other Reinsurance Agreements and (b) the aggregate amount of all losses paid by the Corporation under this agreement and under the Other Reinsurance Agreements. If the amount of such aggregate losses exceeds the amount of such aggregate premiums, the Reinsured shall forthwith pay to the Corporation an amount, not to exceed \$-----, equal to ten percent of such excess multiplied by a fraction, the numerator of which shall be the amount of the premium paid by the Reinsured hereunder, and the denominator of which shall be the amount of such aggregate premiums; provided, however, that in the event that the aggregate of all losses (as defined in subparagraph (b) of paragraph 1 hereof) shall during the period of this agreement exceed the total limit of the Corporation's liability as set forth in paragraph 8 hereof, such final statement shall be prepared as of the date of such event and the Reinsured shall forthwith pay to the Corporation the amount payable as hereinabove provided. If the amount of such aggregate premiums exceeds the amount of such aggregate losses, the Corporation shall forthwith pay to the Reinsured an amount equal to ten percent of such excess multiplied by the same fraction hereinabove set forth.

11. *Agreement Non-Cancelable.*—This agreement shall remain in full force and effect for the period of this agreement (as defined in subparagraph (d) of paragraph 1 hereof) and shall not be subject to prior cancellation by either party.

IN WITNESS WHEREOF, WAR DAMAGE CORPORATION and ----- have caused this agreement to be executed by their respective duly authorized officers, and their respective corporate seals to be hereunto affixed, duly attested by their respective Secretaries, or Assistant Secretaries, as of the day and year first above written.

Attest:

-----

*Secretary*

Attest:

-----

*Secretary*

WAR DAMAGE CORPORATION,

By -----

By -----

## GLASS REINSURANCE PROGRAM

- Accident & Casualty Insurance Company of Winterthur, Switzerland, New York, N. Y.  
 Aetna Casualty & Surety Co., Hartford, Conn.  
 American Employers' Insurance Co., Boston, Mass.  
 American General Insurance Co., Houston, Tex.  
 American Guarantee & Liability Insurance Co., Chicago, Ill.  
 American Motorists Insurance Co., Chicago, Ill.  
 American States Insurance Co., Indianapolis, Ind.  
 American Surety Company of New York, New York, N. Y.  
 Arex Indemnity Co., New York, N. Y.  
 Associated Indemnity Corp., San Francisco, Calif.  
 Bankers Indemnity Insurance Co., Newark, N. J.  
 Car & General Insurance Corp., Ltd., New York, N. Y.  
 Century Indemnity Co., Hartford, Conn.  
 Commercial Casualty Insurance Co., Newark, N. J.  
 Continental Casualty Co., Chicago, Ill.  
 Dearborn National Casualty Co., Detroit, Mich.  
 Eagle Indemnity Co., New York, N. Y.  
 Employers' Liability Assurance Corp., Ltd., Boston, Mass.  
 Eureka Casualty Co., Philadelphia, Pa.  
 Fidelity & Casualty Company of New York, New York, N. Y.  
 Fireman's Fund Indemnity Co., New York, N. Y.  
 General Accident, Fire & Life Assurance Corp., Ltd., Philadelphia, Pa.  
 Glens Falls Indemnity Co., Glens Falls, N. Y.  
 Globe Indemnity Co., New York, N. Y.  
 Great American Indemnity Co., New York, N. Y.  
 Hartford Accident & Indemnity Co., Hartford, Conn.  
 Home Indemnity Co., New York, N. Y.  
 Home Insurance Company of Hawaii, Ltd., Honolulu, T. H.  
 Home Plate Glass Insurance Co., Washington, D. C.  
 Indemnity Insurance Company of North America, Philadelphia, Pa.  
 Insurors Indemnity & Insurance Co., Tulsa, Okla.  
 London Guarantee & Accident Co., Ltd., New York, N. Y.  
 London & Lancashire Indemnity Co., of America, Hartford, Conn.  
 Maryland Casualty Co., Baltimore, Md.  
 Massachusetts Bonding & Insurance Co., Boston, Mass.  
 Merchants Indemnity Corporation of New York, New York, N. Y.  
 Metropolitan Casualty Insurance Company of New York, Newark, N. J.  
 National Casualty Co., Detroit, Mich.  
 New Amsterdam Casualty Co., Baltimore, Md.  
 New England Casualty Insurance Co., Springfield, Mass.  
 New York Casualty Co., New York, N. Y.  
 Norwich Union Indemnity Co., New York, N. Y.  
 Occidental Indemnity Co., New York, N. Y., (name changed to Western National Indemnity Co.)  
 Pacific Indemnity Co., Los Angeles, Calif.  
 Phoenix Indemnity Co., New York, N. Y.  
 The Preferred Accident Insurance Company of New York, New York, N. Y.  
 Protective Indemnity Co., New York, N. Y.  
 Royal Indemnity Co., New York, N. Y.  
 Standard Surety & Casualty Company of New York, Hartford, Conn.  
 Sun Indemnity Company of New York, New York, N. Y.  
 The Travelers Indemnity Co., Hartford, Conn.  
 United States Casualty Co., New York, N. Y.  
 United States Fidelity & Guaranty Co., Baltimore, Md.  
 United States Guarantee Co., New York, N. Y.  
 The Yorkshire Indemnity Company of New York, New York, N. Y.  
 Zurich General Accident & Liability Insurance Co., Ltd., Chicago, Ill.

## GLASS MUTUAL COMPANIES

- Augusta Mutual Plate Glass Insurance Co., Augusta, Maine.  
 Butchers' Mutual Casualty Company of New York, New York, N. Y.  
 Employers Mutual Liability Insurance Company of Wisconsin, Wausau, Wis.  
 Hardware Mutual Casualty Co., Stevens Point, Wis.  
 Liberty Mutual Insurance Co., Boston, Mass.  
 Lumbermen's Mutual Casualty Co., Chicago, Ill.  
 Merchants Mutual Casualty Co., Buffalo, N. Y.  
 Michigan Mutual Liability Co., Detroit, Mich.

## APPENDIX D

PRESIDENT TRUMAN'S MESSAGE OF AUGUST 20, 1951

## A REPORT RELATIVE TO THE FLOOD DISASTER IN THE MIDDLE WEST OF THE UNITED STATES

*To the Congress of the United States:*

I request your urgent consideration of a matter of grave emergency. A great flood disaster—one of the most terrible in the history of the United States—has struck a vast area of the Middle West. The center of its devastation is the valley of the Kansas River, but destruction is spread through other Kansas valleys and parts of Missouri and Oklahoma, and has touched several of the adjacent States.

From May 15 to early July rain fell almost constantly over an area of thousands of square miles, with the heaviest downpours concentrated in south central Kansas. By early July the streams and rivers of Kansas had risen to unprecedented heights. Reservoirs, where they existed, overflowed. Millions of tons of water plunged downstream, crumbling dikes and levees all along the course and sweeping away homes, farms, businesses, roads, bridges, and communication lines. The crest of the flood hit the concentrated industrial area along the river banks at Kansas City, Kans., and Kansas City, Mo., on July 13, and swept a path of destruction across the entire width of Missouri before its force was spent.

The velocity of the waters, as well as their depth and volume, was without parallel in the recorded history of the region. For the month of July stream flow in central Kansas was 70 times normal.

The loss to the Nation along 1,000 miles of river valleys is now being measured. Already more than \$1 billion in physical damage and at least that much more in loss of income has been counted in preliminary estimates. When the final estimate is in the toll will be greater.

I wish that every Member of the Congress could have flown, as I did, over these valleys at the height of the flood. I wish that every Member of the Congress could now tramp through the desolated cities of Kansas and drive through the wasteland where lie what were some of the richest farm acres in the world, their crops now obliterated.

It is estimated that 30,000 to 40,000 homes were flooded. Of these, some 10,000 or 15,000 are destroyed or have suffered major damage—many beyond repair.

At the peak of the flood, some two or three hundred thousand persons were driven from their homes. At least 20,000 of these are still displaced—living in schoolhouses, churches, auditoriums, trailer camps, temporary housing, or with relatives, friends, or strangers who took them in when the disaster struck.

At least 5,000,000 acres of farm land, including some of the richest and most productive agricultural land in the Nation, has been badly damaged. Land in the path of the floods was gouged and eroded, its topsoil carried away. At least 30,000 farms were wholly or partially under water—many standing under 25 feet or more at the peak and remaining flooded for many days. When the water left, thousands of acres were buried under sand and gravel. Thousands of acres are still covered by "trapped water" and must be drained. A year's crops were destroyed, hundreds of thousands of dollars' worth of livestock killed, several million dollars worth of critical farm machinery and equipment destroyed or seriously damaged.

At least 10,000 miles of fences were destroyed—enough to skirt the perimeter of the United States. Farm buildings were damaged on 17,000 farms.

At least 5,000 small businesses were completely or partially destroyed. Store and factory buildings were swept away, merchandise and equipment ruined.

More than \$1 billion of loss—in property damage, and loss of production and employment—has already been suffered by the industries that are tightly concentrated along the Kansas and Missouri Rivers at Kansas City, Kans., and Kansas City, Mo.

In many cases, particularly upstream, time was too short and trucks too few to allow families to save their furniture and other household possessions. As the crisis struck, organized effort had to be devoted to saving life. Few lives were lost, but many families today have virtually nothing beyond the clothes they wore when they fled, or were rescued from the path of the waters.

In the American tradition, neighbors have taken care of neighbors. Every refugee is being sheltered; everyone is fed. Cities not flooded have "adopted" stricken cities. States and communities with emergency Federal aid are restoring and repairing roads, utilities, and public buildings. A great national organization, the American Red Cross, has done and is doing the heroic emergency job that people stricken with disaster can always count upon. During the crisis, Federal agencies, particularly the units of the Armed Forces in the area, threw all available men and resources into the fight to minimize the destruction.

In the tremendous task of putting families and communities back on their feet, the Federal Government now can do two things: First, under the Disaster Relief Act of 1950, regular activities of several Federal agencies can be specially directed to emergency aid, and \$25 million has been appropriated to assist communities in clearing debris, in health protection, in the emergency repair of public property, and to provide temporary housing and for other emergency relief. Mr. Raymond M. Foley, Administrator of the Housing and Home Finance Agency, is responsible for these funds, and for coordinating Federal agency emergency relief activities.

Thus far, nearly \$11 million have been allocated to Federal agencies and to State governments for reallocation to local governmental units. Temporary housing needs, remaining clean-up costs, and estimates now being completed by States and communities to cover emergency repairs to waterworks, sewer systems, streets, roads, bridges, and other community facilities will probably exhaust the remaining \$14 million, even with the fullest contributions the local governments can themselves make.

Second, a number of lending agencies, including the Department of Agriculture, the Housing and Home Finance Agency, the Veterans' Administration, and the Reconstruction Finance Corporation, can to a limited extent make or insure loans for the rehabilitation of farms, homes, and businesses.

But in a disaster of this magnitude, the combined resources now available to the Federal Government, the States, and the local communities, and private organizations such as the American Red Cross, are far from enough to accomplish the tremendous task of restoring for the Nation the productivity and economic vitality of one of its major regions.

There are two reasons why the Nation must act, and at once, to restore the stricken regions to economic health.

The first is humanitarian. The victims of the flood must be given opportunity to renew their farming, to reopen their businesses, to build new homes, to find employment, and without a crushing burden of new debt for every individual. In this land we do not take the view that a man's misfortune, suffered through no fault of his own, is his own affair, or that a stricken community shall be left to shift for itself. Normally the aid comes from local resources or from those of private relief agencies. But when the disaster spreads beyond the capacity of those resources, then the Nation itself must act to share the loss.

The second reason is that we are now engaged as a nation in a struggle for survival, and we cannot afford to dispense for long with the industrial and agricultural production that came but is not now coming from the flooded areas. The industries in those valleys turned out hundreds of products that are critical in the building of military and economic strength. Our meat supply will be seriously affected by the loss of corn and livestock, and the food supplies of not only this Nation but the whole free world may suffer from the loss of wheat.

Because of the effect of the disaster on the defense effort, I assigned to the Director of Defense Mobilization, Mr. Charles E. Wilson, the task of coordinating long-range Federal rehabilitation activities as distinguished from the emergency relief aid previously described. Mr. Alfred E. Howse, of Mr. Wilson's staff, has been directing this work in the flood area. They have seen to it that priorities have been granted for repair work in the area, and that all types of aid have been extended within the limits of existing laws and funds. The recommendations contained in this message are based upon their estimates, after a month of close observation.

We urgently need to take steps to relieve human suffering and restore economic life in this flood area, and to protect against future losses from disasters of this type.

In the long run, of course, the greatest need is for the prevention of floods, through carefully planned and coordinated programs of conservation and water control. Until flood prevention can be assured, however, other measures are urgently required to meet the needs of the present and of the immediate future.

I recommend, therefore, that the Congress at once approve an appropriation of \$400 million for the following purposes:

1. To indemnify the flood victims for a portion of their loss of real and personal property.
2. To make and guarantee loans on liberal terms for the building of homes and businesses to replace those destroyed.
3. To help farmers drain and rehabilitate their land, replace buildings, and restore the productive capacity of their farms, through on-farm assistance and disaster loans.
4. To permit loans where necessary to enable State and local government participation in the rehabilitation activities.
5. To provide funds to establish a national system of flood disaster insurance, similar to the war damage insurance system of World War II.

To administer the program, I expect to establish a Flood Disaster Administration as a small policy and control body, with operating functions placed in existing Federal and State departments and agencies.

Under the circumstances, a broad degree of discretion in administering the rehabilitation funds is necessary. In this emergency, speed of action is all-important. Winter is approaching, and congressional authorization for Federal aid cannot be delayed to await the development of fully detailed plans for the administration of aid in the variety of individual circumstances that will arise. A broad legislative directive will let the stricken region know in general what can be counted on, so that individuals and communities can make plans for going ahead with rehabilitation activities.

The loan programs represent no new departure in Government policy. My recommendations will simply increase the available funds and remove certain normal limitations which are inappropriate in a disaster of this magnitude.

But loans, even on liberal terms, are not enough to meet this situation. People who lost their homes, farms, and businesses now have little or no security to offer a lender. Very few, if any, individuals or businesses had any insurance protection against their flood losses. Generally speaking, private insurance companies have not offered such protection, because of the uncertain nature of the risk. Consequently, many people were left after the flood with nothing, or with nothing but their debts. If they could borrow more, new loans added to the old ones would create a debt burden that for an indefinite time to come would be a drag on the economic vitality of the region and would impair its ability to contribute to building our national security.

For these reasons, I consider it essential to provide some rehabilitation grants, directed particularly to assist wage earners and small farmers and businessmen, whose losses in this flood represented personal financial tragedy. To accomplish the most in rehabilitation with the money available, the indemnity program should provide a sliding scale. For example, on the first \$10,000 of loss (after deducting a standard amount of perhaps \$200), the payment might be 80 percent on the next \$10,000, 60 percent, and so on, with a maximum payment of perhaps \$20,000 for any one claimant. The ceiling would exclude the bulk of the industrial losses, but it would enable individuals and small businesses to make a prompt new start. Fortunately, most of the large industrial concerns affected have other resources; and many are, in fact, already proceeding with reconstruction of their plants.

As part of the rehabilitation program, local redevelopment plans should be required in some cases to assure that rebuilding does not take place in areas subject to recurrent flooding. For example, some of the devastated urban areas could best be converted to parks, recreation areas, or other public uses to minimize the amount of investment in construction on flood plains.

The whole aid program must be carried out on a basis of joint participation by Federal, State, and local governments. The States and cities that are affected have already spent much in restoring their own public services. Nevertheless, the States, and where possible the cities, should share the cost of the whole program on some equitable basis.

The lack of a national system of flood-disaster insurance is now a major gap in the means by which a man can make his home, his farm, or his business secure against events beyond his control. It is a basic requisite to the rapid reopening of plants in the flood region, where dikes cannot be rebuilt for some months, and companies are unwilling, in some cases, to undertake the risk of being inundated in the meantime.

The system of flood insurance should be based, if possible, upon private insurance with reinsurance by the Government. This was the principle of the war-risk insurance in effect in World War II. It depends, of course, upon the demonstration by private insurers that they can meet the needs of those seeking insurance at reasonable rates.

Once the system of flood insurance is in effect, there should be no need in the future for a program of partial indemnities such as is now proposed for the Midwest flood victims. As a permanent national policy insurance is far superior to direct Federal payments.

Suggested appropriation language to carry out these recommendations is attached to this message.

The major features of the indemnification proposals I am making are similar to those already introduced in the Congress by Senator Hennings and Representative Bolling, of Missouri. The principles incorporated in all my recommendations have the support of the Governors of Kansas and Missouri and of the Governors' advisory committees which represent major groups within the two States. They will revive a region of the Nation now badly hurt—a region of such importance to the security and welfare of the whole country that its revival must be the immediate concern of all our citizens.

I urge the adoption of this program as an emergency measure. Whatever is done must be started with the greatest speed.

Homeless families must be rehoused quickly. Industrial production and transportation must be restored. To avert the loss of next year's farm production from much of the flooded land, drainage ditches must be opened, debris cleared away, and silted soil seeded to cover crops in the remaining 60 to 90 days before winter sets in. Tax resources of States and communities must be reestablished.

In all of these things, we must move quickly. Every day counts.

HARRY S. TRUMAN.

THE WHITE HOUSE, August 20, 1951.

