Considerations for a Catastrophic Declaration: Issues and Analysis

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Summary

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act) is the principal authority governing federal emergency and disaster response in the United States. The act authorizes the President to issue three categories of declaration: (1) major disaster, (2) emergency, or (3) fire assistance declarations in response to incidents that overwhelm the resources of state and local governments. Once a declaration is issued, a wide range of federal disaster assistance becomes available to eligible individuals and households, public entities, and certain nonprofit organizations. Disaster assistance authorized by the Stafford Act is appropriated by Congress and provided through the Disaster Relief Fund.

Emergency declarations supplement and promote coordination of local and state efforts such as evacuations and protection of public assets. They may also be declared prior to the impact of an incident to protect property, public health and safety and lessen or avert the threat of a major disaster or catastrophe. Major disaster declarations are issued after an incident and constitute broader authority to help states and localities, as well as families and individuals, recover from the damage caused by the event. Fire assistance declarations provide grants to state and localities to manage fires that threaten to cause major disasters.

Recently there has been discussion that the Stafford Act should be amended to include a fourth category, generally called a "catastrophic declaration." If approved, catastrophic declarations could be invoked for high-profile, large-scale incidents that threaten the lives of many people, create tremendous damage, and pose significant challenges to timely recovery efforts.

This report examines concerns expressed by policymakers and experts that current Stafford Act declarations are inadequate to respond to, and recover from, highly destructive events, and presents the arguments for and against amending the act to add a catastrophic declaration amendment. This report also includes data analyses of past and potential disasters to determine what incidents might be deemed as catastrophic, and explores alternative policy options that might obviate the need for catastrophic declarations.

This report will be updated as events warrant.

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Introduction

Numerous studies issued by policy experts, congressional committees, the White House, federal offices of Inspector General, and the Government Accountability Office (GAO), among others, have concluded that the government response to Hurricane Katrina was subject to a variety of deficiencies that occurred at all levels of government.[1] Such deficiencies include questionable leadership decisions and capabilities, organizational failures, overwhelmed preparation and communication systems, and inadequate statutory authorities. Additionally, oversight and investigations into Gulf Coast recovery efforts has led some to conclude that federal recovery assistance has been overly bureaucratic and untimely.[2] Others have argued that the disaster declaration process "does not provide the necessary framework to manage the challenges posed by 21st century catastrophic threats."[3]

These conclusions have led to a number of reforms in federal emergency management laws and policies. For example, one proposed reform currently being contemplated by policymakers is an amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (hereinafter the Stafford Act)[4] that would add a new category of disaster declaration known as a "catastrophic declaration" for events characterized by extraordinary devastation.[5] Proponents of such a measure would argue that adding a catastrophic declaration provision could streamline response and recovery processes and/or possibly increase the amount of federal assistance provided to states and localities after large-scale disasters. Opponents, on the other hand, would argue that implementing a catastrophic declaration is not necessary and may create confusion for emergency managers and officials. States, they say, might be enticed to request a catastrophic declaration rather than a major disaster, if catastrophic declarations trigger an increased federal share of the assistance.

This report examines concerns expressed by policymakers and experts that current Stafford Act declarations are inadequate to respond to, and recover from, highly destructive events, and presents the arguments for and against amending the act to add a catastrophic declaration amendment. These arguments are framed by data analyses of past and potential disasters that

[1] For example see Richard T. Sylves, "President Bush and Hurricane Katrina: A Presidential Leadership Study," *Annals of the American Academy of Political and Social Science*, volume 604 (March 2006), pp. 26-56, U.S. Congress, Senate Committee on Homeland Security and Governmental Affairs, *Hurricane Katrina: A Nation Still Unprepared*, 109th Cong., 2nd sess., S.Rept. 109-322 (Washington: GPO, 2006); U.S. Congress, House Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina, *A Failure of Initiative: Final Report of the House Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina*, 109th Cong., 2nd sess., H.Rept. 109-377 (Washington: GPO, 2006), and the White House Homeland Security Council, *The Federal Response to Hurricane Katrina: Lessons Learned* (Washington: February 23, 2006).

[2] For example, see U.S. Congress, House Committee on Transportation and Infrastructure, Subcommittee on Economic Development, Public Buildings and Emergency Management, *Post Katrina: What it Takes to Cut the Bureaucracy and Assure a More Rapid Response After a Catastrophic Disaster*, Opening Statement of Representative Diaz-Balart, 110th Cong., 1st sess., July 27, 2009.

[3] Frances Townsend, *The Federal Response to Hurricane Katrina: Lessons Learned*, The White House, Washington DC, February 23, 2006, p. 52, http://library.stmarytx.edu/acadlib/edocs/katrinawh.pdf.

[4] P.L. 93-288, 42 U.S.C. 5721 et seq.

[5] Historic events that might qualify for a catastrophic declaration are the 1906 San Francisco earthquake and fire, the terrorist attacks of September 11, 2001, and Hurricane Katrina. A catastrophic declaration might be used for a nuclear bomb explosion, a tsunami hitting a highly populated area, or an immense and destructive earthquake, among others.

might be considered as "catastrophic." The report also explores alternative policy options that might obviate the need for catastrophic declarations.

Overview of Stafford Act Declarations

The Stafford Act is the principal authority governing federal assistance for emergencies and disasters in the United States.[6] The act authorizes the President to issue declarations that trigger federal assistance programs to help states respond to and recover from natural and human-caused incidents.[7] While the Stafford Act authorizes assistance from numerous federal agencies, the Federal Emergency Management Agency (FEMA) is the primary federal agency responsible for coordinating the federal response as well as response activities provided by other agencies and nongovernmental entities.[8]

Two organizing principles guide the declaration process. First is the preservation of the governor's discretion to request federal assistance. Second is the President's discretion to decide to issue or deny the request for federal assistance.

The President cannot issue either an emergency or a major disaster declaration without a gubernatorial request. The only exception to this rule is the authority given to the President to declare an emergency when the President "determines that an emergency exists for which the primary responsibility for response rests with the United States because the emergency involves a subject area for which, under the Constitution or laws of the United States, the United States can exercise exclusive or preeminent responsibility and authority."[9] The Stafford Act stipulates several procedural actions a governor must take prior to requesting federal disaster assistance. The governor cannot request a declaration unless he or she determines the event has overwhelmed the state's resources to such an extent that federal resources are needed.

The Stafford Act authorizes three types of presidential declarations—the proposal for a catastrophic declaration would add a fourth type of declaration. The three currently authorized by the Stafford Act include (1) Fire Management Assistance Grant Program declarations (FMAGP), (2) emergency declarations, and (3) major disaster declarations.

Fire Management Assistance Grant Program Declarations

While the President has the sole authority to issue an emergency or major disaster declaration, the determination to issue a FMAGP declaration can be rendered either by the President or FEMA.[10] A FMAGP declaration authorizes various forms of federal assistance, such as equipment,

[6] For further analysis on the Stafford Act see CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Francis X. McCarthy.

[7] For more information on emergency and disaster declarations see CRS Report RL34146, *FEMA's Disaster Declaration Process: A Primer*, by Francis X. McCarthy.

[8] For example, the Red Cross. In some cases FEMA will assign services from other federal agencies. These are called "Mission Assignments."

[9] P.L. 93-288, 42 U.S.C. Sec. 5191(b). Examples of these declarations include the April 19, 1995 bombing of the Alfred P. Murrah Building in Oklahoma City, and the September 11, 2001 attack on the Pentagon.

[10] 44 CFR 204.24.

personnel, and grants to any state or local government for the control, management and mitigation of any fire on public or private forest land or grassland that might become a major disaster.[11]

Emergency Declarations

The Stafford Act defines an emergency broadly as

> any occasion or instance for which, in the determination of the President, federal assistance is needed to supplement State and local efforts and capabilities to save lives and to protect property and public health and safety, or to lessen or avert the threat of a catastrophe in any part of the United States.[12]

Emergency declarations authorize activities that can help states and communities carry out essential services as well as activities that might reduce the threat of future damage. Emergency declarations, however, do not provide assistance for repairs and replacement of public infrastructure or nonprofit facilities.[13] Emergency declarations may be declared before an incident occurs to save lives and prevent loss. For example, emergency declarations have been declared prior to a hurricane making landfall to help state and local governments take steps (evacuation assistance, placement of response resources, etc.) that might lessen the impact of the storm and prevent a major disaster from occurring.[14]

Major Disaster Declarations

While emergencies are defined broadly, the Stafford Act defines a major disaster narrowly as:

> any natural catastrophe (including any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under this chapter to supplement the efforts and available resources of states, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby.[15]

The definition for a major disaster is more precise than an emergency declaration, and the range of assistance available to state and local governments, private, nonprofit organizations, and families and individuals is much broader. Under a major disaster declaration, state and local governments and certain nonprofit organizations are eligible (if so designated) for assistance for the repair or restoration of public infrastructure such as roads and buildings. A major disaster declaration may also include additional programs beyond temporary housing such as disaster

[11] P.L. 93-288, 42 U.S.C. Sec. 5187(a).

[12] P.L. 93-288, 42 U.S.C. Sec. 5122(1).

[13] For additional information on the differences between major disaster and emergency declarations, see CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Francis X. McCarthy.