#### FUNDS APPROPRIATED TO THE PRESIDENT

##### REHABILITATION OF MIDWESTERN FLOOD-STRICKEN AREAS

For expenses necessary to enable the President, through such agencies of the Government (including new agencies which the President is hereby authorized to create) as he may direct, and under such regulations as he may approve, to provide for and to take such measures as he may deem necessary for relief and rehabilitation in the areas declared by the President during July and August 1951 to be disaster areas because of floods, including (a) partial indemnification for physical loss of, or damage to, such tangible real or personal property as may be deemed administratively feasible, but such indemnification (1) shall not exceed \$20,000 for all claims of any one person and shall in no case exceed 80 percentum of an amount equal to the cost of replacing, rehabilitating, repairing, or reconstructing such property (less depreciation), (2) may be required to be contingent upon financial participation of State and/or local governments and compromise of creditors' claims (including claims of Federal agencies which are hereby authorized to be compromised without consideration), and (3) shall be adjusted on account of any assistance, compensation, insurance, or other reimbursement received or due on account of such loss or damage; (b) loans to State and local governments, on such terms and conditions as may be deemed necessary, to enable financial participation by such governments in the indemnification program authorized herein; (c) direct loans, or the guaranteeing of loans made by any public or private financing institution, upon such terms and conditions as may be deemed necessary, for rehabilitation of houses, farms, and private businesses; (d) conservation and land restoration measures; (e) personal services, without regard to the civil service laws; (f) hire of passenger motor vehicles and aircraft; (g) advance of funds under section 11 of the act of August 2, 1946 (31 U. S. C. 529); (h) expenses of attendance at meetings concerned with purposes of this appropriation; and (i) services as authorized by section 15 of the act of August 2, 1946 (5 U. S. C. 55a); \$400 million, to remain available until June 30, 1952: *Provided*, That prior to the payment of any indemnity, or the granting or guaranteeing of any loan under this act, the recipient thereof, or the cognizant State or local government, may be required to provide reasonable

assurance of the relocation, reconstruction, replacement, rehabilitation, or repair of the damaged property so as to provide reasonable protection against the recurrence of flood loss or damage to such property, or the indiscriminate redevelopment thereof, and for these purposes there may be acquired by purchase, donation, other means of transfer, or condemnation, and without regard to section 355 of the Revised Statutes (40 U. S. C. 255), land which is subject to recurrent flooding, and such land may be utilized or disposed of in such a manner as to reduce the likelihood of further serious flood damage: *Provided further*, That any indemnification made pursuant to the provisions of this appropriation shall be final and conclusive for all purposes: *Provided further*, That the authority conferred by this appropriation and the funds provided herein shall be supplementary to, and not in substitution for, nor in limitation of, any other authority conferred or funds provided under any other law: *Provided further*, That the functions and duties exercised under this act shall be excluded from the operation of the Administrative Procedure Act (60 Stat. 237), except as to the requirements of section 3 thereof.

## FLOOD-INSURANCE REVOLVING FUND

There is hereby created the "Flood-insurance revolving fund," which shall be available, without fiscal-year limitation, for all expenses necessary for the establishment and operation of a Federal flood-insurance program to provide insurance and reinsurance (when not otherwise available at reasonable rates and upon reasonable conditions from private sources) against damage to, or loss of, private property (including that owned by State or local governments) from floods occurring within the United States or its Territories, including expenses of attendance at meetings concerned with the purposes of said fund; services as authorized by section 15 of the act of August 2, 1946 (5 U. S. C. 55a); advance of funds under section 11 of said act of August 2, 1946 (31 U. S. C. 529); and purchase and hire of passenger motor vehicles. Said program shall be administered by such agency of the Government (including new agencies which the President is hereby authorized to create) as the President may direct, and shall be operated under such regulations as he may approve. For the foregoing purposes, there may be transferred to said fund, from the appropriation for "Rehabilitation of midwestern flood-stricken areas," such amounts as the President shall determine to be necessary, which shall remain available without regard to the limits of disaster areas. In addition, said fund shall be credited with all net receipts from insurance premiums, salvage, or other recoveries from insurance activities thereunder, and there are authorized to be appropriated such additional amounts as may be required: *Provided*, That any insurance or reinsurance issued under said fund shall be based, insofar as practicable, upon consideration of the risk involved, and said program shall utilize to the maximum extent possible the facilities of private insurance companies: *Provided further*, That reinsurance shall not be provided under said fund at rates less than, nor obtained under said fund at rates more than, the rates established by the Government on the same or similar risks or the rates charged by the insurance carrier for the insurance so reinsured, whichever is most advantageous to the Government, except that there may be made to the insurance carrier such allowances for expenses on account of the cost of services rendered or facilities furnished as may be deemed reasonably to accord with good business practice, but such allowance to the carrier shall not provide for any payment by the carrier on account of solicitation for or stimulation of insurance business: *Provided further*, That such program of insurance shall be so administered as not to serve as an inducement for indiscriminate investments in facilities in areas which are subject to recurring floods.

## APPENDIX E

MESSAGE FROM THE PRESIDENT OF THE UNITED STATES TRANSMITTING  
RECOMMENDATIONS RELATIVE TO NATIONAL FLOOD INSURANCE

*To the Congress of the United States:*

Last summer, following the great floods in Kansas, Missouri, and Oklahoma, I recommended that the Congress establish a national system of flood-disaster insurance. As I said then, the lack of such an insurance system is a major gap in the means by which a man can make his home, his farm, or his business secure against financial loss.

In order to be of help to the Congress in its further consideration of this matter, I have had draft legislation prepared embodying the views of the executive agencies concerned as to the best way to set up a sound and workable flood-insurance system. A copy of this draft legislation is attached to this message, and the agencies that prepared it, particularly the Reconstruction Finance Corporation, stand ready to give the Congress any further help they can.

The reasons for enacting such legislation are very clear. At present, insurance against flood damage is virtually unobtainable from private insurance companies, nor does it seem likely that the private companies, by themselves, will find it possible to write flood insurance at reasonable rates. The need for such insurance, however, is urgent. Homeowners, farmers, and businessmen may have their assets and their savings of years wiped out in a few hours if a disastrous flood strikes their property. We have seen it happen year after year.

To meet this situation, we can and should make available to those in potential flood areas the opportunity to protect themselves against the financial losses which such floods bring. I am sure that the great majority of the people concerned want to provide in advance out of their own resources for protection of their property against floods—just as they do now against fire and other hazards.

A Federal system of flood insurance is the logical answer. It would enable individual property owners to pool their risks and to meet a large part of their losses out of their common funds rather than forcing them to rely upon emergency relief, as is too often the case now. It would provide funds needed to restore property damage in floods, without requiring people to borrow heavily against their future incomes.

Insurance is especially important under present circumstances when our system of protection against floods is so incomplete. Flood insurance, however, has more than short-run significance. It is also necessary as part of our long-run attack on the flood problem. Dealing with floods at their source, by doing the necessary work on the land and in the stream beds to catch and hold floodwaters, will always be our major weapon for preventing flood damage. Limits also need to be placed on the use of the flood plains, through State and local zoning laws, wherever the cost of complete protection from floods would be prohibitive. But flood insurance will always be necessary to protect people against the financial losses which may be caused by unexpected and catastrophic floods which it is impossible to prevent.

The attached draft legislation would authorize the Reconstruction Finance Corporation to provide either insurance or reinsurance against losses resulting from floods. If private insurance companies wish to do so, under this bill they could write insurance against floods and could then reinsure themselves against excessive loss by paying appropriate premiums to the Reconstruction Finance Corporation. Or, alternatively, the Corporation would be authorized to issue insurance policies directly. The Corporation, of course, should not compete with private insurance companies. The draft bill would prohibit the issuance of Federal policies in cases where private insurance is available at reasonable rates. In addition, it would require the Corporation to work through private insurance companies in administering the program.

This draft bill would authorize insurance to be made available for homes, for business and farm properties, and for agricultural commodities. It would also establish a maximum amount of insurance for any one person or business of \$250,000. While this would not cover some of the large losses in a flood, it would take care of the homeowners, businessmen, and farmers who are least able to afford flood losses because their total assets are small. As experience is gained, it may be desirable to change this maximum amount.

Furthermore, the bill would limit the insurance payment on any given property to 90 percent or less of the loss sustained. Such a limitation will preserve the incentive for the property owner to do what he can to protect his own property.

I believe that this flood-insurance program should be set up on a basis that is designed to permit the Government to break even. To do so, it will be necessary that rates be set high enough to cover all expenses, including a proper reserve for losses.

However, since there is only limited experience upon which to rely in determining such rates, it will be necessary to start the program on an experimental basis, both with respect to rates and areas covered. Accordingly, the draft legislation provides for limitations on the total amount of insurance to be written in each of the first 3 years, and for a report to the Congress by the Corpora-

tion before the end of that period, making recommendations concerning the nature and extent of the program thereafter.

In addition, the draft legislation authorizes Federal agencies that make or guarantee loans to require borrowers to purchase flood insurance where it is available. Thus the Reconstruction Finance Corporation, for example, might require its borrowers to carry flood insurance, where appropriate, just as it now requires them to carry fire insurance.

All in all, I believe this draft legislation represents a sound and workable approach, and I heartily recommend it to the consideration of the Congress. I strongly believe that legislation along these lines is most urgently needed. There is no reason whatever for continuing to rely on inadequate and emergency relief programs to take care of the thousands of people every year who suffer extensive flood damage to their homes and farms and businesses.

We can and we should provide a businesslike system of insurance to finance the restoration of such losses. I hope the Congress will enact such a system without delay.

HARRY S. TRUMAN.

THE WHITE HOUSE, May 5, 1952.

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A BILL To provide for National Flood Insurance, and for other purposes

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Flood Insurance Act of 1952".*

DECLARATION OF PURPOSE

SEC. 2. It is the purpose of this Act to promote the national welfare by alleviating the widespread economic distress suffered from time to time within the United States, its Territories and possessions as a result of floods, and the attendant impairment of the free flow of interstate and foreign trade and commerce, by providing direct governmental insurance against certain flood risks or by making insurance against such risks available through private insurance companies by means of governmental reinsurance.

FUNCTIONS

SEC. 3. (a) To carry out the purposes of this Act, the Reconstruction Finance Corporation (hereinafter referred to as "the Corporation") is authorized to provide either insurance or reinsurance, or both insurance and reinsurance, against loss resulting from damage to or loss of real or personal property (including agricultural commodities, and property owned by the State or local governments) due to flood as defined by the Corporation occurring within the limits of the United States, its Territories, and possessions: *Provided, That no insurance or reinsurance shall be issued for losses resulting from (A) any hostile or warlike action by (i) any government or sovereign power (de jure or de facto) or any authority maintaining or using military, naval, or air forces, or (ii) an agent of any such government, power, or forces, or (B) any action taken by any Federal, State, or local government agency in hindering, combating, or defending against any such hostile or warlike action (whether actual, impending, or expected), or (C) disorder or other lawlessness accompanying the collapse of civil authority determined by the President to have resulted from any action referred to in clause (A) or (B) or from control by enemy forces.*

(b) The Corporation shall from time to time prescribe (1) premium rates for each type of insurance and/or reinsurance which it shall make available under authority of this Act, and (2) the terms and conditions under which and the areas and subdivisions thereof within which each rate shall be applicable. All such rates shall be based upon consideration of the risks involved and shall be adequate, in the judgment of the Corporation, to cover all administrative and operating expenses arising under this Act, as well as reserves for probable losses. The Corporation may receive from or exchange with any State or territorial insurance commission or agency or with any private corporation or association engaged in the writing of insurance against property loss within the United States such loss experience information as may be necessary for the establishment of such premium rates.

(c) The Corporation shall by regulation provide for the determination of (1) the types and location of property with respect to which insurance and/or reinsurance shall be granted, (2) the nature and limits of loss or damage in any area or subdivisions thereof which may be covered by such insurance or reinsurance, (3) rates, terms, and conditions of such insurance or reinsurance, and (4) such other matters as may be necessary to carry out the purposes of this Act. The Corporation may decline such applications and risks and may establish from time to time such regulations with respect to the classification, limitation, and rejection of risks as it shall deem advisable for the purposes of this Act.

(d) In providing insurance and/or reinsurance, the Corporation may by contract arrange for the financial participation of private insurance companies or other insurers in the underwriting of risks assumed, and for their proportionate participation in premiums and in any profits or losses realized or sustained. The Corporation shall utilize the facilities and services of other public agencies, of private insurance companies, and of established insurance agents and brokers and established insurance adjustment organizations to the maximum extent which the Corporation shall deem practicable and consistent with minimum cost of providing insurance protection.

(e) The aggregate amount of insurance issued by the Corporation in favor of any person or State or local government shall not exceed \$250,000. No claim shall be approved in an aggregate amount which exceeds the actual cash value or the cost of replacing, repairing, or rebuilding the damaged property with material of like kind and quality (less depreciation at the time of damage) whichever is lower: *Provided*, That the approved amount of any claim shall be reduced by \$300 plus 10 per centum of the remainder, or by such larger amount or percentage as may be prescribed by the Corporation in the insurance contract. The Corporation shall prescribe such regulations applicable to reinsurance as it may deem appropriate to give effect to the intent of the limitations in this subsection. The Corporation may from time to time prescribe such regulations regarding coverage available to subsidiary and affiliated corporations as it shall deem appropriate to effectuate the purpose of this subsection.

(f) The Corporation, on and after the first day of the sixth month following the enactment of this Act, may provide insurance or reinsurance in an aggregate amount not to exceed \$500,000,000 outstanding and in force at any one time, which limit may be increased, with the approval of the President, by further amounts of \$500,000,000 each on July 1, 1953, and July 1, 1954.

#### COORDINATION WITH OTHER PROGRAMS

SEC. 4. (a) In carrying out the functions authorized in this Act, the Corporation shall consult with other agencies of the Federal Government and interstate, State, and local agencies having responsibilities for flood control and flood damage prevention in order to assure that the insurance facilities offered are consistent with the programs of such agencies.

(b) No insurance or reinsurance shall be issued (1) for risks eligible for insurance provided by other Federal programs, or to the extent that coverage is available on reasonable terms from other private or public sources, or (2) for properties whose use is in conflict with State or local flood zoning laws.

(c) Any department or agency of the Federal Government engaged in making direct loans or advances, or in participating in, insuring or guaranteeing loans made by private lending institutions, for the construction, modernization, repair, or purchase of property eligible for insurance under this Act may require as a condition for such future financial assistance that such property be insured against flood damage to the extent such insurance is available.

#### FINANCING

SEC. 5. (a) To carry out the functions authorized by this Act, there is authorized to be established in the Treasury of the United States a National Flood Insurance Fund (referred to hereinafter as the "fund"). The capital of the fund shall consist of such amounts as may be advanced to it from appropriations. Such sums as may be required are authorized to be appropriated without fiscal year limitations for the purposes of the fund.

(b) Advances shall be made to the fund from the appropriations made therefor when requested by the Corporation. The Corporation shall pay into miscellaneous receipts of the Treasury at the close of each fiscal year, interest on such advances at a rate determined by the Secretary of the Treasury, taking into con-

sideration the average rate on outstanding interest-bearing marketable public debt obligations of the United States.

(c) Premiums paid to the Corporation for insurance and reinsurance under this Act, interest earned on investments of the fund, and receipts from any other operations under this Act shall be credited to the fund. The fund shall be available for the payment of liabilities under such insurance and reinsurance and for payment of all expenses of the Corporation under this Act.

(d) Whenever any capital in the fund is determined by the Corporation to be in excess of its current needs, such capital shall be credited to the appropriation from which advanced where it shall be held for future advances. After liquidation of all outstanding advances, any cash in excess of current needs may be invested or reinvested by the Corporation in interest-bearing obligations of the United States or in obligations guaranteed as to interest and principal by the United States. The proceeds from the sale or redemption of the obligations held by the Corporation pursuant to this Act shall be credited to the fund.

#### ADVISORY, CONSULTANT, AND OTHER PERSONNEL

SEC. 6. (a) The Corporation (1) shall appoint an advisory committee, consisting of not less than three individuals experienced in the writing of insurance against property loss, to advise the Corporation with respect to the execution of its functions pursuant to this Act, and (2) may also employ such part-time consultants and advisory personnel as the Corporation may deem necessary in carrying out the purposes of this Act. Persons so employed who, while so serving, hold other offices or positions under the United States shall receive no additional compensation for such service. Other persons required under the provisions of this subsection may be employed as authorized in section 15 of the Act of August 2, 1946 (5 U. S. C. 55a), but at rates for individuals not in excess of \$50 per diem.

(b) In order to carry out the purposes of this Act, the Corporation is hereby authorized, subject to the procedures prescribed by section 505 of the Classification Act of 1949, to place not more than five positions in grade 16, 17, or 18 of the general schedule established by said Act, and such positions shall be in addition to the number authorized by said section.

#### PAYMENT OF CLAIMS

SEC. 7. (a) Under such regulations as the Corporation may prescribe, it shall adjust and pay valid claims either directly or through agents for losses covered by insurance and reinsurance under this Act. The Corporation shall collect from participating insurance companies such amounts as they may be obligated to contribute toward such losses.

(b) Upon disallowance of any claim against the Corporation or upon refusal of a claimant to accept the amount allowed by the Corporation, the claimant, within one year after the date of mailing notice of disallowance or partial disallowance by the Corporation, may institute an action against the Corporation on such claim in the United States district court for any district in which the insured property or a part thereof is situated. Exclusive jurisdiction is hereby conferred upon such courts, sitting without juries, to hear and determine such actions without regard to the amount in controversy.

#### REPORTS

SEC. 8. (a) The Corporation shall make a comprehensive annual report of its operations under this Act for the fiscal year ending on the preceding June 30 to the Congress as soon as practicable in each year, but in no case later than the third day of the following January.

(b) The Corporation shall make a study and investigation of (1) the work, activities, personnel, and functions authorized under this Act, for the period from the enactment of the Act to June 30, 1954, and (2) the practicability of providing insurance or reinsurance for loss resulting from business interruption due to floods. It shall report to the Congress the result of the study and investigation, and make such recommendations as it may deem appropriate, on or before January 3, 1955.