[14] Recent examples of pre-event declarations include emergency declarations prior to Hurricanes Katrina, Rita, and Gustav making landfall (emergency declarations 3212, 3260, and 3290 respectively).

[15] P.L. 93-288, 42 U.S.C. Sec. 5122(2).

unemployment assistance and crisis counseling. A major disaster declaration may also include recovery programs such as community disaster loans.

Proposed Catastrophic Declaration

If amended, the Stafford Act might provide a declaration for what might be classified as a "mega-disaster" or "catastrophic disaster." It is unclear, however, what differentiates a disaster from a catastrophe. Moss and Shelhamer, two policy scholars who have written on the subject, state that catastrophic incidents

> by definition, tend to occur in large metropolitan regions due to the concentration of people and infrastructure. For example, a category 5 hurricane striking an undeveloped coast will generate less damage than a category 3 hurricane hitting a major city. Recent catastrophes include the 1989 Loma Prieta Earthquake (San Francisco), the 1994 Northridge Earthquake (Los Angeles), Hurricane Hugo (1989), Hurricane Andrew (1992), Hurricanes Katrina and Rita (2005), the Midwest Floods of 1993, and the September 11 attacks of 2001.[16]

The authors then recommend amending Section 102 of the Stafford Act with the language used to define a catastrophic incident in the Post-Katrina Emergency Management Reform Act of 2006 (Title VI of the Department of Homeland Security Appropriations Act, 2007—hereinafter the Post-Katrina Act).[17] The Post-Katrina Act defines a catastrophic incident broadly as

> any natural disaster, act of terrorism, or other man-made disaster that results in extraordinary levels of casualties or damage or disruption severely affecting the population (including mass evacuations), infrastructure, environment, economy, national morale, or government functions in an area.[18]

The above definition was used in the Post-Katrina Act for the purposes of improving planning documents by defining the scope of events that should be considered by the Catastrophic Incident Annex of the National Response Framework (NRF).[19] The definition was not used in the context of actual declared disasters nor was it intended to replace the definition of a major disaster in the Stafford Act.

The main difference between a catastrophic incident as defined in the Post-Katrina Act and the definition of a major disaster in the Stafford Act is that the former focuses on the event's scope, impact, and severity. In general, a catastrophic incident would carry far-reaching consequences beyond a state's borders and have national implications including the economy, infrastructure, and even national psyche. In contrast, the major disaster definition generally focuses more on categorizing causes that potentially overwhelm states and localities.

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[16] Mitchell L. Moss and Charles Shellhamer, *The Stafford Act and Priorities for Reform*, The Center for Catastrophe Preparedness & Response, New York University, p. 14.

[17] P.L. 109-295, Department of Homeland Security Appropriations Act, 2007. 120 STAT. 1395-1463.

[18] 6 U.S.C. 701(4).

[19] The NRF is the United States' core emergency and disaster response document. The Catastrophic Incident Annex is a companion document explicating response activities in the event of a catastrophic incident such as a large hurricane. For further analysis on the NRF, see CRS Report RL34758, *The National Response Framework: Overview and Possible Issues for Congress*, by Bruce R. Lindsay.

Supporters of catastrophic declarations argue that while "routine disasters" can be managed through major disaster declarations, large-scale, destructive incidents warrant their own type of declaration because they pose unique challenges inadequately addressed by major disaster declarations. Examples of such challenges may include

- The President can declare an emergency without a gubernatorial request, if he considers the event to be primarily a federal responsibility, but must wait for a gubernatorial request for most emergencies and all major disasters.[20] The wait for a request could delay the federal response, or federal assistance, or both.
- The response and recovery efforts associated with large-scale disasters involve multiple federal agencies that require higher levels of leadership to resolve potential inter-agency conflicts, and effectively coordinate and manage response and recovery efforts.
- Current response and recovery procedures for major disasters are too cumbersome for large-scale disasters because the procedures are too rigid and inefficient to provide assistance at an accelerated rate.
- Some argue that federal assistance is needed more quickly after large-scale, destructive incidents than routine disasters—the disbursal of assistance provided through a major disaster declaration is too slow to meet recovery needs.
- Due to the enormous amount of destruction and the economic impacts caused by large-scale disasters, many states and localities are unable to pay their portion of the cost-share.

The following section describes how a catastrophic declaration might address these challenges.

Potential Uses and Benefits of a Catastrophic Declaration

A catastrophic declaration may be used to trigger certain mechanisms before, during, and after a catastrophe. Policymakers might also elect to apply a catastrophic declaration to one or more phases of the incident.

Prior to an Incident

The Catastrophic Incident Annex of the NRF states federal resources and assets may be deployed prior to a catastrophic incident in anticipation of a request from state, tribal, and local governments that an imminent disaster appears to threaten human health and safety.[21] Such activities may include the placing of resources to reduce the impact of the incident and improve response capabilities, pre-positioning of emergency and disaster employees and supplies, monitoring the status of the situation, communicating with state emergency officials on potential

[20] 44 CFR 206.35(d).

[21] Federal Emergency Management Agency, *Catastrophic Incident Annex*, Washington DC, November 2008, p. 2, http://www.fema.gov/pdf/emergency/nrf/nrf_CatastrophicIncidentAnnex.pdf.

assistance requirements, and deploying teams and resources to maximize the speed and effectiveness of the anticipated federal response.

As mentioned previously, under certain conditions the Stafford Act authorizes federal support in the absence of a gubernatorial request to "save lives, prevent human suffering, or mitigate severe damage." If Congress chose to create a catastrophic declaration, it might elect to amend Section 402 to provide the President with similar authority so as to trigger federal activities such the ones described above. Additionally, the amendment could be designed to signal the immediate deployment of federal strike teams and surge capacity forces.[22] Alternatively, some may argue the Stafford Act could be amended to authorize the aforementioned precautionary measures for major disasters without a catastrophic declaration.

During an Incident

The NRF provides the guiding principles for a unified response by assigning roles and responsibilities to all levels of government, nongovernmental organizations, the private sector, communities, and communities to all types of hazards regardless of their origin. The unified response is executed through supporting documents known as annexes: Emergency Support Functions (ESF) Annexes and Incident Annexes.[23]

ESFs group federal agencies by their resource and function related to a particular incident. For example, all federal agencies that play a role in the response and recovery of an oil spill are listed in ESF #10. The ESF's function is to designate lead and supporting federal agencies responsible for incident response and recovery.

Similar to an ESF, Incident Annexes group agencies by matching their resources and functions to a particular incident. Incident Annexes also designate lead and support agencies. For example, federal agencies responsible for response and recovery from a biological attack are listed in the Biological Incident Annex. Incident Annexes differ from an ESF, however, because the incidents they address have been deemed to require specialized response and recovery activities specific to the incident.

Response and recovery efforts carried out under each ESF and Incident Annex are executed through various operational plans. Proponents would argue that a catastrophic declaration could be used to trigger streamlined procedures within these operational plans. They may further argue that catastrophic incidents create tremendous uncertainty and that bureaucratic protocols exacerbate this uncertainty and hinder efforts aimed at a timely response. Thus, streamlining procedures might provide flexibility to operational plans and promote autonomous decision-making.

[22] P.L. 109-295, Sec. 602, 120 STAT. 1395(15). The Post-Katrina Act defines surge capacity as "the ability to rapidly and substantially increase the provision of search and rescue capabilities, food, water, medicine, shelter and housing, medical care, evacuation capacity, staffing (including disaster assistance employees), and other resources necessary to save lives and protect property during a catastrophic incident."

[23] There are 15 ESFs and seven Incident Annexes. See http://www.fema.gov/emergency/nrf/mainindex.htm. For further analysis on the NRF Annexes, see CRS Report RL34758, *The National Response Framework: Overview and Possible Issues for Congress*, by Bruce R. Lindsay.

On the other hand, some may argue that, while intuitively appealing, providing additional flexibility during a catastrophic declaration might produce a chaotic federal response because operational plans among federal agencies are tightly coupled with each other. Deviation in response by one agency could have negative rippling effects that could hinder the response of other agencies.

After an Incident

A catastrophic declaration could be used to automatically alter aspects of recovery polices and regulations. Such a declaration could have triggers that would cause a change in the percentage of federal resources as well as adjusting the delivery system of traditional disaster relief programs. The following recovery strategies might be included in the event of a catastrophic declaration.

- The catastrophic declaration could automatically increase the federal cost-share to lessen the economic impact states and localities incur from catastrophic incidents. The Stafford Act provides that the federal share for the repair, restoration, and replacement of damaged facilities "shall be not less than 75%."[24] A catastrophic declaration could be used to automatically increase the federal share to 90% or perhaps 100%. Moreover, the 72-hour window of 100% funding for immediate federal aid could be extended for a longer period. Early knowledge of such adjustments may accelerate state and local activity because foreknowledge of the adjustment provides states and localities with an assurance of fiscal relief which would then encourage them to act quickly to accomplish necessary repairs and begin comprehensive recovery planning. However, these adjustments can add significantly to the overall cost of the disaster.[25]
- A catastrophic declaration could trigger a number of changes to recovery programs that could speed assistance and provide increased flexibility. Some of these changes could include the delivery of block grants to states to handle immediate needs and begin infrastructure repairs. An alternative would be for a catastrophic event to (1) switch on "gap funding" which provides timely front-end funding to states and localities to cover initial efforts; (2) make straight-time force[26] account labor (for disaster work) by state and local governments eligible for reimbursement; (3) automatically increase funding caps for the Community Disaster Loan (CDL) program;[27] and (4) provide clear authority and resources to FEMA and its federal partners for long-term recovery efforts in partnership with state and local governments.
- Once declared, catastrophic declarations could trigger certain congressional rules that might prevent potential deadlock over the passage of disaster relief funds for disaster-stricken communities.