## SUCCESSION

SEC. 9. The powers, functions, duties, and authority arising under this Act shall be exercised and performed by the Reconstruction Finance Corporation while that Corporation has succession, and thereafter by such officer, agency, or instrumentality of the United States as the President may designate: *Provided*, That for the purposes of carrying out this Act by any such officer, agency, or instrumentality the authority granted to the Reconstruction Finance Corporation in section 3 of the Act of January 22, 1932, as amended (15 U. S. C. 603), shall be available to such officer, agency, or instrumentality, notwithstanding dissolution of the Reconstruction Finance Corporation.

## XI. PROPOSED LEGISLATION

Four specific bills dealing with Federal disaster insurance have been drafted for consideration by the committee.

### THE LEHMAN BILL

By far the most comprehensive in scope and detail of the four, this bill authorizes insurance and reinsurance for several types of natural and manmade disaster and would strengthen the statutory authority of the Federal Civil Defense Administration to handle disaster relief insurance and reinsurance. In recognition of the broader scope to be covered by the Federal Civil Defense Administration, the bill changes its title to Federal Disaster Administration.

#### *Title I—Natural Disaster*

Insurance and reinsurance could apply to damage from flood, tidal wave, hurricane, tornado, blizzard, duststorm, hailstorm or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination or other air pollution, or volcanic eruption.

Coverage is authorized for both real and personal property, either privately owned or owned by State or local governments. It is limited to property located in the United States, its Territories or possessions. Variable premium rate schedules are to be based upon consideration of the risks involved and shall be as nearly adequate as practicable to make the program self-supporting, consistent with the aim of achieving rate schedules reasonable enough to encourage insurance purchase. Risks impractical to cover may be excluded. No property used inconsistently with flood zoning laws shall be covered. A \$300,000 limit per person or government is set on Federal insurance against natural disaster. Each policy must contain a \$200 loss deductible provision. Terms and conditions of reinsured policies must meet the Federal Disaster Administrator's approval. Insurance may be offered on a community basis. Reinsurance plans may include a Federal catastrophe excess loss reinsurance fund to cover an insurer's excess losses on a portfolio basis in any single catastrophe.

The total outstanding liability of the Administrator under natural disaster insurance or reinsurance shall not exceed \$2 billion. Appropriate funds for operations and reserves are authorized, to be fed by premiums, investment income, salvage, and Treasury borrowings up to \$1 billion by the Administrator (or such larger amount as the President may approve). Claims paid shall not exceed the lower of actual value or replacement cost minus depreciation. Court review is authorized for unsatisfactory claim adjustments. No insurance or reinsurance can cover perils for which insurance is reasonably available from public or private sources, except that a blanket natural dis-

aster policy may be offered under the bill. Facilities of private organizations are to be used to the maximum extent practicable. They may contract to share underwriting risks, sharing profits or losses.

Federally aided property may be required to carry natural disaster insurance.

### *Title II—Manmade Disaster*

Insurance or reinsurance is authorized for war damage (as defined) to real and personal property and persons. Coverage may include damage to realty or personalty, workmen's compensation liability, injury or death of civil-defense workers and those performing like duties with official sanction, and injury, disease, or death of persons generally. General exceptions as to classes of persons or property are authorized. Civil-defense workers and those in similar status receive indemnity without paying premiums. Other coverage requires premiums based on the average risk for each class. Rates are uniform for (1) each type of property, (2) workmen's compensation liability, and (3) legal residence for personal insurance. Coverage applies only to property in or touching United States territory or in transit from one point to another therein and to persons in United States territory. Indemnity offered varies with property value, its importance to national security, and State workmen's compensation or occupational disease laws. It is limited to 75 percent of the declared value of property. It may be paid in stages of 10 percent within 2 months after claim approval and the balance within 14 months after such approval, if advisable in the interest of Federal credit or stability. No other limits are placed on coverage under an individual policy but aggregate exposure to liability for property insured can't exceed \$10 billion. Federally aided property may be required to carry war-damage insurance. No overall limit applies to personal injury, disease, or death; this is governed by State law limits per person. Appropriate funds for operations and reserves are authorized, fed by premiums, investment proceeds, salvage, and Treasury borrowings up to \$10 billion (or more with Presidential approval). No indemnity, insurance, or reinsurance applies to risks eligible for other Federal insurance or to the extent coverage is reasonably available from other public or private sources. The facilities of private organizations are to be used to the maximum extent practicable. Court review is authorized for unsatisfactory claim adjustment.

### *Title III—General Provisions*

A 3- to 15-man advisory committee is required, composed of persons familiar with indemnity, insurance or reinsurance problems. Housekeeping provisions are included. Statutory authority is given the Federal Civil Defense Administration (renamed the Federal Disaster Administration) to handle natural disaster relief. State responsibility for disaster relief is broadened by requiring (1) maintenance of a \$100,000 disaster relief fund in each State or a State agreement to set off up to \$100,000 disaster relief against other Federal moneys coming due to the State, and (2) State assurance of maximum use of State and local personnel and facilities with agreement to shift their control during an emergency to Federal authorities upon request. The Administrator is authorized to federalize

public relief personnel (except as to employment status), much as the National Guard can be called into Federal service. Annual reports to the Congress are required.

#### THE KENNEDY-SALTONSTALL BILL

Except for the fact that it authorizes insurance as well as reinsurance, this bill is the most limited in scope of the four contained herein. It is offered as a small experimental program to test the feasibility of Federal flood insurance and reinsurance for homeowners and businessmen. The Small Business Administration would be authorized to insure or reinsure privately owned real property (commercial, industrial, and residential) against flood loss in the United States, its Territories and possessions. Personal property would not be covered. General exclusions are authorized, as well as limits of coverage by areas. Premium rates would be uniform by type of insurance or reinsurance and type or class of property covered. Rates are to be based on consideration of risks and to the extent practicable shall be adequate to cover operations and reserves. A limit of \$250,000 is set for a policy on any single piece of realty. Subsidiary and affiliated corporations are subject to regulation as to obtaining insurance. No claim paid shall exceed the lower of actual cash value or replacement cost minus depreciation. Each policy shall contain a loss deductible provision of \$300 plus 10 percent of the remainder of the claim, as a minimum. SBA may regulate reinsurance terms. Total exposure to risk is limited to one-half billion dollars (plus one-half billion dollars additional on each July 1 in 1957 and 1958 with Presidential approval). A national flood insurance fund is authorized in the Treasury to cover operations and reserves to be fed by premiums, salvage, and other receipts, and appropriations authorized by the bill without fiscal year limitations. Actual advances from appropriations shall be made upon SBA request, and interest on advances shall be charged at the average rate on United States obligations. Excess capital may be repaid to appropriations. Private insurance companies may contract to share underwriting risks and participate in profits or losses. The program shall be handled so as not to induce unwarranted acquisition of facilities in recurrently flooded areas. SBA shall consult with Federal, State, and local flood control agencies to make insurance program consistent with their programs. SBA shan't offer insurance or reinsurance for property used in conflict with flood zoning laws. Federally aided property may be required to carry flood insurance. An advisory committee of six or more persons experienced in writing property insurance is required. No insurance or reinsurance is to be issued for risks eligible for other Federal insurance or to the extent coverage is reasonably available from public or private sources. Facilities and services of private insurance companies shall be used to the fullest extent possible, consistent with minimum-cost insurance.

#### THE CARLSON BILL

This bill authorizes only reinsurance on real or personal property owned privately or by State or local governments. Coverage includes damage by flood, tidal wave, earthquake, or hurricane in the United

States or its Territories. The bill creates a National Disaster Insurance Corporation with a bipartisan three-man Board of Directors appointed by the President subject to Senate confirmation. The President designates one director as Chairman. Capital stock of \$50 million is authorized, a like amount being authorized to be appropriated to the Secretary of the Treasury to subscribe to such stock. Usual powers of a Government corporation are granted to NDIC. It is made subject to the Government Corporation Control Act. Reinsurance premium rates are to be based upon consideration of risks and the desirability in the public interest of providing insurance otherwise unavailable. From private insurance organizations the Corporation may obtain loss-experience information necessary to establish premium rates on a sound actuarial basis and on the lowest practicable level. The Corporation regulates types of property covered, nature and limits of reinsured losses, and other matters necessary. No statutory limit is provided for policies reinsured or for total exposure to risk. Court review is authorized for unsatisfactory claim adjustments. A national disaster insurance fund is created as a permanent trust fund in the Treasury, fed by premiums and interest earnings. Portions of the fund may be set aside as reserves. Administrative expenses are to be paid from appropriations authorized, not from the fund. An annual report to the Congress is required. Reinsurance is to be offered only to the extent not otherwise reasonably available from private sources. Facilities and services of private insurance companies shall be used to the maximum extent practicable.

#### THE STAFF BILL

The staff bill was drafted at the request of Senator Bush. This bill is as broad in perils covered as the Lehman bill, but is not as detailed. It covers flood, tidal wave, hurricane, tornado, blizzard, duststorm, hailstorm or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination or other air pollution, and volcanic eruption; as well as war damage, upon a Presidential finding that such coverage is necessary in the public interest. The bill authorizes administration of the program by the Small Business Administrator, or such other existing Government officer or agency as the President may designate. It authorizes indemnity (rather than insurance) and reinsurance against damage to real and personal property owned privately or by State or local governments, occurring within the United States or its Territories or possessions. Fees and reinsurance premium rates are to be based on consideration of the risks, the desirability in the public interest of providing protection and the aim of providing from premiums, investment income and salvage a sum sufficient to pay operating expenses and maintain reserves. Types of property covered, nature and limits of losses, and other necessary matters are left to regulation. Limits under a single agreement or policy are set at \$60,000 for a 1- to 4-family house and \$250,000 on a property in a single area. Total outstanding liability under this bill is limited to \$2 billion. The bill authorizes the Federal Government to reinsure 100 percent of each loss up to \$1,000 and over \$50,000 and as much as 80 percent of the portion of each loss from \$1,000 to \$50,000, in an effort to limit the federally uninsurable exposure of the insurer to a maximum of

\$39,200 per policy, in the hope that this would enable the insurer to set a low actuarial premium rate on this limited exposure. This, added to the rate charged by the Federal Government for reinsurance (which need not be based solely on actuarial principles), would tend to lower the insurance premium required from the policyholder below that required on true actuarial principles. Any policy reinsured under this bill would be subject to Federal approval. A loss deductible provision could thus be required. Court review is authorized for unsatisfactory claim adjustments. A disaster indemnity fund and a disaster reinsurance reserve fund are created for operations and reserves, to be fed by fees and premiums, investment income, salvage, and Treasury borrowings up to \$1 billion (or more if approved by the President). No indemnity or reinsurance is to be provided for risks eligible for other Federal insurance or to the extent coverage is reasonably available from public or private sources. Nor is protection to be offered for property used in conflict with flood or disaster zoning laws. Services of private insurance companies are to be used to the maximum extent practicable. Free indemnity up to half their unreimbursed proven property loss in major disasters during the current fiscal year is authorized for victims of major disasters. Payments may be made from the disaster indemnity fund.

War damage (as defined) coverage by insurance or reinsurance may be triggered by a Presidential finding that it is necessary in the public interest. Terms and conditions of such reasonable protection against damage to real and personal property and against personal injury or death and the amount charged for it are left to administrative discretion. Total exposure to liability outstanding is limited to \$10 billion. A war damage fund is authorized to be established by transfer of \$100 million as a non-interest-bearing loan from the disaster indemnity fund. The fund may be fed by charges, investment income, salvage, and Treasury borrowings within the natural disaster borrowing limits of \$1 billion, or higher amount approved by the President.

An advisory committee of 3 to 25 persons familiar with indemnity, insurance or reinsurance problems is required. Annual reports to the Congress are to be made.

## APPENDIX A

## A COMPARATIVE ANALYSIS OF 4 FLOOD AND DISASTER INSURANCE BILLS UNDER CONSIDERATION BY THE SENATE COMMITTEE ON BANKING AND CURRENCY

	Lehman	Kennedy-Saltonstall	Carlson	Staff
Administration.....	Federal Disaster Administrator.....	Administrator of the Small Business Administration.	National Disaster Insurance Corporation.	Administrator of the Small Business Administration.
Types of risks covered....	Natural—flood, tidal wave, hurricane, tornado, blizzard, dust-storm, hailstorm, or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination, or other air pollution or volcanic eruption. War damage and perils of war— (a) hostile or warlike action by government power or authority, using military force, or agent of foregoing; (b) action by Government agency of United States to defend against hostile or warlike action. (c) Disorder accompanying collapse of civil authority resulting from (a) or (b) or enemy control.	Any flood as defined by the Administration.	Flood, tidal wave, earthquake, or hurricane.	Natural disaster—flood, tidal wave, hurricane, tornado, blizzard, dust-storm, hailstorm, or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination, or other air pollution or volcanic eruption. War damage—(a) from hostile or warlike action by government or authority using armed force or their agents; (b) from defensive action against such action by Government; (c) from disorder accompanying collapse of civil authority determined by President to have resulted from (a) or (b) or control by enemy forces.
Individual limitations of coverage.	Natural disaster—Property: \$300,000 with \$200 deductible; \$300,000 per inhabitant on community coverage. War risk—Limited to 75 percent of declared value of property. Reasonable compensation for workmen's compensation liability. Reasonable compensation for personal injury or death of civil-defense worker or one performing civil-defense duties. Reasonable compensation for personal injury, disease, or death from war perils.	Aggregate amount insurance to any single piece of real property not to exceed \$250,000. Approved amount of any claim reduced by \$300 plus 10 percent of remainder or by such larger amount or percentage as may be prescribed by the Administrator.	Corporation shall provide by regulation limits of loss which may be covered.	\$50,000 limit on 1-4 family residence, \$250,000 limit on other property under any one policy. On reinsurance assume first \$1,000 and all exceeding \$50,000 per policy and up to 80 percent of loss between those limits—natural disaster. War risk—reasonable protection to real and personal property and against personal injury or death.

Rates.....	<p>Natural—Prescribed by Administrator for each type insurance or reinsurance available. Administrator prescribes areas and subdivisions within which each rate shall be applicable. On policies reinsured, subject to approval of Administrator.</p> <p>War risk—Established by Administrator on basis (1) type property; (2) protection offered; (3) legal residence of person involved.</p>	Prescribed by Administrator for each type insurance, and/or reinsurance available and for each type or class of property insured. Administrator also prescribes areas and subdivisions within which each rate shall be applicable.	Depends upon risks involved and the desirability in the public interest of providing protection which would not be otherwise available.	President or his designee shall prescribe fees and premium rates for indemnity and reinsurance on basis: risk insured, desirability of providing the indemnity, and expense of operating insurance plan including reserves.
Operation and role of insurance companies.	On agreement, can sell direct Federal insurance and recommend adjustment of claims. Can reinsure private insurance companies either by policy or portfolio.	On agreement, can sell direct Federal insurance and recommend adjustment of claims and can reinsure private insurance companies.	Can only reinsure private companies.	On agreement, can sell direct Federal indemnity agreements and recommend adjustment of claims. Can reinsure private companies.
Borrowing limits.....	<p>Natural—\$1 billion.</p> <p>War risk—\$10 billion.</p> <p>Both can be increased with President's approval.</p>	National flood insurance fund established. Capital shall consist of such amounts as may be advanced to it from appropriations. Such sums as may be required are authorized without fiscal year limitations for the purposes of the fund.	National disaster insurance fund established. Premiums deposited therein and are available for payment of claims.	Not exceeding \$1 billion or such greater amount as may be approved by the President.
Claim limit.....	<p>Natural—\$2 billion.</p> <p>War risk—\$10 billion, for property.</p> <p>No limit on personal injury.</p>	Not exceeding \$500 million may be increased by further amounts of \$500 million each in 1957 and 1958.	No limitation.....	Not exceeding \$2 billion—natural; \$10 billion—war risk.
Rate making.....	<p>Natural—</p> <p>Property: Administrator shall, from time to time, prescribe (1) premium rates for each type of insurance and reinsurance he shall make available and (2) terms and conditions upon which and areas within which (including subdivisions thereof) each rate shall apply. Such rates shall be based upon consideration of the risks involved and, in the judgment of the Administrator, shall be as nearly adequate as practicable to meet expenses and set up reserves for losses consistent with the aim of offering insurance and reinsurance at rates reasonable enough to encourage prospective insureds or ceding companies to purchase insurance or reinsurance. May receive from or exchange with insurance organizations and Government agencies information useful in administering programs.</p>	Administrator shall, from time to time prescribe (1) uniform premium rates for each type of insurance and/or reinsurance available for each type or class of property to be insured and (2) the terms and conditions under which and the areas and subdivisions thereof within which each rate shall be applicable. All such rates shall be based, insofar as practicable, upon consideration of the risks involved and shall, to the extent deemed practicable, be adequate to cover expenses as well as reserves for probable losses. Administrator may receive from or exchange with insurance associations or regulatory authorities such loss experience and other information as may be necessary for the establishment of such premium rates.	Corporation shall prescribe premium rates for reinsurance upon consideration of (1) the risks involved and (2) the desirability in the public interest of providing insurance protection which would not otherwise be available. Corporation may receive from or exchange with insurance organizations or regulatory authorities such loss experience information as may be necessary to establish rates upon a sound actuarial basis and upon the lowest practicable level. Administrative expenses do not figure in the computation of the rates.	President or his designee shall, from time to time, prescribe fees and premium rates for indemnity and reinsurance authorized. Consideration shall be given to the risks insured against and the desirability in the public interest of providing indemnity or insurance with the aim of achieving a self-supporting program. May receive from or exchange with insurance organizations or regulatory authorities such information as may be useful in establishment of indemnity fees and reinsurance rates and administration of programs.