[24] P.L. 93-288, 42 U.S.C. Sec. 5170b, Sec. 5172, and Sec. 5173.

[25] For additional information on the cost-share issue see CRS Report R41101, *FEMA Disaster Cost-Shares: Evolution and Analysis*, by Francis X. McCarthy.

[26] Straight-time force would provide the state funds to pay all labor costs, rather than only overtime costs. See C.F.R. Title 44—Emergency Management and Assistance.

[27] Currently capped at $5 million per community. See 44 C.F.R. 360.361(b). That cap was removed for Special Katrina loans.

On the other hand, it could be argued that the Stafford Act could be amended to make these changes part of a major disaster declaration.

Analysis of Congressional Action After the Incident

Part of the argument for a catastrophic declaration is that it could provide immediate financial assistance on a broader scale without having to await congressional approval for additional federal assistance through a supplemental appropriation. An examination of the record, however, demonstrates that congressional action on emergency supplemental funding in the wake of large disasters has grown more rapid in recent years (see **Table 1**).

Table 1. Emergency Supplemental Funding for Large Disasters

Event	Date of Declaration	Congressional Action	Days
Hurricane Katrina	August 29, 2005	September 2, 2005	3
Hurricane Isabel	September 18, 2003	September 30, 2003	12
9/11 Terrorist Attacks	September 11, 2001	September 18, 2001	7
Nisqually Earthquake	March 1, 2001	July 24, 2001	114
Hurricane Floyd	September 16, 1999	October 20, 1999	34
Northridge Earthquake	January 17, 1994	February 12, 1994	26
Midwest Floods	June 11, 1993	August 12, 1993	62
Hurricane Andrew	August 23, 1992	September 23, 1992	31
Hurricane Hugo	September 20, 1989	September, 29, 1989	9

Source: CRS Report R40708, *Disaster Relief Funding and Emergency Supplemental Appropriations*, by Bruce R. Lindsay and Justin Murray.

Note: Table 1 reflects the number of days it took to enact the first supplemental appropriation. Some incidents (such as Hurricane Katrina) received more than one supplemental appropriation for disaster relief.

It could be argued that Congress has acted expeditiously. On average, Congress has passed supplemental appropriations for disaster assistance within 33 days of the disaster declaration. It can also be argued that while resources may be provided relatively quickly for routine disasters, catastrophic incidents require an accelerated timeframe to provide adequate assistance. In addition, the results of this analysis indicate that Congress has been responsive to the largest and most devastating incidents. In some cases, disaster assistance was enacted within one week of the declaration. Moreover, while it took longer than 30 days to enact some supplemental appropriations, the incidents for which the funding was enacted generally had fewer damages than the larger, more expensive disasters.

The reaction to the devastation caused by the 2005 hurricane season resulted in historic amounts of disaster response and recovery funding. Along with the amount of resources provided by Congress, it could be argued that the Stafford Act is a very flexible instrument that provides broad authority for various forms of assistance. The reluctance or inability of some to administer these authorities in the past does not eliminate their existence or the possible help that can be derived from those broad authorities under any disaster declaration. Authorities such as Section 402 of Stafford for "General Federal Assistance" and Section 403 for "Essential Assistance" provide

FEMA the discretion to use various forms of federal help or to supplement state help to achieve disaster response and recovery goals.[28]

Analysis of Catastrophic Events Past and Future

This section analyzes incidents that might be deemed as catastrophic to help frame a debate concerning the need and desirability of amending the Stafford Act to include a catastrophic declaration. Because catastrophic incidents are generally characterized as events that cause extraordinary damage, or loss of life (or both), the following analysis is based on data from past, large-scale incidents that have occurred in the United States, as well as data derived from studies that predict damage levels and loss of life for large-scale disasters that could happen in the future (see **Table 2**). [29]

This report incorporates a method known as the value of statistical life (VSL) to assign a monetary value to each fatality caused by the given incident.[30] VSL helps compare incidents with many fatalities and little damage (such as the Chicago Heat Wave of 1995) to incidents that caused significant damages, but had few, or no, fatalities (such as the Love Canal incident in 1978).