## APPENDIX A—Continued

A COMPARATIVE ANALYSIS OF 4 FLOOD AND DISASTER INSURANCE BILLS UNDER CONSIDERATION BY THE SENATE COMMITTEE  
ON BANKING AND CURRENCY—continued

	Lehman	Kennedy-Saltanstill	Carlson	Staff
Rate making—Continued	<p><b>Community insurance:</b> This property insurance is available to any public body for the benefit of its inhabitants and the Administrator is to satisfy himself of public body's authority to buy the insurance and pay premium from taxation or otherwise. Premium fixed by Administrator, taking into consideration the nature of the risk insured against, the number of beneficiaries, the possible total liability and the aim of making the program self-supporting.</p> <p><b>Excess loss reinsurance:</b> Reinsurance on a portfolio basis covering excess losses of ceding companies for any single catastrophe. Fee to be adequate to make program self-supporting.</p> <p><b>War risk—</b>Administrator shall, from time to time, establish uniform rates (1) for each type of property covered, (2) for workmen's compensation coverage, and (3) for personal injury, disease or death, according to legal residence of person covered.</p> <p><b>In order to establish a rating basis,</b> the Administrator shall estimate, from time to time, the average risk involved in each class of coverage afforded.</p>	<p>None. ....</p> <p>No express provision. Impliedly left to administrative discretion.</p>	<p>None. ....</p> <p>No express provision. Impliedly left to administrative discretion.</p>	<p>None.</p> <p>No express provision. Impliedly left to administrative discretion.</p>

## APPENDIX B

## PROVISIONS AND SECTIONAL ANALYSIS OF THE LEHMAN BILL

[Committee print, October 25, 1955]

[Intended to be proposed by Mr. Lehman]

A BILL To provide insurance against natural and manmade disasters, and for other purposes

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the Disaster Insurance Act of 1956.*

## DECLARATION OF PURPOSE

SEC. 2. From time immemorial man has been afflicted with disaster by the forces of nature. Throughout recorded history man has also been the victim of manmade disasters. As a result of a single natural or manmade disaster, all a man's possessions, savings, and business assets may vanish, leaving him with naught in his misery but his unpaid debts.

With the development of civilization, man has sought to lessen the impact of disaster on an individual. Toward this end he has adopted protective measures to minimize physical damage caused by disasters. He has also banded together with his fellow men to spread the unavoidable risks of many disasters through use of insurance. By this means comparatively small advance contributions from many subject to peril create a reserve available to pay the large losses of a relatively few who suffer damage from that peril at a given time.

In this Nation, the protective device of insurance has not yet extended to certain forms of natural or manmade disaster. These visitations do not respect the boundaries of State or local political subdivisions. Being national in character, it behooves the Federal Government to provide a means of alleviating their ill effects.

It is the purpose of this Act to authorize a program of Federal insurance against the risks of loss resulting from the natural and manmade disasters hereinafter defined, to the extent such insurance is not available on reasonable terms and conditions from other public or private sources. It is a further purpose of this Act to place the administration of such an insurance program in the custody of a single Federal agency endowed with ample power to execute the responsibilities vested in it by the provisions of this Act. It is the intent of the Congress that the programs authorized by this Act be administered effectively and in a humanitarian spirit in order to contribute to domestic tranquility, the common defense, and the general welfare of the people of the United States, and to enable the better conduct of commerce among the several States and with foreign nations.

## TITLE I—NATURAL DISASTER INSURANCE AND REINSURANCE

SEC. 101. To aid in carrying out the purposes of this Act, the Federal Disaster Administrator (hereinafter called the "Administrator") is authorized to provide insurance or reinsurance, or both, against loss resulting from damage to or destruction of real or personal property (including property owned by State or local governments) due to natural disaster, as hereinafter defined, occurring within the United States, its Territories, or its possessions.

SEC. 102. The Administrator shall from time to time prescribe (1) premium rates for each type of insurance and reinsurance he shall make available under authority of this title, and (2) terms and conditions upon which and areas (including subdivisions thereof) within which each rate shall apply. Such rates shall be based upon consideration of the risks involved, and, in the judgment of the Administrator, shall be as nearly adequate as practicable to provide sufficient funds to meet administrative and operating expenses under this Act and reserves for anticipated losses, consistent with the aim of offering insurance and reinsurance at rates reasonable enough to encourage prospective insureds or ceding companies to purchase such insurance or reinsurance respectively.

SEC. 103. The Administrator is authorized to provide for the determination of types and location of property with respect to which insurance or reinsurance shall be made available, the nature and limits of loss or damage in any area (including subdivisions thereof) which may be covered by such insurance or rein-

surance, and such other matters as may be necessary to carry out the purposes of this Act.

Sec. 104. The Administrator may exclude from the operation of the insurance or reinsurance programs authorized by this title such risks as he deems impracticable to cover, in individual cases or as a class; and the Administrator may from time to time establish appropriate regulations regarding the classification and limitation of risks assumed by him under authority of this Act.

Sec. 105. (a) The aggregate amount of insurance issued by the Administrator to any one person or State or local government shall not exceed \$300,000. No claim for loss shall be approved which exceeds the lesser of (1) the actual value at time of loss or (2) the cost of replacing, repairing, or rehabilitating the property destroyed or damaged with material of like kind and quality (less depreciation at time of loss). The insurance issued by the Administrator shall contain a loss deductible clause excusing the Administrator from paying the first \$200 of a claim for loss approved by him.

(b) The liability of the Administrator under insurance or reinsurance provided under this title shall not exceed \$2,000,000,000, at any one time.

Sec. 106. The Administrator is authorized to make available to any public body for the benefit of its inhabitants insurance under the provisions of this title. Any provision of this title to the contrary notwithstanding, such insurance may be issued upon payment of a premium fixed by the Administrator, taking into consideration the nature of the risks insured against, the number of beneficiaries, the possible total liability of the Administrator under the policy (which shall not exceed \$300,000 per inhabitant), and the aim of making self-supporting any program undertaken under the provisions of this section. Prior to the issuance of each insurance policy under the provisions of this section, the Administrator shall satisfy himself that applicable law authorizes the public body involved to purchase such policy and pay the premium therefor, obtaining the funds required for that purpose by taxation or otherwise pursuant to applicable law.

Sec. 107. (a) The Administrator is authorized to issue such regulations regarding reinsurance under this title as he deems advisable in order to carry out the purposes of this title.

(b) The premium rate and terms and conditions of any policy reinsured under the provisions of this title shall be subject to approval by the Administrator.

(c) In addition to powers elsewhere granted to him in this title, the Administrator may make available a reinsurance program providing for creation of a Catastrophe Excess Loss Reinsurance Fund as hereinafter provided, which shall be available to pay excess loss reinsurance claims submitted on a portfolio basis by the insurer arising out of a single catastrophe, in consideration of payment by the insurer of a fee deemed adequate by the Administrator to make this particular reinsurance program self-supporting.

Sec. 108. (a) No insurance or reinsurance shall be issued under the provisions of this title (1) covering perils against which insurance is available on reasonable terms from other public or private sources; *Provided, however,* That insurance may be made available hereunder covering in a single policy all natural disasters as hereinafter defined.

(b) No insurance or reinsurance shall be issued under the provisions of this title on any property used in a manner inconsistent with the requirements of State or local flood zoning laws.

Sec. 109. (a) In providing insurance or reinsurance under this title, the Administrator shall use to the maximum practicable extent the facilities and services of private organizations and persons authorized to engage in the insurance business under the laws of any State or District, Territory or possession of the United States (including insurance companies, agents, brokers, and adjustment organizations); and the Administrator may arrange for payment of a reasonable compensation for such services.

(b) The Administrator is authorized to enter into agreements for financial participation of private insurance companies in the underwriting of risks assumed, and for their proportionate participation in premiums received and profits or losses realized or sustained.

(c) In providing insurance or reinsurance under this title, the Administrator may use the services of other public agencies, and pay reasonable compensation therefor.

(d) The Administrator may receive from and exchange with other agencies of the Federal Government, with State, Territorial, district, local and interstate commissions or agencies, and with private organizations experienced in

the fields of insurance or reinsurance, such information as may be useful in the administration of the programs authorized by this title.

Sec. 110. Any department or agency of the Federal Government engaged in making direct loans or advances, or in participating in, insuring or guaranteeing loans made by private lending institutions for construction, modernization, repair, rehabilitation, or purchase of property eligible for assistance under this title, may require as a condition for such future financial assistance that such property be insured against perils of natural disaster to the extent such insurance is available.

Sec. 111. (a) Under such regulations as the Administrator may prescribe, he shall arrange for prompt adjustment and payment of valid claims for losses covered by insurance or reinsurance under this title. He shall collect from participating insurance companies such amounts as they are obligated to contribute toward such losses under agreements entered into pursuant to the provisions of section 109 (b) of this title.

(b) Upon disallowance of any claim against the Administrator under color of any insurance or reinsurance made available under this title, or upon refusal of the claimant to accept the amount allowed upon any such claim, the claimant may institute an action against the Administrator on such claim in the United States district court in which a major portion (in terms of value) of the insured property is located. Any such action must be begun within one year after the date upon which the Administrator mails to the claimant notice of disallowance of the claim or within one year after the date upon which the claimant mails to the Administrator notice of refusal to accept the amount allowed by the Administrator, as the case may be. For the purposes of this section, the Administrator may be sued and he shall appoint one or more agents within the jurisdiction of each United States district court upon whom service of process can be made in any action instituted under this section. Exclusive jurisdiction is hereby conferred upon all United States district courts to hear and determine such actions without regard to the amount in controversy.

Sec. 112. (a) To carry out the purposes of this title, the Administrator is authorized to establish three funds to be known as the (1) Disaster Insurance Fund, (2) Disaster Reinsurance Reserve Fund, and (3) Catastrophe Excess Loss Reinsurance Fund, respectively.

(b) Into the Disaster Insurance Fund shall be deposited all insurance premiums collected by the Administrator for insurance issued by him under this title. Into the Disaster Reinsurance Reserve Fund shall be deposited all fees collected by the Administrator in connection with reinsurance made available by him under this title: *Provided, however,* That into the Catastrophe Excess Loss Reinsurance Fund shall be deposited all fees collected in connection with the reinsurance program authorized under the provisions of section 107 (c) of this title.

(c) Moneys in each of the funds may be invested in obligations of the United States or in obligations guaranteed as to principal and interest by the United States. Such obligations may be sold and the proceeds derived therefrom may be reinvested as above provided if deemed advisable by the Administrator. Income from such investment or reinvestment shall be deposited in the respective fund from which the investment was made.

(d) All salvage proceeds realized by the Administrator in connection with insurance made available under this title shall be deposited in the Disaster Insurance Fund; and all salvage proceeds realized by the Administrator in connection with reinsurance made available under this title shall be deposited in the Disaster Reinsurance Reserve Fund: *Provided, however,* That any salvage realized by the Administrator in connection with the reinsurance program authorized under the provisions of section 107 (c) of this title shall be deposited in the Catastrophe Excess Loss Reinsurance Fund.

(e) The Administrator is authorized to issue to the Secretary of the Treasury from time to time and have outstanding at any one time, in an amount not exceeding \$1,000,000,000 (or such greater amount as may be approved by the President) notes or other obligations in such forms and denominations, bearing such maturities, and subject to such terms and conditions as may be prescribed by the Administrator, with the approval of the Secretary of the Treasury. Such notes or other obligations shall bear interest at a rate determined by the Secretary of the Treasury, taking into consideration the current average rate on outstanding marketable obligations of the United States of comparable maturities as of the last day of the month preceding the issuance of such notes or other obligations. The Secretary of the Treasury is authorized and directed to purchase any notes and other obligations to be issued hereunder and for such purpose he

is authorized to use as a public debt transaction the proceeds from the sale of any securities issued under the Second Liberty Bond Act, as amended, and the purposes for which securities may be issued under such Act, as amended, are extended to include any purchases of such notes and obligations. The Secretary of the Treasury may at any time sell any of the notes or other obligations acquired by him under this section. All redemptions, purchases, and sales by the Secretary of the Treasury of such notes or other obligations shall be treated as public debt transactions of the United States. Funds borrowed under this section shall be deposited, in such proportions as the Administrator deems advisable, in the Disaster Insurance Fund, the Disaster Reinsurance Reserve Fund, and the Catastrophe Excess Loss Reinsurance Fund.

(f) Moneys in the Disaster Insurance Fund, the Disaster Reinsurance Reserve Fund, and the Catastrophe Excess Loss Reinsurance Fund may be used for the following purposes as deemed necessary by the Administrator:

(1) to enable the Administrator to carry out all functions under this title, including the payment of operating and administrative expenses;

(2) to pay from the Disaster Insurance Fund approved claims for loss under insurance coverage issued by the Administrator under this title;

(3) to pay from the Disaster Reinsurance Reserve Fund approved claims under reinsurance agreements entered into by the Administrator under this title: *Provided, however,* That approved claims under reinsurance agreements entered into pursuant to section 107 (c) of this title shall be paid from the Catastrophe Excess Loss Reinsurance Fund; and

(4) to repay to the Secretary of the Treasury sums borrowed from him in accordance with the provisions of subsection (e) of this section.

SEC. 113. As used in this title the term "natural disaster" shall mean any flood, tidal wave, hurricane, tornado, blizzard, duststorm, hailstorm or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination or other air pollution, or volcanic eruption.

## TITLE II—MAN-MADE DISASTER INSURANCE AND REINSURANCE

SEC. 201. (a) To aid in carrying out the purposes of this Act, the Administrator is authorized to provide reasonable indemnity for war damage consisting of loss of or damage to real and personal property or loss of life or injury to or disease of persons.

(b) The Administrator may provide such indemnity by means of insurance, reinsurance, or otherwise affording—

(1) reasonable protection against loss of or damage to real or personal property;

(2) reasonable protection against such liability as may exist under any workmen's compensation act enacted by any State, District, Territory, or possession of the United States or by the Federal government or occupational disease act, or by way of employer's liability under any such act or the common law for injury, disease or death suffered by an employee and arising out of or in the course of employment;

(3) reasonable compensation for personal injury or death suffered by any civil defense worker in the performance of civil defense activities under appropriate orders;

(4) reasonable compensation for personal injury or death and loss of or damage to real or personal property incurred in the course of performing duties of a civil defense nature pursuant to the direction of the Administrator or State, District, Territorial, or local civil defense authorities, or anyone operating under his or their direction; and

(5) reasonable compensation for personal injury, disease or death caused by the perils of war.

(c) From such indemnity the Administrator may make such general exceptions with respect to classes of property or persons as he, with the approval of the President, may deem advisable.

SEC. 202. (a) Such indemnity shall be made available upon the payment of such premium or other charge, and subject to such terms and conditions as the Administrator may establish: *Provided, however,* That in consideration of the service being rendered to the Nation by those performing duties of a civil defense nature, no contract of insurance or payment of premium or other charge shall be required of those entitled to reasonable compensation pursuant to the provisions of paragraphs (3) or (4) of subsection (b) of section 201 in this title, such compensation being payable upon a showing satisfactory to the Administrator that the person

on whose account the compensation is claimed to be due in fact suffered injury, disease, or death in the course of performing duties of a civil defense nature under the conditions set forth in either of said paragraphs.

(b) In fixing premiums or charges for indemnity made available under this title, the Administrator shall from time to time establish uniform rates (1) for each type of property with respect to which indemnity is made available pursuant to the provisions of this title, (2) for such protection as is offered against liability set forth in paragraph (2) of subsection (b) of section 201 in this title, and (3) classified according to the legal residence of the person involved, for compensation offered pursuant to the provisions of paragraph (5) of subsection (b) of section 201 in this title.

(c) In order to establish a basis for such rates, the Administrator shall estimate from time to time the average risk involved in each class of coverage offered under this title.

SEC. 203. (a) Indemnity under this title shall be made available only with relation to (1) real or personal property situated in, or persons present in a State in the United States or a District, Territory, or possession of the United States; (2) to personal property in transit between any points located in any of the foregoing; and (3) to transportation facilities touching any point located in any of the foregoing, at the time of occurrence of war damage giving rise to a claim for indemnity under the provisions of this title involving any such property or person.

(b) The Administrator, with the approval of the President, may suspend, restrict, or otherwise limit protection authorized to be made available under this title, in any area to the extent determined necessary or advisable in consideration of the loss of control of such area by the United States to such a degree as to make it impossible or impracticable to provide such protection in such area.

SEC. 204. In determining the reasonableness of protection or compensation made available under the provisions of this title, the Administrator shall take into consideration the value of the property involved, the relative importance to the national security of its replacement or repair, and the scale of benefits to which persons incurring injury, disease or death under circumstances giving rise to an approved claim under this title, would be entitled if such claim were to be processed under workmen's compensation or occupational disease law applicable to the jurisdiction in which they were present at the time of suffering injury, disease or death giving rise to such claim: *Provided, however,* That for this purpose the applicable Federal law shall not be used unless no pertinent State, District, or Territorial law is applicable in such jurisdiction.

SEC. 205. (a) In no event shall the Administrator incur an aggregate liability under this title exceeding \$10,000,000,000 in the case of property.

(b) In no event shall the Administrator be liable to pay on an approved claim more than 75 per centum of the declared value of property at the time it is insured or reinsured under the provisions of this title.

(c) Each insurance policy or reinsurance or indemnity agreement entered into under this title shall contain appropriate provisions reserving to the Administrator the right to make payment of approved claims to the extent of 10 per centum of the amount approved within two months after approval of the claim and the balance at any time or times within fourteen months after the date of such approval, upon a finding by the Administrator that such action is advisable to safeguard the Federal credit or the stability of the national economy.

(d) Except as provided in the preceding subsection (c), the Administrator shall arrange for prompt payment of all claims approved in connection with any indemnity made available under this title.