This section of the report is divided into four subsections that rank incidents according to the following: (1) previous large-scale disasters by estimated damage costs; (2) previous large-scale disasters by estimated damage and VSL costs; (3) previous large-scale disasters and potential incidents by damage costs; and (4) previous large-scale disasters and potential incidents by estimated damage and VSL costs.

The percentiles used for this analysis are derived by multiplying the costliest incident in the subsection by a given percentile.[31] It should be noted that the data used for this analysis are subject to variations and limitations (see "Caveats and Methodology").

[28] 42 U.S.C. 5170a and 5170b.

[29] The 1919 Influenza Pandemic is included in **Table 2** but is not included the analysis because the incident skews the results. See "Caveats and Methodology".

[30] As part of an economic analysis required by Executive Order 12866, the issuing agencies often place the monetary value on expected health benefits by determining the number of "statistical lives" that the rules are expected to extend or save, and then multiplying that number by an estimated "value of a statistical life." For further analysis on how agencies monetize statistical lives see CRS Report R41140, *How Agencies Monetize "Statistical Lives" Expected to Be Saved By Regulations*, by Curtis W. Copeland.

[31] For example, in terms of damages alone, the 1871 Chicago Fire was the costliest disaster in the United States ($168 billion). Thus, to determine the 90th percentile the following formula was used: $168,000,000,000 x 0.90 = $151,200,000,000. The formula for the 80th percentile was: $168,000,000,000 x 0.80 = $134,400,000,000, and so on.

Table 2. Previous and Potential Catastrophic Incidents, Through 2008

(2010 dollars)

Disaster	Fatalities	Value of Statistical Life (VSL)	Damage Estimate	Combined VSL and Damage Estimate
1871 Chicago Fire	300	1,800,000,000	168,000,000,000	169,800,000,000
1900 Galveston Hurricane	9,000	54,000,000,000	700,000,000	54,700,000,000
1906 San Francisco Earthquake	3,000	18,000,000,000	9,579,792,048	27,579,792,048
1919 Influenza Pandemic	675,000	4,050,000,000,000	0	4,050,000,000,000
1929 Great Mississippi Flood	1,000	6,000,000,000	2,899,905,508	8,899,905,508
1964 Alaska Earthquake/Tsunami	131	786,000,000	311,000,000	1,097,000,000
1969 Hurricane Camille	256	486,000,000	1,421,000,000	1,886,000,000
1965 Hurricane Betsy	81	1,536,000,000	1,400,000,000	2,957,000,000
1974 Xenia (Easter) Tornado Outbreak	330	1,980,000,000	1,000,000,000	2,980,000,000
1978 Love Canal	0	0	400,000,000	400,000,000
1980 Mount St. Helens	57	342,000,000	1,000,000,000	1,342,000,000
1989 Loma Prieta Earthquake	63	342,000,000	10,000,000,000	7,342,000,000
1992 Hurricane Andrew	23	378,000,000	27,000,000,000	10,378,000,000
1995 Chicago Heat Wave	525	138,000,000	0	27,138,000,000
1989 Hurricane Hugo	57	360,000,000	7,000,000,000	20,360,000,000
1994 Northridge Earthquake	60	3,150,000,000	20,000,000,000	3,150,000,525
2001 September 11th Terrorist Attacks	2,978	17,868,000,000	42,600,000,000	60,468,000,000
2005 Hurricane Katrina	1,833	10,998,000,000	148,000,000,000	158,998,000,000
2008 Hurricane Ike	20	120,000,000	19,300,000,000	19,420,000,000
ARkStorm[a]	1,000	6,000,000,000	400,000,000,000	406,000,000,000
New Madrid Earthquake[b]	85,000	510,000,000,000	120,000,000,000	630,000,000,000
Southern San Andreas Fault Earthquake[b]	1,800	10,800,000,000	200,000,000,000	210,800,000,000

Source: Data derived from supplemental appropriations and government studies and reports. See the **Appendix** for a full list of the sources used for this table.

a. ARkStorm is a hypothetical flood disaster that could occur (see footnote 35).

b. Denotes a hypothetical earthquake that could occur (see **Appendix**).

Previous Incidents with Extraordinary Damages

This subsection ranks some of the costliest incidents to ever occur in the United States in the past 140 years (**Table 3**). Assuming catastrophic incidents are the most expensive events, then the following conclusions could be drawn: If the 90th percentile ($151 billion or more in damages) of incidents are catastrophic, then only the 1871 Chicago Fire would qualify as a catastrophic incident. If the 80th percentile ($134 billion or more in damages) of incidents are catastrophic, only the 1871 Chicago Fire and Hurricane Katrina would qualify as catastrophic incidents. These would remain constant until the 20th percentile ($34 billion or more in damages), which would then include the September 11, 2001 terrorist attacks. The remaining incidents fall below the 20th percentile.