SEC. 206. (a) To carry out the functions authorized by this title, the Administrator shall establish (1) a Property Indemnity Fund, (2) a Workmen's Compensation Reserve Fund, (3) a Civil Defense Indemnity Fund, and (4) a Personal Risk Fund. In the event reinsurance is made available for any of the purposes set forth in paragraphs (1), (2), or (5) of subsection (b) of section 201 in this title, the Administrator shall also establish (1) a Property Indemnity Reinsurance Fund, (2) a Workmen's Compensation Reinsurance Reserve Fund, and (3) a Personal Risk Reinsurance Fund, as the case may be.

(b) All premiums or fees collected for insurance or reinsurance provided under this title shall be deposited in the appropriate fund of the foregoing funds, according to the type of insurance or reinsurance provided.

(c) Moneys in such funds may be invested in obligations of the United States or in obligations guaranteed as to principal and interest by the United States.

Such obligations may be sold and the proceeds reinvested as above provided, if deemed advisable by the Administrator. Income from such investment or reinvestment shall be deposited in the respective fund from which the investment was made.

(d) All salvage proceeds realized by the Administrator under this title shall likewise be deposited in the appropriate respective fund.

(e) In order to place and maintain these funds in operative condition, the Administrator is authorized and empowered to issue to the Secretary of the Treasury from time to time and to have outstanding at any one time, in an amount not exceeding \$10,000,000,000 (or such greater amount as may be approved by the President) notes and other obligations in such forms and denominations, bearing such maturities, and subject to such terms and conditions as may be prescribed by the Administrator with the approval of the Secretary of the Treasury. Such notes or other obligations shall bear interest at a rate determined by the Secretary of the Treasury, taking into consideration the current average rate on outstanding marketable obligations of the United States of comparable maturities as of the last day of the month preceding the issuance of such notes or other obligations. The Secretary of the Treasury is authorized and directed to purchase any notes and other obligations to be issued hereunder and for such purpose he is authorized to use as a public debt transaction the proceeds from the sale of any securities issued under the Second Liberty Bond Act, as amended, and the purposes for which securities may be issued under such Act, as amended, are extended to include any purchases of such notes and obligations. The Secretary of the Treasury may at any time sell any of the notes or other obligations acquired by him under this section. All redemptions, purchases, and sales by the Secretary of the Treasury of such notes or other obligations shall be treated as public debt transactions of the United States. Funds borrowed under this section shall be deposited, in such proportions as the Administrator deems advisable, in such of the foregoing funds as he deems appropriate.

(f) Moneys in the funds established by the Administrator pursuant to this section may be used for the following purposes as deemed necessary by the Administrator:

(1) To enable the Administrator to carry out all functions under this title, including the payment of operating and administrative expenses, whenever feasible drawing moneys from the fund appropriate to the particular program in the course of which such expenses shall be incurred.

(2) To pay from the appropriate fund approved claims for loss under coverage issued under this title: *Provided, however,* That moneys to pay claims filed pursuant to the provisions of paragraphs (3) and (4) of subsection (b) of section 201 in this title may be taken from any one or more of the funds within the discretion of the Administrator.

(3) To repay to the Secretary of the Treasury sums borrowed from him in accordance with the provisions of subsection (e) of this section.

SEC. 207. No indemnity, insurance or reinsurance shall be provided under this title for risks eligible for insurance under other Federal programs, or to the extent that coverage is available on reasonable terms from other public or private sources.

SEC. 208. In providing insurance or reinsurance under this title, the Administrator shall use to the maximum practicable extent the facilities and services of private organizations and persons authorized to engage in the insurance business under the laws of any State or district, Territory or possession of the United States (including insurance companies, agents, brokers, and adjustment organizations); and the Administrator may arrange for payment of a reasonable compensation for such services.

SEC. 209. Any department or agency of the Federal Government engaged in making direct loans or advances, or in participating in, insuring or guaranteeing loans made by private lending institutions for construction, modernization, repair, rehabilitation, or purchase of property eligible for assistance under this title, may require as a condition for such future financial assistance that such property be insured against war damage to the extent such insurance is available.

SEC. 210. Upon disallowance of any claim against the Administrator under color of any insurance or reinsurance made available under this title, or upon refusal of the claimant to accept the amount allowed upon any such claim, the claimant may institute an action against the Administrator on such claim in the United States district court for any district in which a major portion (in terms

of value) of the insured property is located, in the case of property claims, or in which the insured person resides, in the case of personal claims. Any such action must be begun within one year after the date upon which the Administrator mails to the claimant notice of disallowance of the claim or within one year after the date upon which the claimant mails to the Administrator notice of refusal to accept the amount allowed by the Administrator, as the case may be. For the purposes of this section, the Administrator may be sued and he shall appoint one or more agents within the jurisdiction of each United States district court upon whom service of process can be made in any action instituted under this section. Exclusive jurisdiction is hereby conferred upon all United States district courts to hear and determine such actions without regard to the amount in controversy.

SEC. 211. As used in this title—

(a) The term "war damage" shall mean damage resulting from and the term "perils of war" shall mean perils resulting from (A) any hostile or warlike action by (i) any government or sovereign power (de jure or de facto) or any authority maintaining or using military, naval, or air forces, or (ii) an agent of any such government, power, or forces; or (B) any action taken by any Federal, State, or local government agency in hindering, combating, or defending against any such hostile or warlike action (whether actual, impending, or expected); or (C) disorder or other lawlessness accompanying the collapse of civil authority determined by the President to have resulted from any action referred to in clause (A) or (B) or from control by enemy forces.

(b) The term "hostile or warlike action" shall mean any attack or series of attacks by an enemy of the United States in any manner, including, but not limited to, attack by invasion, sabotage, or the use of bombs, shellfire, or nuclear, radiological, chemical, bacteriological, or other biological means, or other weapons or processes.

### TITLE III—GENERAL PROVISIONS

SEC. 301. (a) In carrying out his functions under this Act, the Administrator shall appoint an advisory committee of not less than three or not more than fifteen persons familiar with the problems of indemnity, insurance or reinsurance, to advise him with respect to the formulation of policies and the execution of functions under this Act.

(b) Persons who, while so serving, hold other remunerative employment with the United States shall receive no additional compensation for such service. Others so serving may receive compensation at not exceeding \$50 per diem, plus necessary travel expenses.

SEC. 302. In the performance of, and with respect to, the functions, powers, and duties vested in him by this Act, the Administrator shall (in addition to any authority otherwise vested in him), have the functions, powers, and duties set forth in sections 401, 402, and 405 of the Federal Civil Defense Act of 1950: *Provided, however*, That for the purposes of this Act, the Administrator may place not more than five positions in grades 16, 17, and 18 of the General Schedule established by the Classification Act of 1949, as amended, in addition to the number authorized by section 505 of the latter Act, and section 401 of the Federal Civil Defense Act of 1950: *And provided further*, That for the purposes of this Act, the Administrator may employ not more than fifty part-time or temporary personnel, in addition to the number authorized by section 401 of the Federal Civil Defense Act of 1950 and elsewhere in this title. Funds obtained or held by the Administrator in connection with the performance of his functions under this title shall be available for the administrative expenses of the Administrator in connection with the performance of such functions.

SEC. 303. The Federal Civil Defense Act of 1950 is hereby amended as follows:

(a) By striking out the words "Civil Defense" and inserting in lieu thereof the word "Disaster" in section 2 and by adding the following as a new paragraph at the end of section 2:

"It is also the policy and intent of Congress to provide a plan of disaster relief for the protection of life and property in the United States from damage caused by natural disaster. While adequate responsibility for disaster relief should be placed in the several States and their political subdivisions, the Federal Government shall provide necessary coordination and guidance through the Federal Disaster Administration, being vested with ample powers to perform such services, and shall provide necessary assistance as hereinafter authorized.";

(b) By inserting the following new paragraph (c) at the end of paragraph (b) in section 3 and relettering the following paragraphs accordingly:

"(c) The term 'natural disaster' means any flood, tidal wave, hurricane, tornado, blizzard, duststorm, hailstorm or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination or other air pollution, or volcanic eruption.";

(c) By inserting the words "or disaster relief" after the term "civil defense" each time it appears in relettered paragraphs (d) and (e) of section 3;

(d) By striking out the words "Federal Civil Defense Administration" and inserting in lieu thereof the words "Federal Disaster Administration" and by striking out the words "Federal Civil Defense Administrator" and inserting in lieu thereof the words "Federal Disaster Administrator" each time they appear in section 101;

(e) By striking out the words "Civil Defense Advisory Council" and inserting in lieu thereof the words "Disaster Advisory Council" and by inserting the words "and disaster relief" after the words "civil defense" in section 102;

(f) By inserting the words "and disaster relief" after the words "civil defense" each time they appear in section 201, by inserting the words "or imminent natural disasters" after the word "attacks" in subsection (c) of section 201, and by inserting the words "or a natural disaster" after the word "attack" each time it appears in subsection (g) of section 201;

(g) By inserting the words "and disaster relief" after the words "civil defense" in section 203;

(h) By inserting the words "or disaster relief" after the words "civil defense" in section 204;

(i) By repealing section 304; and

(j) By amending the short title of the Act to read: "Federal Disaster Act."

Sec. 304. Chapter XI of the Act of June 2, 1951 (65 Stat. 61) is hereby amended by striking out "\$5,000,000" and inserting in lieu thereof "\$6,000,000", and by inserting the words "and disaster relief" after the words "Civil defense".

Sec. 305. The Act of September 30, 1950 (64 Stat. 1109) is hereby amended as follows:

(a) By striking out the word "President" each time it appears therein and inserting in lieu thereof the words "Federal Disaster Administrator";

(b) By striking out the words "assurance of expenditure of a reasonable amount of the funds of the government of such State, local government of such State, local governments therein, or other agencies, for the same or similar purposes with respect to such catastrophe" in paragraph (a) of section 2 and inserting in lieu thereof the words "(1) evidence of the existence of a State fund, available solely for disaster relief, equal at the time of the first gubernatorial certification of need during any twelve-month period, to at least \$100,000, together with a commitment to apply all or so much of such fund as proves necessary within each twelve-month period toward reimbursing the Federal Government for moneys advanced on the basis of such certification of need, or (2) evidence of consent to allow the Federal Government, in such manner as the Administrator deems advisable, to offset against any moneys otherwise due or to become due to the State from any Federal program, \$100,000 or so much thereof as proves necessary toward reimbursing the Federal Government for moneys advanced on the basis of such certification of need; and shall give evidence satisfactory to the Administrator that maximum use is being made of available State and local personnel and facilities to assist in meeting the onslaught of disaster and that complete supervisory control of all such personnel and facilities will be vested in the Administrator, upon his request, for the duration of the emergency caused by the catastrophe";

(c) By striking out "\$5,000,000" and inserting in lieu thereof "\$10,000,000" in section 8, and by inserting a period after the word "discretion" and striking out the words following that word in the third sentence of said section; and

(d) By adding the following new section at the end of said Act:

"Sec. 9. Any provision of law to the contrary notwithstanding, in any major disaster, it shall be lawful for the Administrator to assume supervisory control of State and local personnel engaged in disaster relief work and to call forth such additional numbers of State and local government personnel (including members of civil defense organizations) as he may deem necessary to perform disaster relief functions, and to issue his orders for such purposes through the governor of the respective State or Territory, or the Board of Commissioners of the District of Columbia, from which such personnel come, to those among such personnel as he deems appropriate. Such control shall continue for the

period determined by the Administrator. No personnel so utilized shall become an employee of the Federal Government by virtue of such exercise of power by the Administrator."

SEC. 306. The Administrator shall, not later than August 1, 1956, and annually thereafter, submit to the Congress a report on activities under this Act, including therein such recommendations as may be deemed advisable.

SEC. 307. If any provision of this Act or the application of such provision to any person or circumstances shall be held invalid, the remainder of the Act and the application of such provision to any person or circumstance other than those as to which it is held invalid shall not be affected thereby.

#### SECTIONAL ANALYSIS OF DISASTER INSURANCE ACT OF 1956 (Lehman bill)

Short title—Disaster Insurance Act of 1956.

*Section 2.*—Declaration of purpose. To authorize Federal insurance program against risks of natural and manmade disasters. Single Federal agency with ample authority will administer program.

#### TITLE I—NATURAL DISASTER INSURANCE AND REINSURANCE

*Section 101.*—Authorize Federal Disaster Administrator (new title for Federal Civil Defense Administrator) to provide insurance and reinsurance against natural disaster risks for real and personal property in United States, Territories, and possessions.

*Section 102.*—Administrator to fix premium rates by type of insurance or reinsurance; and fix other terms and conditions and areas covered. Rates based on risks; to strike balance between self-supporting program and rates attractive to prospective buyers.

*Section 103.*—Administrator set types and location of property eligible, nature and limits of loss covered, and other necessary matters.

*Section 104.*—Administrator may exclude risks impracticable to cover; and may regulate classification and limits of risks assumed by him.

*Section 105.*—Limit to one person or State or local government, \$300,000. Approval of claim limited to lesser of (1) actual value or (2) replacement cost, less depreciation. \$200 loss deductible from each claim is mandatory.

*Section 106.*—Administrator may sell insurance to public body for benefit of its inhabitants. Liability not to exceed \$300,000 per inhabitant. This program to be self-supporting. Administrator to satisfy himself of public body's authority to buy insurance and pay premium from taxation or otherwise.

*Section 107.*—(a) Administrator may issue reinsurance regulations.

(b) Rates, terms, and conditions of policy reinsured under this title are subject to Administrator's approval.

(c) Administrator may offer a reinsurance program on portfolio basis under which he pays excess loss to ceding company for any single disaster. Create catastrophe excess loss reinsurance funds. Program to be self-supporting.

*Section 108.*—(a) No insurance or reinsurance to be offered if available on reasonable terms from other public or private source, except may cover all natural disasters in a blanket policy.

(b) No insurance or reinsurance to be offered on property not conforming to flood zoning laws.

*Section 109.*—(a) Administrator to use private insurance organizations to maximum, and may pay reasonable compensation.

(b) Administrator may make underwriting participation agreements with private insurance companies to share in profits or losses and premiums.

(c) Administrator may use public agencies and pay reasonable compensation.

(d) Administrator may receive and exchange information with public agencies and private insurance organizations.

*Section 110.*—Property to be acquired with Federal aid may be required to carry natural disaster insurance.

*Section 111.*—(a) Administrator to arrange prompt adjustment and payment of claims, collecting required amounts from private companies participating in underwriting.

(b) Disallowed claims or unsatisfactory allowances are subject to suit in United States district court where major value of property is located, if brought within 1 year.

*Section 112.*—(a) Administrator may establish (1) disaster insurance fund, (2) disaster reinsurance reserve fund, and (3) catastrophe excess-loss reinsurance fund.

(b) Insurance premiums go to disaster insurance fund. Reinsurance fees go to disaster reinsurance reserve fund, except if portfolio excess-loss coverage is offered, fees for it go into catastrophe excess-loss reinsurance fund.

(c) Fund moneys may be invested and reinvested in United States obligations.

(d) Salvage proceeds go to the appropriate fund of the three above, depending on program in which they were realized.

(e) Administrator may borrow up to \$1 billion from Secretary of Treasury. President may increase that limit. Notes evidencing borrowing to bear interest fixed by Secretary, considering going rate. Secretary to treat this as public-debt transaction. Funds borrowed go to such of three funds as Administrator decides.

(f) Three funds may be used to (1) pay operating and administrative expense of programs, (2) and (3) pay claims out of proper fund, and (4) repay Treasury borrowings.

*Section 113.*—Defines "natural disaster"—flood, tidal wave, hurricane, tornado, blizzard, duststorm, hailstorm, or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination or other air pollution, or volcanic eruption.

## TITLE II—MAN-MADE DISASTER INSURANCE AND REINSURANCE

*Section 201.*—(a) Administrator authorized to provide reasonable indemnity for war damage to persons or real or personal property.

(b) He may do so by insurance, reinsurance, or otherwise grant—

(1) reasonable protection against damage to real or personal property;

(2) reasonable protection against workmen's compensation (or occupational disease) liability;

(3) reasonable compensation for personal injury or death of civil-defense worker;

(4) reasonable compensation for personal or property damage in course of performing duties of civil-defense nature;

(5) reasonable compensation for personal injury, disease, or death from war perils.

(c) Administrator may make general exceptions for classes of property or persons covered.

*Section 202.*—(a) Premium or other charge to be made for such indemnity, except that to civil-defense workers or persons in civil-defense duties. Latter two groups must show injury or damage sustained under conditions making him eligible for indemnity.

(b) Administrator to fix uniform rates for (1) each type of property, (2) workmen's compensation liability coverage, and (3) personal injury, disease, or death, according to legal residence (since amount of insurance benefits will vary with legal residence).

(c) As basis for rates, Administrator shall estimate average risk involved for each class of coverage.

*Section 203.*—(a) Indemnify only for (1) property or persons in United States, district, Territory, or possession, (2) property in transit between any points in foregoing, and (3) transportation facilities touching any such point at time of damage or injury.

(b) With President's approval, Administrator may suspend protection in areas where United States loses control.

*Section 204.*—In measuring reasonableness of protection or compensation under this title, Administrator shall consider property value, its relative importance to national security, and State or local workmen's compensation or occupational disease laws (using Federal law if no similar law applies in any area).

*Section 205.*—(a) \$10 billion limit set on property coverage under this title.

(b) Claims limited to 75 percent of declared value of property.

(c) Administrator reserves right to pay 10 percent of claim 2 months after approval and balance within following year, if advisable for Federal credit or stability of national economy.

(d) Otherwise Administrator to pay claims promptly.

*Section 206.*—(a) Administrator to set up 4 insurance funds—(1) property indemnity fund; (2) workmen's compensation reserve fund; (3) civil defense indemnity fund; and (4) personal risk fund—and may create 3 reinsurance

funds—(1) property indemnity reinsurance fund; (2) workmen's compensation reinsurance reserve fund; and (3) personal risk insurance fund.

(b) Premiums and fees collected go to appropriate fund, depending on program.

(c) Fund moneys may be invested and reinvested in United States obligations.

(d) Salvage proceeds go to appropriate fund.

(e) Administrator may borrow up to \$10 billion from Secretary of Treasury, or more with President's approval. Notes bear interest at going rate as determined by Secretary of Treasury, who handles this as public debt transaction. Administrator may deposit moneys borrowed in above funds.

(f) Fund moneys may be used to—

(1) pay operating and administrative expenses under title, drawing from fund that matches program where feasible;

(2) pay claims (civil defense claims from any of funds);

(3) repay borrowings to Secretary of Treasury.

*Section 207.*—No insurance or reinsurance shall be offered for risks eligible under other Federal programs or to extent available from other public or private sources.

*Section 208.*—Administrator shall use to maximum private insurance organizations; may pay reasonable compensation.

*Section 209.*—Property to be acquired with Federal aid may be required to carry war damage insurance.

*Section 210.*—Disallowed claims or unsatisfactory allowances are subject to suit in United States district court where major value of property is located (property claims) or where insured resides (personal claims). Action to be brought within 1 year.

*Section 211.*—Defines—

(a) "war damage" and "perils of war"—resulting from (A) hostile or warlike action by government, power, or authority using military force, or agent of foregoing, or (B) action by Government agency in United States to defend against hostile or warlike action, or (C) disorder accompanying collapse of civil authority resulting from (A) or (B) above or enemy control.

(b) "hostile or warlike action"—attack by United States' enemy in any manner (includes nuclear and biological means).

### TITLE III—GENERAL PROVISIONS

*Section 301.*—(a) Administrator shall name advisory committee of 3 to 15 familiar with insurance problems.

(b) If United States employees, member receives no added compensation. If not, may receive up to \$50 per diem plus travel expense.

*Section 302.*—Administrator granted power to hire 5 extra supergrade employees and 50 part-time or temporary employees.

*Section 303.*—Amends Federal Civil Defense Act of 1950 as follows:

(a) Changes name of Federal Civil Defense Administration to Federal Disaster Administration and adds declaration of policy to cover natural disaster relief.

(b) Defines "natural disaster" as in section 113 of this bill.

(c) Makes definition of "organizational equipment" and "materials" include those used for disaster relief.

(d) Changes titles—Federal Civil Defense Administration to Federal Disaster Administration; Federal Civil Defense Administrator to Federal Disaster Administrator.

(e) Changes name of Civil Defense Advisory Council to Disaster Advisory Council; expands scope of its duties to include disaster relief.

(f) Broadens scope to include disaster relief in planning, delegation of power, providing warning service, training programs, information service, encouragement of interstate compacts, acquisition and stockpiling of materials, financial aid to States, and disposal of surplus property.

(g) Requires Administrator, through State Department, to arrange mutual disaster aid between States and neighboring countries.

(h) Protects distinctive insignia for disaster relief workers.

(i) Repeals provision relieving Federal Government of liability for property damage or personal injury resulting directly or indirectly from performance of civil defense duty by Federal agency or employee (saving rights of those entitled to Federal employees compensation). (NOTE.—This exemption from liability appears inconsistent with provisions of title II of this bill.)

(j) Changes short title of Federal Civil Defense Act of 1950 to Federal Disaster Act.

*Section 304.*—Amends Third Supplemental Appropriation Act, 1951, to increase by \$1 million (to \$6 million) the procurement fund to be used in acquiring equipment and materials, and includes disaster relief within its permissible use.

*Section 305.*—Amends Disaster Relief Act (Public Law 875, 82d Cong., approved September 30, 1950) as follows:

(a) Substitutes Federal Disaster Administrator (bill's new title for Federal Civil Defense Administrator) for President as administrator of disaster relief program.

(b) As basis for finding a "major disaster" exists, changes requirements State must meet. Instead of assuring reasonable expenditure of State funds, State must either (1) show it has a special \$100,000 disaster relief fund which it commits to use to repay Federal disaster relief advances in any 12-month period or (2) consent to allow Federal Government to offset an equal amount against Federal funds due State in the future, and State must satisfy Administrator maximum use is being made of available State and local personnel and facilities for disaster relief and agree to place their control in Administrator upon request for the duration of the disaster emergency.

(c) Doubles authorized appropriation for relief purposes (to \$10 million) and deletes statutory requirement that reports to Congress go to Appropriations and Public Works Committees, leaving committee referral of reports to discretion of the House and the Senate.

(d) Permits Administrator to assume control of State and local disaster relief personnel and call forth additional State and local government employees (including civil defense personnel), in manner comparable to that by which Federal Government calls the National Guard to Federal service. Orders go via governor to proper personnel. Administrator decides when he surrenders control (on end of emergency). Employees thus controlled by Administrator remain State and local government (not Federal) employees.

*Section 306.*—Administrator to file annual reports to Congress on activities under act and his recommendations; first due by August 1, 1956.

*Section 307.*—Separability provision.

## APPENDIX C

### PROVISIONS AND SECTIONAL ANALYSIS OF THE KENNEDY-SALTONSTALL BILL

[Committee print October 25, 1955]

[Intended to be proposed by Mr. Kennedy and Mr. Saltonstall]

**A BILL To provide for national flood insurance and reinsurance, and for other purposes**

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That this Act may be cited as the "National Flood Insurance Act of 1956".

#### DECLARATION OF PURPOSE

SEC. 2. It is the purpose of this Act to promote the national welfare by alleviating the widespread economic distress suffered from time to time within the United States, its Territories and possessions, as a result of floods, and the attendant impairment of the free flow of interstate and foreign trade and commerce, by providing direct governmental insurance of certain flood risks or by making insurance of such risks available through private insurance companies by means of governmental reinsurance.

#### FUNCTIONS

SEC. 3. (a) To carry out the purposes of this Act, the Administrator of the Small Business Administration (hereinafter referred to as "the Administrator") is authorized to provide, upon the payment of such premiums and subject to such terms and conditions as he may establish, either insurance or reinsurance, or both insurance and reinsurance, against damage to or loss of privately owned real property, including commercial, industrial, and residential property, due to any flood as defined by the Administrator occurring within the limits of the

United States, its Territories and possessions, with such general exceptions as the Administrator may deem advisable, whenever in the opinion of the Administrator such insurance or reinsurance cannot be obtained at reasonable rates or upon reasonable conditions from approved companies authorized to do insurance business in any State, Territory, or possession of the United States: *Provided*, That such program of insurance shall be so administered as not to serve as an inducement for unwarranted acquisition of facilities in areas which are subject to recurring floods.

(b) The Administrator shall from time to time prescribe (1) uniform premium rates for each type of insurance and/or reinsurance which he shall make available under authority of this Act for each type or class of property to be insured, and (2) the terms and conditions under which and the areas and subdivisions thereof within which each rate shall be applicable. All such rates shall be based insofar as practicable upon consideration of the risks involved and shall to the extent deemed practicable by the Administrator be adequate to cover all administrative and operating expenses arising under this Act, as well as reserves for probable losses. The Administrator may receive from or exchange with any State or Territorial insurance commission or agency or with any private corporation or association engaged in the writing of insurance against property loss within the United States such loss experience and other information as may be necessary for the establishment of such premium rates.

(c) The Administrator shall by regulation provide for the determination of (1) the types and location of property with respect to which insurance and/or reinsurance shall be granted, (2) the nature and limits of loss or damage in any area or subdivision thereof which may be covered by such insurance or reinsurance, (3) rates, terms, and conditions of such insurance or reinsurance, and (4) such other matters as may be necessary to carry out the purposes of this Act. The Administrator may decline such applications and risks and may establish from time to time such regulations with respect to the classification, limitation, and rejection of applications and risks as he shall deem advisable in order to carry out the purposes of this Act.

(d) In providing insurance and/or reinsurance, the Administrator may by contract arrange for the financial participation of any person or company authorized to do insurance business in any State of the United States in the underwriting of risks assumed, and for their proportionate participation in premiums and in any profits or losses realized or sustained. The Administrator shall utilize the facilities and services of private insurance companies, established insurance agents and brokers and established insurance adjustment organizations to the fullest extent possible, consistent with minimum cost of providing insurance protection.

(e) The aggregate amount of insurance issued by the Administrator covering the loss of or damage to any single piece of real property shall not exceed \$250,000. No claim shall be approved in an aggregate amount which exceeds the actual cash value or the cost of replacing, repairing, or rebuilding the damaged property with material of like kind and quality (less depreciation at the time of damage) whichever is lower: *Provided*, That the approved amount of any claim shall be reduced by \$300 plus 10 per centum of the remainder, or by such larger amount or percentage as may be prescribed by the Administrator in the insurance contract. The Administrator shall prescribe such regulations applicable to reinsurance as he may deem appropriate to give effect to the intent of the limitations in this subsection. The Administrator may from time to time prescribe such regulations regarding coverage available to subsidiary and affiliated corporations as it shall deem appropriate to effectuate the purpose of this subsection.

(f) The Administrator, on and after the first day of the sixth month following the enactment of this Act, may provide insurance or reinsurance in an aggregate amount not to exceed \$500,000,000 outstanding and in force at any one time, which limit may be increased, with the approval of the President, by further amounts of \$500,000,000 each on July 1, 1957, and July 1, 1958.

#### FINANCING

SEC. 4. (a) To carry out the functions authorized by this Act, there is authorized to be established in the Treasury of the United States a National Flood Insurance Fund (referred to hereinafter as the "Fund"). The capital of the Fund shall consist of such amounts as may be advanced to it from appropria-

tions. Such sums as may be required are authorized to be appropriated without fiscal year limitations for the purposes of the Fund.

(b) Advances shall be made to the Fund from the appropriations made therefor only when requested by the Administrator, with the approval of the President. The Administrator shall pay into miscellaneous receipts of the Treasury, at the close of each fiscal year, interest on such advances at a rate determined by the Secretary of the Treasury, taking into consideration the average rate on outstanding interest-bearing marketable public debt obligations of the United States.

(c) Premiums paid to the Administrator for insurance and reinsurance under this Act, interest earned on investments of the Fund, and receipts from any other operations under this Act, including salvage operations, shall be credited to the Fund. The Fund shall be available for the payment of liabilities under such insurance and reinsurance and for payment of all expenses of the Administrator under this Act.

(d) Whenever any capital in the Fund is determined by the Administrator to be in excess of its current needs, such capital shall be credited to the appropriation from which advanced where it shall be held for future advances. After liquidation of all outstanding advances, any cash in excess of current needs may be invested or reinvested by the Administrator in interest-bearing obligations of the United States or in obligations guaranteed as to interest and principal by the United States. The proceeds from the sale or redemption of the obligations held by the Administrator pursuant to this Act shall be credited to the Fund.

#### PAYMENT OF CLAIMS

SEC. 5. Under such regulations as the Administrator may prescribe, he shall adjust and pay valid claims either directly or through agents for losses covered by insurance and reinsurance under this Act. The Administrator shall collect from participating insurance companies such amounts as they may be obligated to contribute toward such losses.

#### COORDINATION WITH OTHER PROGRAMS

SEC. 6. (a) In carrying out the functions authorized in this Act, the Administrator shall consult with other agencies of the Federal Government and interstate, State, and local agencies having responsibilities for flood control and flood-damage prevention in order to assure that the insurance facilities offered are consistent with the programs of such agencies, and shall utilize the facilities and services of these and other public agencies to the fullest extent possible.

(b) No insurance or reinsurance shall be issued (1) for risks eligible for insurance provided by other Federal programs, or to the extent that coverage is available on reasonable terms from other private or public sources, or (2) for properties whose use is in conflict with State or local flood zoning laws.

(c) Any department or agency of the Federal Government engaged in making direct loans or advances, or in participating in, insuring, or guaranteeing loans made by private lending institutions, for the construction, modernization, repair, or purchase of property eligible for insurance under this Act may require as a condition for such future financial assistance that such property be insured against flood damage to the extent such insurance is available.

#### INSURANCE ADVISORY COMMITTEE

SEC. 7. The Administrator shall appoint an advisory committee, consisting of not less than six individuals experienced in the writing of insurance against property loss, to advise him with respect to the execution of his functions pursuant to this Act.

#### SECTIONAL ANALYSIS OF NATIONAL FLOOD INSURANCE ACT OF 1956

(Kennedy-Saltonstall bill)

*Short title.*—National Flood Insurance Act of 1956.

*Section 2. Declaration of purpose.*—To promote national welfare by alleviating economic distress in United States from floods and impairment of interstate and foreign commerce by providing direct Government insurance of certain flood risks or Government reinsurance.

**Section 3. Functions.**—(a) The Small Business Administrator is authorized to provide insurance and reinsurance against damage, to privately owned real property (whether commercial, industrial, or residential) due to flood within the United States, its Territories and possessions. Such insurance and reinsurance will be issued only when the Administrator believes it is not obtainable at reasonable rates or on reasonable conditions from insurance companies. The Administrator may make general exceptions from the program and shall handle it so as not to induce unwarranted acquisition of facilities in areas subject to recurring floods. The Administrator shall establish the terms and conditions and require premiums.

(b) The Administrator shall prescribe (1) uniform premium rates for each type of insurance and reinsurance offered for each type or class of property covered, and (2) terms and conditions under which each rate applies and the areas and subdivisions within which it applies. Rates shall be based as far as practicable upon consideration of risks involved. To the extent the Administrator deems practicable, rates shall be adequate to pay administrative and operating expenses, plus loss reserves. The Administrator may receive from and exchange with any State or territorial insurance commission or agency or private property-insurance corporation or association, loss experience and other information necessary to establish premium rates.

(c) The Administrator shall regulate (1) types and location of property insured or reinsured, (2) nature and limits of damage in any area or subdivision coverable by insurance or reinsurance, (3) rates, terms, and conditions, and (4) other necessary matters. The Administrator may decline applications and risks and establish regulations as to classification, limitation, and rejection of applications and risks as he deems advisable.

(d) The Administrator may contract for financial participation of any person or company authorized to write insurance in United States in underwriting risks, and for share in premiums and profits or losses. The Administrator shall use facilities and services of private insurance companies and established agents, brokers, and adjustment organizations to fullest possible extent consistent with minimum cost of insurance.

(e) Limit of insurance under this act for any piece of real property is \$250,000. No claim shall be approved in excess of the lower of (1) actual cash value or (2) cost of replacing damaged property with similar material (less depreciation). Minimum loss deductible is \$300 plus 10 percent of remainder. The Administrator may increase this amount. His reinsurance regulations shall carry out limits set in this section. The Administrator may regulate coverage for subsidiary and affiliated corporations.

(f) On first day of sixth month after passage of act the Administrator may provide insurance or reinsurance to limit of one-half billion dollars outstanding. This may be increased with Presidential approval by one-half billion dollars each on July 1 in 1957 and 1958.

**Section 4. Financing.**—(a) Authorizes establishment of national flood insurance fund in United States Treasury, supplied by appropriation. Authorizes appropriations required without fiscal year limits.

(b) Appropriations shall be placed in fund upon Administrator's request, with President's approval. The Administrator shall pay interest to United States Treasury on appropriations so used. Interest rate Secretary of the Treasury sets shall reflect average rate on United States public debt obligations.

(c) Premiums, interest earned on fund investments, and salvage and other operating receipts go into fund. The fund is available for insurance and reinsurance liabilities and operating expenses.

(d) Administrator may credit to appropriation for future use any excess capital in the fund. Excess cash in fund may be invested in United States obligations, proceeds going to fund.

**Section 5. Payment of Claims.**—The Administrator shall adjust and pay valid claims directly or through agents. He shall collect amounts due from participating insurance companies.

**Section 6. Coordination with other programs.**—(a) The Administrator shall consult Federal agencies and interstate, State, and local flood control agencies to assure that flood insurance offered will be consistent with their programs. He shall use the facilities and services of these and other public agencies as much as possible.

(b) No insurance or reinsurance shall be issued (1) for risks eligible for other Federal insurance or to the extent coverage can be had from other public

or private sources on reasonable terms, or (2) for properties used in conflict with State or local flood zoning laws.

(c) Any Federal agency lending or advancing money or participating in, insuring or guaranteeing loans by private lenders for construction, repair, or purchase of property may in future require carriage of flood insurance on the property, if eligible, as condition for such aid.

*Section 7. Insurance Advisory Committee.*—The Administrator shall name an advisory committee of six or more persons experienced in writing property insurance. The committee will advise the Administrator about carrying out his functions under this act.

## APPENDIX D

### PROVISIONS AND SECTIONAL ANALYSIS OF THE CARLSON BILL

[Committee print, October 25, 1955]

[Intended to be proposed by Mr. Carlson]

A BILL To establish a National Disaster Insurance Corporation, and for other purposes

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That this Act may be cited as the "National Disaster Insurance Corporation Act of 1956."

#### DECLARATION OF PURPOSE

SEC. 2. It is the purpose of this Act to promote the national welfare by alleviating the widespread economic distress suffered from time to time within the United States from certain national disasters, and the attendant impairment of the free flow of interstate and foreign trade and commerce, by providing, through a program of reinsurance of insurance companies, for reasonable cost insurance against property loss or damage caused by flood, tidal wave, earthquake, or hurricane.

#### ESTABLISHMENT OF CORPORATION

SEC. 3. (a) To carry out the purposes of this Act, there is hereby created as an agency of the United States a body corporate to be known as the National Disaster Insurance Corporation (hereinafter referred to as the "Corporation"). The principal office of the Corporation shall be located in the District of Columbia, but agencies or branch offices may be established elsewhere in the United States under rules and regulations prescribed by the Board of Directors.