Table 3. Prior Large-Scale Disasters by Damage Estimate, through 2008

(2010 dollars)

Disaster	Damage Estimate	Rank
1871 Chicago Fire	168,000,000,000	1
↑ 90th Percentile (≥ $151 billion) ↑		
2005 Hurricane Katrina	148,000,000,000	2
↑ 80th Percentile (≥ $134 billion) ↑		
2001 September 11th Terrorist Attacks	42,600,000,000	3
↑ 20th Percentile (≥ $34 billion) ↑		
1992 Hurricane Andrew	27,000,000,000	4
1994 Northridge Earthquake	20,000,000,000	5
2008 Hurricane Ike	19,300,000,000	6
1989 Loma Prieta Earthquake	10,000,000,000	7
1906 San Francisco Earthquake	9,579,792,048	8
1989 Hurricane Hugo	7,000,000,000	9
1929 Great Mississippi Flood	2,899,905,508	10
1969 Hurricane Camille	1,421,000,000	11
1965 Hurricane Betsy	1,400,000,000	12
1974 Xenia (Easter) Tornado Outbreak	1,000,000,000	13
1980 Mount St. Helens	1,000,000,000	14
1900 Galveston Hurricane	700,000,000	15
1978 Love Canal	400,000,000	16
1964 Alaska Earthquake/Tsunami	311,000,000	17

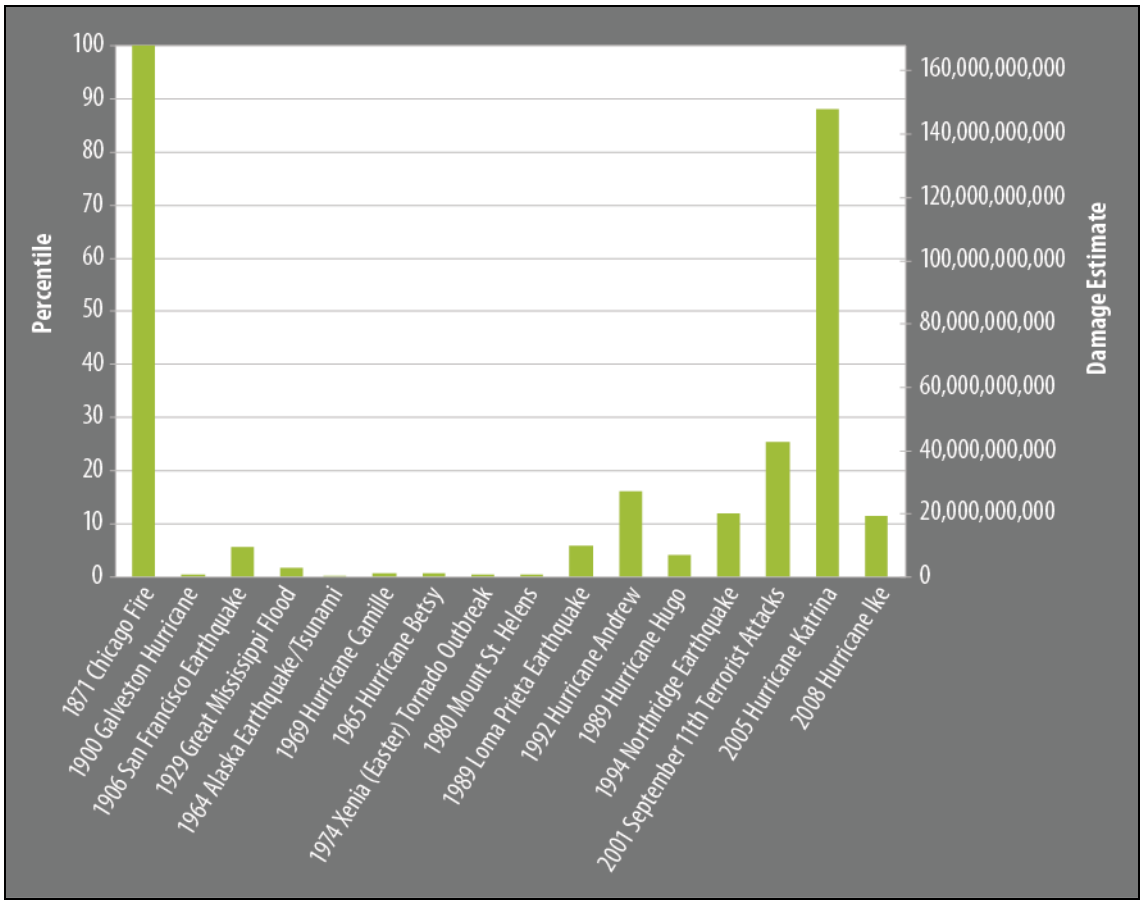
Source: Data derived from supplemental appropriations and government studies and reports. See **Appendix.** sources for a full list of the sources used for this table.