(b) The Corporation shall have a nonassessable capital stock of \$50,000,000 subscribed by the United States of America. There is hereby authorized to be appropriated to the Secretary of the Treasury not more than \$50,000,000 for the purpose of subscribing to such stock. Receipts for payments by the United States of America for or on account of such stock shall be issued by the Corporation to the Secretary of the Treasury, and shall be evidence of the stock ownership by the United States of America. Sums so received by the Corporation shall be deposited to its credit in the National Disaster Insurance Fund established by section 10 of this Act.

#### MANAGEMENT AND PERSONNEL

SEC. 4. (a) The management of the Corporation shall be vested in a Board of Directors (hereinafter called the "Board") consisting of three persons appointed by the President of the United States by and with the advice and consent of the Senate, one of whom shall be designated by the President as Chairman of the Board. Not more than two members of the Board shall be members of the same political party. Each such appointment shall be for a term of six years, except that (1) the directors first appointed shall be appointed for terms of two, four, and six years, respectively, and (2) whenever a vacancy shall occur other than by expiration of term, the person appointed to fill such vacancy shall hold office for the unexpired portion of the term of his predecessor. The Chairman shall receive a salary at the rate of \$16,000 per annum, and other directors at the rate of \$15,000 per annum.

(b) Each director shall devote his time principally to the business of the Corporation. No person shall hold office as a director of the Corporation while

holding any office, position, or employment in any privately or publicly owned insurance company.

(c) So long as there shall be two members in office, vacancies shall not impair the powers of the Board to execute the functions of the Corporation, and two of the members in office shall constitute a quorum.

Sec. 5. Within the limitation of appropriated funds, the Board shall (1) select, appoint, employ, and fix the compensation of such officers, attorneys, experts, employees, and agents as shall be necessary for the transaction of the business of the Corporation, (2) define their authority and duties, (3) delegate to them such of the powers vested in the Corporation as the Board may determine, (4) require bond of such of them as the Board may designate, and (5) fix the penalties and pay the premiums of such bonds.

Sec. 6. (a) The Board may appoint from time to time (1) an advisory committee, consisting of not more than five members experienced in the writing of insurance against property loss, to advise the Corporation with respect to the execution of its functions pursuant to this Act, and (2) such part-time consultants and advisory personnel as the Board may deem necessary in carrying out the functions of the Corporation. Persons so appointed who, while so serving, hold other offices or positions under the United States shall receive no additional compensation for such service. Other persons so appointed shall receive (1) while actually so employed, such compensation, not in excess of \$50 per diem, as may be determined by the Board, and (2) actual necessary traveling and subsistence expenses, or a per diem allowance in lieu thereof.

(b) Service of an individual under this section shall not be deemed subject to the provisions of section 281 or 283 of the United States Code, unless the conduct made unlawful by such section is performed with respect to a matter in which the Corporation is directly involved.

#### GENERAL POWERS

##### SEC. 7. The Corporation—

(a) shall have succession in its corporate name until dissolved by or pursuant to an Act of Congress;

(b) may adopt, alter, and use a corporate seal, which shall be judicially noticed;

(c) may adopt, amend, and repeal bylaws, rules, and regulations for the conduct of its business and the exercise of the powers granted to it by law;

(d) may make contracts and purchase, lease, hold, and dispose of such real and personal property as may be necessary and incident to the conduct of its business;

(e) may sue and be sued in its corporate name in any State or Federal court of competent jurisdiction;

(f) may conduct or cause to be conducted such researches, surveys, and investigations as may be determined by the Board to be necessary and incident to the performance of its functions or the exercise of its powers;

(g) with the consent of any board, commission, independent establishment, or executive department of the Government, including any field service thereof, or of any wholly-owned or mixed-ownership Government corporation, may avail itself of the use of information, services, facilities, officers, and employees thereof in carrying out the provisions of this Act;

(h) may receive from or exchange with any State insurance commission or agency or with any private corporation or association engaged in the writing of insurance against property loss within the United States such loss-experience information as may be necessary to the establishment of premium rates for reinsurance authorized to be issued by the Corporation upon a sound actuarial basis and upon the lowest practicable level;

(i) shall be entitled to the free use of the United States mails in the same manner as the other executive agencies of the Government; and

(j) may exercise, by the Board or duly authorized officers or agents of the Corporation, all powers specifically granted by the provisions of this Act and such incidental powers as are necessary to carry out the functions and powers of the Corporation.

#### FUNCTIONS OF CORPORATION

SEC. 8. (a) The Corporation is authorized to provide such reinsurance of insurance companies against loss on account of insurance carried by such companies

against damage to, or loss of, real or personal property (including property owned by State or local governments) due to flood, tidal wave, earthquake, or hurricane, occurring within the United States or its Territories, as may be necessary to enable such companies to provide insurance against such damage or loss where it would otherwise be unavailable.

(b) The Corporation shall prescribe premium rates for the reinsurance authorized by this Act upon consideration of (1) the risks involved, and (2) the desirability in the public interest of providing insurance protection which would not otherwise be available.

(c) The Corporation shall by regulation provide for the determination of (1) the types of property with respect to which reinsurance will be granted, (2) the nature and limits of losses or damage which may be covered by such reinsurance, (3) other matters as may be necessary to carry out the purposes of this Act.

(d) Reinsurance shall be provided by the Corporation under this Act only to the extent that it is not otherwise available at reasonable rates and upon reasonable conditions from private sources. In providing such reinsurance, the Commission shall utilize the facilities and services of private insurance companies to the maximum extent practicable.

#### PAYMENT OF CLAIMS

SEC. 9. Under such regulations as the Corporation may prescribe, it shall adjust and pay valid claims for losses covered by reinsurance under this Act. Upon disallowance by the Corporation of any such claim, the claimant, within one year after the date of mailing of notice of disallowance by the Corporation, may institute an action on such claim in the United States district court for the district in which the insured property or the major part thereof shall have been situated. Exclusive jurisdiction is hereby conferred upon such court to hear and determine such action without regard to the amount in controversy.

#### NATIONAL DISASTER INSURANCE FUND

SEC. 10. (a) There is hereby established in the Treasury of the United States a permanent trust fund to be known as the national disaster insurance fund (referred to hereinafter as the "fund"). All premiums paid to the Corporation for reinsurance under this Act shall be deposited and covered into the Treasury to the credit of the fund, which, together with interest earned thereon, shall be available for the payment of liabilities under such reinsurance. Payments from the fund shall be made upon and in accordance with awards by the Corporation.

(b) The Corporation is authorized to set aside out of the fund such reserve amounts as may be required under accepted actuarial principles to meet all liabilities under such insurance. The Secretary of the Treasury is authorized to invest or reinvest all or any part of the remainder thereof in interest-bearing obligations of the Government of the United States, or in obligations guaranteed as to principal and interest by such Government, and to sell such obligations for the purposes of such fund.

(c) Administrative expenses of the Corporation shall not be paid from the fund, but shall be borne by the Government of the United States. There is hereby authorized to be appropriated to the Corporation, out of any money in the Treasury not otherwise appropriated, such sums as may be necessary for the administration and operation of the Corporation.

#### ANNUAL REPORT

SEC. 11. The Corporation shall make a comprehensive annual report of its operations to the Congress as soon as practicable after the first day of January in each year.

#### EXEMPTION FROM TAXATION

SEC. 12. The Corporation, including its franchise, capital, reserves and surplus, and its income and property, shall be exempt from all taxation now or hereafter imposed by the Government of the United States, any Territory, dependency or possession thereof, any State, county, or municipality, or by any other local taxing authority.

## MISCELLANEOUS PROVISIONS

SEC. 13. (a) The Board shall designate an agent upon whom service of process may be made in each State, Territory, or jurisdiction in which property upon which the Corporation has issued insurance may be situated.

SEC. 14. Section 101 of the Government Corporation Control Act is amended (a) by striking out "and" immediately preceding the name "Tennessee Valley Associated Cooperatives, Incorporated", and (b) by inserting immediately after such name a semicolon and the following: "and National Disaster Insurance Corporation."

## SECTIONAL ANALYSIS OF NATIONAL DISASTER INSURANCE CORPORATION ACT OF 1956

(Carlson bill)

*Short title.*—National Disaster Insurance Corporation Act of 1956.

*Section 2. Declaration of purpose.*—To promote national welfare by alleviating economic distress in United States from certain national disasters and impairment of interstate and foreign commerce by providing, through reinsurance of insurance companies, reasonable cost insurance against property damage from flood, tidal wave, earthquake, or hurricane.

*Section 3. Establishment of Corporation.*—(a) Creates National Disaster Insurance Corporation as United States agency, with main office in District of Columbia and branches permitted elsewhere.

(b) Authorized capital is \$50 million stock subscribed by United States. Authorizes appropriation of up to \$50 million to Secretary of the Treasury to subscribe to such stock. Secretary to issue receipts to Corporation as evidence of stockownership by United States. Proceeds to be deposited to Corporation's credit in national disaster insurance fund established by section 10.

*Section 4. Management and personnel.*—(a) Three-man Board of Directors to manage Corporation. Appointed by President subject to Senate confirmation. President names one as Chairman of Board. No more than two to belong to same political party. Term, 6 years (original terms staggered 2, 4, and 6 years, respectively). Person appointed to fill vacancy holds for remainder of term. Salary: Chairman, \$16,000; other Directors, \$15,000 per annum.

(b) Directors to devote time principally to Corporation. Persons holding office or employment in any privately or publicly owned insurance company aren't eligible for directorship in Corporation.

(c) Two Directors are a quorum, and Board may act as long as two members hold office.

*Section 5. Housekeeping provisions.*—Within funds appropriated, Board shall (1) employ and pay officers, attorneys, experts, employees, and agents necessary; (2) define their duties and authority; (3) delegate Board powers to them as determined; (4) require bond of them as Board designates; and (5) fix bond penalties and pay premiums.

*Section 6. Advisory Committee and consultants.*—(a) Board may appoint (1) Advisory Committee of not over 5 experienced in writing property insurance, to advise on execution of Corporation's functions; and (2) part-time consultants and advisers Board deems necessary. United States employees receive no added pay for any of above service. Others receive (1) not over \$50 per day when actually employed, as Board determines, and (2) travel and subsistence (or per diem allowance).

(b) Persons serving under this section are excluded from the provisions of 18 United States Code, sections 281 and 283, except when their conduct is on a matter directly involving the Corporation.

*Section 7. General powers.*—The Corporation—

(a) has succession until dissolved by Congress;

(b) may use corporate seal, judicially noticed;

(c) may make bylaws, rules, and regulations;

(d) may make contracts and buy, lease, hold, and dispose of real and personal property necessary and incident to its business;

(e) sue and be sued in State and Federal courts;

(f) conduct research, surveys, and investigations necessary and incident to its functions and powers;

(g) use employees and facilities of Government agencies, with consent of agency;

(h) receive or exchange loss-experience information with State insurance commission or agency or private property insurance corporation or association; to help set reinsurance premium rates on actuarial basis and on lowest practicable level;

(i) has franking privilege; and

(j) may, by Board or Corporation officers or agents, exercise powers granted by act plus those incidentally necessary.

**Section 8. Function of Corporation.**—(a) Authorized to provide reinsurance against loss by insuring companies on policies issued against real or personal property damage from flood, tidal wave, earthquake, or hurricane in United States, as necessary to enable companies to issue such insurance otherwise unavailable. Includes State and local government property.

(b) Reinsurance premium rate to be fixed by Corporation, considering (1) risks and (2) public interest desirability of providing insurance otherwise unavailable.

(c) Corporation by regulation shall determine (1) types of property reinsured, (2) nature and limits of reinsurance damage, (3) other necessary matters.

(d) Reinsure only to extent not available from private sources at reasonable rates on reasonable conditions. Use services of private insurance companies to maximum.

**Section 9. Payment of claims.**—Corporation to adjust and pay valid claims for reinsured losses. On claim disallowance, claimant may sue in 1 year after disallowance notice mailed. Sue in United States district court for district where most of the insured property is located. Exclusive jurisdiction given such court, regardless of amount in controversy.

**Section 10. National disaster insurance fund.**—(a) Establishes permanent trust fund in United States Treasury, known as national disaster insurance fund. All reinsurance premiums go into it, including interest earned. Fund is available for payment of reinsurance liabilities. Corporation awards payments from fund.

(b) Corporation authorized to create actuarial reserve funds out of fund. Secretary of the Treasury may invest rest of fund in United States obligations.

(c) Administrative expense of Corporation shall be paid by United States, not out of fund. Appropriation of necessary amounts authorized for that purpose.

**Section 11. Annual report.**—Corporation to make comprehensive annual operations report to Congress as soon as practicable after beginning of each year.

**Section 12. Exemption from taxation.**—Corporation (franchise, capital, reserve, surplus, income, and property) exempt from Federal, State, and local taxation.

**Section 13. Miscellaneous provisions.**—(a) Board to name agent to accept service of process in each jurisdiction where corporation reinsured property is located.

**Section 14.**—Corporation subjected to Government Corporation Control Act.

## APPENDIX E

### PROVISIONS AND SECTIONAL ANALYSIS OF THE STAFF BILL

[Committee print, October 25, 1955].

#### A BILL To provide for indemnity against disasters, and for other purposes

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That this Act may be cited as the Disaster Indemnity Act of 1956.

#### DECLARATION OF PURPOSE

SEC. 2. The repeated occurrence of natural disasters and the threat of war damage in the United States, its territories and possessions results in undue interference with the general welfare of its residents, the adequacy of commercial and industrial facilities and the production and distribution of goods for use in interstate commerce and foreign trade, and impairs the common defense of the Nation. In the absence of an adequate program through the operation of private enterprise to make reimbursement for losses caused by disasters or war damage,

it is the intention of the Congress that the Federal Government participate in a program to provide reimbursement for such losses by means of direct Federal indemnity or reinsurance.

## FUNCTIONS

SEC. 3. (a) In order to carry out the purposes of this Act the President, through the Administrator of the Small Business Administration or such other existing officer or agency of the Government as he may designate, is authorized to provide indemnity and reinsurance against losses resulting from damage to or destruction of real or personal property (including property owned by State or local governments) due to any natural disaster occurring within the United States, its Territories, or its possessions: *Provided, however,* That such indemnity or reinsurance may be provided only if it cannot be obtained at reasonable rates or upon reasonable conditions from a company authorized to do an insurance business in any State, Territory, or possession of the United States.

(b) The President or his designee shall from time to time prescribe fees and premium rates for indemnity and reinsurance authorized in accordance with the provisions of this Act, and establish terms and conditions for providing such indemnity or reinsurance. In exercising the authority conferred upon them by this subsection, the President or his designee shall take into consideration the risks insured against, the desirability in the public interest of providing indemnity or insurance protection and the aim of providing from premiums collected under this Act, investment income thereon and salvage receipts, a sum sufficient to meet administrative and operative expenses in addition to reserves for probable losses.

(c) The President or his designee shall by regulation provide for determining the types of property with respect to which indemnity or reinsurance will be provided under this Act, the nature and limits of losses or damage for which such indemnity or reinsurance will be provided and such other matters as are deemed necessary to carry out the purposes of this Act: *Provided, however,* That in the category of residential property designed for the use of one to four families, the aggregate liability on a single property under such indemnity or insurance so reinsured shall not exceed \$60,000, and in no category shall the total liability under any indemnity or insurance so reinsured exceed \$250,000 on any property in a single area covered by a separate agreement for indemnity or insurance policy so reinsured: *And provided further,* That under any reinsurance agreement, the President or his designee may provide reinsurance to the maximum of not exceeding 100 per centum of the first \$1,000 of approved claim of loss under any policy so reinsured, not exceeding 100 per centum of all approved claims of loss under any such policy in excess of \$50,000, and not exceeding 80 per centum of approved claims of loss between those amounts under any policy so reinsured.

(d) The liability of the President or his designee under indemnity or reinsurance agreements under this section shall not exceed \$2,000,000,000 at any one time.

(e) The President or his designee is authorized to determine the maximum premium rate permissible to be charged for any policy of insurance reinsured under the provisions of this Act, and all terms and conditions of any such policy shall be subject to the approval of the President or his designee.

(f) In issuing and administering indemnity and reinsurance coverage under this Act, the President or his designee shall use to the maximum extent practicable the services of private companies authorized to do an insurance business in any State, Territory, or possession of the United States, pursuant to agreements hereby authorized to be entered into between the President or his designee and such companies prescribing their respective rights and obligations, including provision for any such company to act as underwriting agent or claim agent, or both, on behalf of the President or his designee, and provision for reasonable compensation to be paid for services rendered by such company pursuant to such agreements.

(g) The President or his designee may receive from or exchange with any State or Territorial insurance commission or agency or with any private corporation or association experienced in the problems of indemnity, insurance or reinsurance, such information as may be useful in the establishment of indemnity fees and reinsurance rates and the administration of the programs authorized under the provisions of this Act.

(h) The President or his designee (1) shall appoint an advisory committee of not less than three nor more than twenty-five persons familiar with the problems of indemnity, insurance, or reinsurance to advise him with respect to

the execution of functions under this Act and (2) may employ such part-time consultants and advisory personnel, without regard to the civil service and classification laws, as he may deem necessary in carrying out the purposes of this Act. Persons who, while so serving, hold other remunerative employment with the United States shall receive no additional compensation for such service. Others so serving may receive compensation at not exceeding \$50 per diem, plus necessary travel expenses.

Sec. 4. (a) Under such regulations as the President or his designee shall prescribe, he shall arrange for prompt payment of approved claims of loss under any indemnity or reinsurance coverage issued under the provisions of this Act.

(b) Upon disallowance of any claim for loss under such indemnity or reinsurance coverage, the claimant, within one year after the date of mailing of the notice of disallowance, may institute an action on such claim in the United States district court for the district in which the property, or the major value thereof, covered by the indemnity or reinsurance agreement is located. Exclusive jurisdiction is hereby conferred upon such court to hear and determine such action without regard to the amount in controversy.

Sec. 5. (a) To carry out the functions authorized by this Act, the President or his designee shall establish a Disaster Indemnity Fund and a Disaster Reinsurance Reserve Fund. All indemnity fees collected under section 3 of this Act shall be deposited in the Disaster Indemnity Fund. All reinsurance premiums collected under section 3 of this Act shall be deposited in the Disaster Reinsurance Reserve Fund.

(b) Moneys in both such funds may be invested in obligations of the United States or in obligations guaranteed as to principal and interest by the United States. Such obligations may be sold and the proceeds reinvested as above provided, if deemed advisable by the President or his designee. Income from such investment or reinvestment shall be deposited in the respective fund from which the investment was made.

(c) All salvage proceeds realized by the President or his designee under this Act shall likewise be deposited in the appropriate respective fund.

(d) In order to place and maintain these two funds in operative condition, the President or his designee is authorized and empowered to issue to the Secretary of the Treasury from time to time and to have outstanding at any one time, in an amount not exceeding \$1,000,000,000 (or such greater amount as may be approved by the President) notes and other obligations in such forms and denominations, bearing such maturities, and subject to such terms and conditions as may be prescribed by the issuer with the approval of the Secretary of the Treasury. Such notes or other obligations shall bear interest at a rate determined by the Secretary of the Treasury, taking into consideration the current average rate on outstanding marketable obligations of the United States of comparable maturities as of the last day of the month preceding the issuance of such notes or other obligations. The Secretary of the Treasury is authorized and directed to purchase any notes and other obligations to be issued hereunder and for such purpose he is authorized to use as a public debt transaction the proceeds from the sale of any securities issued under the Second Liberty Bond Act, as amended, and the purposes for which securities may be issued under such Act, as amended, are extended to include any purchases of such notes and obligations. The Secretary of the Treasury may at any time sell any of the notes or other obligations acquired by him under this section. All redemptions, purchases and sales by the Secretary of the Treasury of such notes or other obligations shall be treated as public debt transactions of the United States. Funds borrowed under this section shall be deposited, in such proportions as the President or his designee deems advisable, in the Disaster Indemnity Fund and the Disaster Reinsurance Reserve Fund.

(e) Moneys in the Disaster Indemnity Fund and the Disaster Reinsurance Reserve Fund may be used for the following purposes as deemed necessary by the President or his designee:

(1) to enable the President or his designee to carry out all functions under this Act, including the payment of operating and administrative expenses;

(2) to pay from the Disaster Indemnity Fund approved claims for loss under indemnity coverage issued by the President or his designee under this Act;

(3) to pay from the Disaster Reinsurance Reserve Fund approved claims under reinsurance agreements entered into by the President or his designee under this Act; and

(4) to repay to the Secretary of the Treasury sums borrowed from him in accordance with the provisions of subsection (d) of this section.

SEC. 6. No indemnity or reinsurance shall be provided under this Act (1) for risks eligible for insurance under other Federal programs, or to the extent that coverage is available on reasonable terms from other public or private sources, or (2) for property used in conflict with pertinent zoning laws applicable to floods or other natural disasters.

SEC. 7. (a) In recognition of recent catastrophic losses suffered by persons due to natural disasters, the President or his designee, under such regulations as he may prescribe, is hereby authorized to indemnify to the extent of 50 per centum of unreimbursed proven loss all persons who suffered loss of property during the current fiscal year as a result of a natural disaster constituting a major disaster within the meaning of that term as defined in the Act of September 30, 1950, as amended.

(b) There are hereby authorized to be paid out of the Disaster Indemnity Fund established in accordance with this Act such sums as may be necessary to carry out the provisions of this section.

SEC. 8. (a) Any provision of this Act to the contrary notwithstanding, upon a finding by the President that such action is necessary in the public interest, the President or his designee is authorized to provide, through indemnity or reinsurance, reasonable protection against war damage to real and personal property or resulting in personal injury or death of persons.

(b) Such protection shall be made available upon such terms and conditions and upon payment of such charges as the President or his designee may establish, in accordance with the provisions of this Act.

(c) Any provision of this Act to the contrary notwithstanding, the liability of the President or his designee under protection made available under this section shall not exceed \$10,000,000,000 at any one time.

(d) Upon the making of the finding required by subsection (a) of this section, the President or his designee shall establish a War Damage Fund and is authorized to transfer to it from the Disaster Indemnity Fund not in excess of \$100,000,000. Such transfer shall be deemed to constitute a non-interest-bearing loan repayable at a time or times designated by the President or his designee. The War Damage Fund shall be administered for the purposes of this section in the same manner as the Disaster Indemnity Fund and the Disaster Reinsurance Reserve Fund are administered for the purposes of the other sections of this Act. The authority vested in the President or his designee by section 5 (d) of this Act may also be used for the benefit of the War Damage Fund.

SEC. 9. As used in this Act—

(a) The term "natural disaster" shall mean any flood, tidal wave, hurricane, tornado, blizzard, duststorm, hailstorm or other severe storm, earthquake, explosion, landslide, snowslide, severe freeze, drought, smog, radioactive contamination or other air pollution, or volcanic eruption.

(b) The term "war damage" shall mean damage resulting from (A) any hostile or warlike action by (i) any government or sovereign power (de jure or de facto) or any authority maintaining or using military, naval, or air forces, or (ii) an agent of any such government, power, or forces; or (B) any action taken by any Federal, State, or local government agency in hindering, combating, or defending against any such hostile or warlike action (whether actual, impending, or expected); or (C) disorder or other lawlessness accompanying the collapse of civil authority determined by the President to have resulted from any action referred to in clause (A) or (B) or from control by enemy forces.

(c) The term "hostile or warlike action" shall mean any attack or series of attacks by an enemy of the United States in any manner, including, but not limited to, attack by invasion, sabotage, or the use of bombs, shellfire, or nuclear, radiological, chemical, bacteriological or other biological means, or other weapons or processes.

SEC. 10. The President or his designee shall, not later than August 1, 1956, and annually thereafter, submit to the Congress a report on activities under this Act, including therein such recommendations as may be deemed advisable.

SEC. 11. If any provision of this Act or the application of such provision to any person or circumstances shall be held invalid, the remainder of the Act and the application of such provision to any person or circumstance other than those as to which it is held invalid shall not be affected thereby.

## SECTIONAL ANALYSIS OF DISASTER INDEMNITY ACT OF 1956

(Staff bill)

*Short title.*—Disaster Indemnity Act of 1956.

*Section 2.*—Purpose of act to arrange Federal participation in reimbursement of natural disaster and war damage loss through indemnity or reinsurance, in absence of private enterprise program to do so.

*Section 3.*—(a) President to name Small Business Administration or other existing Federal agency to handle program. Authorizes indemnity or reinsurance against natural disaster (as defined in act) loss to real or personal property owned privately or by State or local governments. Program operates only if indemnity or reinsurance isn't reasonably available from private insurance companies.

(b) Indemnity fees and reinsurance rates and other terms and conditions to be fixed by President or designee. Consider risks, public interest, and aim to achieve self-supporting program.

(c) Regulation to govern types of property covered, nature and limits of loss covered. \$60,000 limit placed on coverage of 1- to 4-family residences; \$250,000 limit on other property under any one policy. On reinsurance, Federal Government may assume first \$1,000 loss and all exceeding \$50,000 per policy; and up to 80 percent of loss between those limits.

(d) Aggregate Federal liability for indemnity and reinsurance against natural disaster loss—\$2 billion at any one time.

(e) Terms and conditions of policy reinsured under this act are subject to Federal approval.

(f) Private insurance companies to be used to maximum in this program—particularly as underwriting agents and claim agents. Reasonable compensation to be paid for services.

(g) Federal Government may exchange helpful information with other governmental and private organizations.

(h) Provides for advisory committee of 3 to 25 familiar with insurance problems. Authorizes use of consultants. Compensation up to \$50 per day plus travel expense, unless already receiving Federal compensation.

*Section 4.*—(a) Arrange prompt payment of approved claims.

(b) Grants judicial review of claim disallowance. Confers jurisdiction on Federal district courts.

*Section 5.*—(a) Authorizes disaster indemnity fund (for indemnity agreements) and disaster reinsurance reserve fund (for reinsurance contracts). Indemnity fees deposited in disaster indemnity fund. Reinsurance charges deposited in disaster reinsurance reserve fund.

(b) Moneys in both funds may be invested in United States obligations.

(c) Salvage proceeds deposited in appropriate fund of the two.

(d) Administrator of program authorized to borrow up to total of \$1 billion from United States Treasury for funds, as needed (or more with President's approval). Interest rate on borrowing fixed by Secretary of Treasury.

(e) Disbursements from both funds permitted as follows:

(1) To carry out act (includes operating costs);

(2) and (3) to pay approved claims (indemnity coverage from disaster indemnity fund; reinsurance coverage from disaster reinsurance reserve fund);

(4) to repay borrowings from United States Treasury.

*Section 6.*—No indemnity or reinsurance to be issued under act (1) for risks coverable by other Federal programs (e. g., crop insurance) or public or private programs on reasonable terms, or (2) for property used in conflict with local flood zoning laws.

*Section 7.*—(a) Authorizes indemnity to persons suffering loss in recent major disasters, to extent of half their unreimbursed proven loss.

(b) Disaster indemnity fund may be used for this purpose.

*Section 8.*—(a) Program of war damage indemnity and reinsurance may be begun upon Presidential finding it is necessary in public interest. May cover real and personal property and personal injury and death.

(b) Terms and conditions to be fixed by President or designee, in accordance with this act.

(c) Aggregate Federal liability under war damage program limited to \$10 billion at any one time.

(d) For this program provide war damage fund created by up to \$100 million loan without interest from disaster indemnity fund. Use this fund comparably to use of disaster indemnity fund and disaster reinsurance reserve fund. Borrowing power from Treasury authorized for benefit of this war damage fund.

*Section 9.*—(a) Disaster—flood, tidal wave, hurricane, tornado, blizzard, dust-storm, hailstorm or other severe storm, earthquake, explosion, landslide, snow-slide, severe freeze, drought, smog, radioactive contamination or other air pollution, or volcanic eruption.

(b) War damage—(A) from hostile or warlike action by government or authority using armed force, or their agents; (B) from defensive action against such action by government; (C) from disorder accompanying collapse of civil authority determined by President to have resulted from (A) or (B) above or control by enemy forces.

(c) Hostile or warlike action—any attack by United States enemy in any manner (expressly includes nuclear weapon and bacteriological attacks).

*Section 10.*—President or designee to report to Congress annually.

*Section 11.*—Separability clause.



## GLOSSARY OF TERMS

**M. G.**—Furnished by the Editor of the forthcoming Meteorological Glossary.  
**Mr. Ralph E. Hushke** of the American Meteorological Society.

**N. C.**—The New Century Dictionary.

- avalanche** —A large mass of snow, ice, etc., detached from a mountainslope and sliding or falling suddenly downward. **N. C.**
- blizzard** —A severe weather condition characterized by strong winds bearing a great amount of snow (mostly fine, dry snow picked up from the ground), and cold temperatures. The U. S. Weather Bureau specifies a wind of 32 m. p. h. or higher, low temperatures and sufficient snow in the air to reduce visibility to less than 500 feet; and for a "severe" blizzard: wind speeds exceeding 45 m. p. h., temperatures near or below 10° F., and visibility reduced by snow to near zero. **M. G.**
- A violent storm of wind with dry, driving snow and intense cold, frequent on the plains of North America east of the Rocky Mountains. **N. C.**
- cyclone** —Originally, any of certain storms in which the wind was supposed to have a circular motion; now, an extensive horizontal movement of the atmosphere spirally around and toward a gradually progressing central region of low barometric pressure, sometimes moderate in character, and sometimes violent, as a hurricane, tropical storm, etc. (distinguished from a tornado which is less extensive and has its origin in a vertical disturbance of the atmosphere; popularly, a tornado). From Greek word meaning move in a circle.
- drought** —Dryness; specifically, dry weather, or want of rain. **N. C.**
- dust storm** —An unusual, frequently severe weather condition characterized by strong, turbulent winds and dust-filled air. Prerequisite to a dust storm is a period of drought over an area of normally arable land, thus providing the fine particles of dust which distinguish it from the coarser, more common "sandstorm" of desert regions. **M. G.**
- A storm of wind which raises dense masses of dust into the air, as in a desert region. **N. C.**
- earthquake** —A vibration or movement of a part of the earth's surface, due to the faulting of rocks, to volcanic forces, etc. **N. C.**
- explosion** —A violent expansion or bursting with noise, as of gunpowder or a boiler. **N. C.**
- eye of the storm** —The central portion, or "core," of a tropical cyclone (hurricane, typhoon) around which the destructive winds revolve; it is characterized by little or no precipitation, light winds, little cloudiness and warm temperatures. The outer boundary of the eye, its "wall," is formed by the main cloud mass of the tropical cyclone, and is marked by a sharp increase in wind speed. The eye may be from less than five miles to tens of miles in diameter, and ideally is circular in shape. **M. G.**
- flood** —The damaging condition occurring when water rises to overflow the natural or man-made channel or other area to which it is usually confined. **M. G.**
- A great flowing or overflowing of water, especially over land not usually submerged; an inundation; a deluge—the Flood, the universal deluge recorded as having occurred in the days of Noah (see Genesis vii). **N. C.**
- freeze** —The condition which exists when over a widespread area the surface temperature of the air remains below freezing (32° F.) for a sufficient time to constitute the characteristic feature of the weather. **M. G.**

- frost** —The act or process of freezing, or the state of being frozen; a state of the temperature which occasions the freezing of water; also, a covering of minute ice-needles formed from the atmosphere at night upon the ground and exposed objects when these have cooled by radiation below the dew-point and when the dew-point is below the freezing point; frozen vapor. N. C.
- glaze** —A coating of "clear ice" on terrestrial objects; the frequently hazardous product of an "ice storm." M. G.
- glaze storm** —See "ice storm."
- hail** —Pellets or small (usually rounded) masses of ice falling from the clouds in a shower; also, a shower or storm of such masses. N. C.
- hurricane** —The name for a "tropical cyclone" (see below) of Atlantic or Caribbean origin. It is general practice not to call such a storm a hurricane unless its winds are of "hurricane force" (75 m. p. h. or higher). M. G.
- A violent tropical cyclonic storm; any great windstorm. N. C.
- ice storm** —A storm of middle-latitude winters characterized by a fall of "freezing rain." The attendant formation of "glaze" on terrestrial objects creates many hazards. M. G.
- landslide** —The sliding down of a mass of soil, detritus, or rock on a steep slope. N. C.
- smog** —(from sm(oke) and (f)og). A combination of smoke and fog in the atmosphere (colloquial). N. C.
- snowslide** —The sliding down of a mass of snow on a steep slope. N. C.
- squall** —A sudden, often destructive, increase in wind speed caused by large scale atmospheric instability (vertical wind motion) locally superimposed upon the general wind pattern. M. G.
- storm** —A disturbance of the normal condition of the atmosphere, manifesting itself by winds of unusual force or direction, often accompanied by rain, snow, hail, thunder and lightning, or flying sand or dust; a tempest; also, a heavy fall of rain, snow, or hail, or a violent outbreak of thunder and lightning, unaccompanied by strong wind. N. C.
- storm surge** —A rise or piling-up of water against the shore, produced by wind stress and atmospheric pressure differences in a storm. This often is popularly, but erroneously, referred to as a "tidal wave." M. G.
- tidal wave** —Either of the two great wave-like swellings of the ocean surface (due to the attraction of the moon and sun) which move around the globe on opposite sides and give rise to the phenomenon called tide; also, a large destructive ocean wave produced by an earthquake or the like. N. C.
- tornado** —An extremely intense, compact, spiralling column of air, pendant from a cumulonimbus (thunderstorm) cloud. It is caused by excessive atmospheric instability, begins as a whirl within and at the base of the parent cloud, grows downward (funnel cloud), and may reach the earth (tornado) as the most locally destructive of all weather phenomena. Their winds have never been measured, but have been estimated at greater than 300 m. p. h. Tornadoes are of the order of hundreds of yards in diameter; they travel over the earth at 25 to 40 m. p. h., and cover distances from a few hundred yards to many miles. M. G.
- A violent thunderstorm (now rare); also, a violent squall or whirlwind of small extent, as those occurring during the summer months on the west coast of Africa; specifically, a destructive rotatory storm of the middle United States, usually appearing as a whirling, advancing funnel pendent from a mass of black cloud. N. C.
- tropical cyclone** —An intense rotational storm which originates over tropical ocean areas. Ideally, a mature tropical cyclone is nearly circular in shape; it dominates the weather over thousands of square miles; and its cyclonically rotating winds often exceed speeds of 100 m. p. h. The entire wind, cloud, and precipitation system which revolves about the "eye of the storm" moves as a unit, often for thousands of miles, before dissipating over a land area or losing its tropical character over higher latitudes. M. G.

- tropical storm** —General term for a “tropical cyclone”; most frequently used (in the United States) when the storm winds are less than “hurricane force” (75 m. p. h.). M. G.
- typhoon** —A violent storm or tempest occurring in India; also, a violent hurricane occurring in the China seas and their environs, chiefly during the months of July, August, September, and October. From Portuguese tufão, Arabic tufan (tempest, hurricane) perhaps also, in part, Chinese ‘ai fung (great wind). N. C.
- volcano** —In scientific use, a vent in the earth’s crust through which molten rock (lava), steam, ashes, etc., are expelled from within, either continuously or at regular or irregular intervals, gradually forming a conical heap (or in time a mountain) commonly with a cup-shaped hollow (crater) about the vent. From the fire-god Vulcan whose workshop was fabled to be under Mount Etna. N. C.



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