Methodology: $168,000,000,000 x 0.90 = $151,200,000,000, $168,000,000,000 x 0.80 = $134,400,000,000, and $168,000,000,000 x 0.20 = $33,600,000,000. Some figures have been rounded. The 1995 Chicago Heat Wave is not included in **Table 3**.

Figure 1 presents the same data in chronological order. Again, assuming catastrophic incidents are the most expensive events, then the following conclusions could be drawn: over 130 years has elapsed between the most expensive incident (the 1871 Chicago Fire) and the second and third most expensive incidents (Hurricane Katrina, and the September 11, 2001 terrorist attacks, respectively). However, many of the most expensive disasters have occurred in more recent times. In the last 30 years, at least six incidents that had damages of $10 billion or more have occurred, and in the last 16 years, at least five incidents that had damages of $19 billion or more have occurred.

Figure 1. Previous Large-Scale Disasters by Damage Estimate, through 2008

(2010 dollars)



Source: Data derived from supplemental appropriations and government studies and reports. See the **Appendix** for a full list of the sources used for this figure.

Methodology: See methodological description in **Table 3**.

Given the number of large-scale disasters occurring in the last 30 years, one might conclude that large-scale disasters are occurring more frequently—which might support an argument for a catastrophic declaration. A counterargument, on the other hand, is that in terms of damage costs, only Hurricane Katrina truly qualifies as a catastrophic event when compared to other, recent incidents. It might be further argued that while many of the most expensive disasters have occurred in recent years, the increased costs associated with such incidents are a function of variables that are not necessarily related to the magnitude of the incidents (such as increased federal expenditures for assistance and recovery projects, the replacement of expensive

infrastructure, and the development of previously uninhabited areas). Consequently, opponents of a catastrophic declaration might conclude that damage costs are not a suitable determinant for assessing the need for the new declaration because it fails to address the response and recovery issues previously discussed in this report.

Previous Incidents by VSL and Damage Costs

Table 4 lists the same incidents presented in **Table 2** ranked according to combined VSL and damage costs. Assuming that catastrophic incidents are incidents with the highest combined VSL and damage costs, then the following conclusions could be drawn: If the 90th percentile ($153 billion or more) of incidents are catastrophic, then the 1871 Chicago Fire and Hurricane Katrina would qualify as catastrophic incidents. These events would remain singular until the 30th percentile ($51 billion or more) in which the September 11th terrorist attacks and the 1900 Galveston Hurricane would then also qualify as catastrophic. The 1906 San Francisco Earthquake and Fire, the 1995 Chicago Heat Wave, the 1989 Hurricane Hugo, and 2008 Hurricane Ike would all be deemed catastrophic if the 20th percentile were used ($17 billion or more) for the determination.

Table 4. Previous Large-Scale Disasters by Combined VSL and Damage Estimates

(2010 dollars)

Disaster	Combined VSL and Damage Estimate	Rank
1871 Chicago Fire	169,800,000,000	1
2005 Hurricane Katrina	158,998,000,000	2
↑ 90th Percentile (≥ $153 Billion) ↑		
2001 September 11th Terrorist Attacks	60,468,000,000	3
1900 Galveston Hurricane	54,700,000,000	4
↑ 30th Percentile (≥ $51 Billion) ↑		
1906 San Francisco Earthquake	27,579,792,048	5
1995 Chicago Heat Wave	27,138,000,000	6
1989 Hurricane Hugo	20,360,000,000	7
2008 Hurricane Ike	19,420,000,000	8
↑ 20th Percentile (≥ $17 Billion) ↑		
1992 Hurricane Andrew	10,378,000,000	9
1929 Great Mississippi Flood	8,899,905,508	10
1989 Loma Prieta Earthquake	7,342,000,000	11
1994 Northridge Earthquake	3,150,000,525	12
1974 Xenia (Easter) Tornado Outbreak	2,980,000,000	13
1965 Hurricane Betsy	2,957,000,000	14
1969 Hurricane Camille	1,886,000,000	15
1980 Mount St. Helens	1,342,000,000	16

Disaster	Combined VSL and Damage Estimate	Rank
1964 Alaska Earthquake/Tsunami	1,097,000,000	17
1978 Love Canal	400,000,000	18

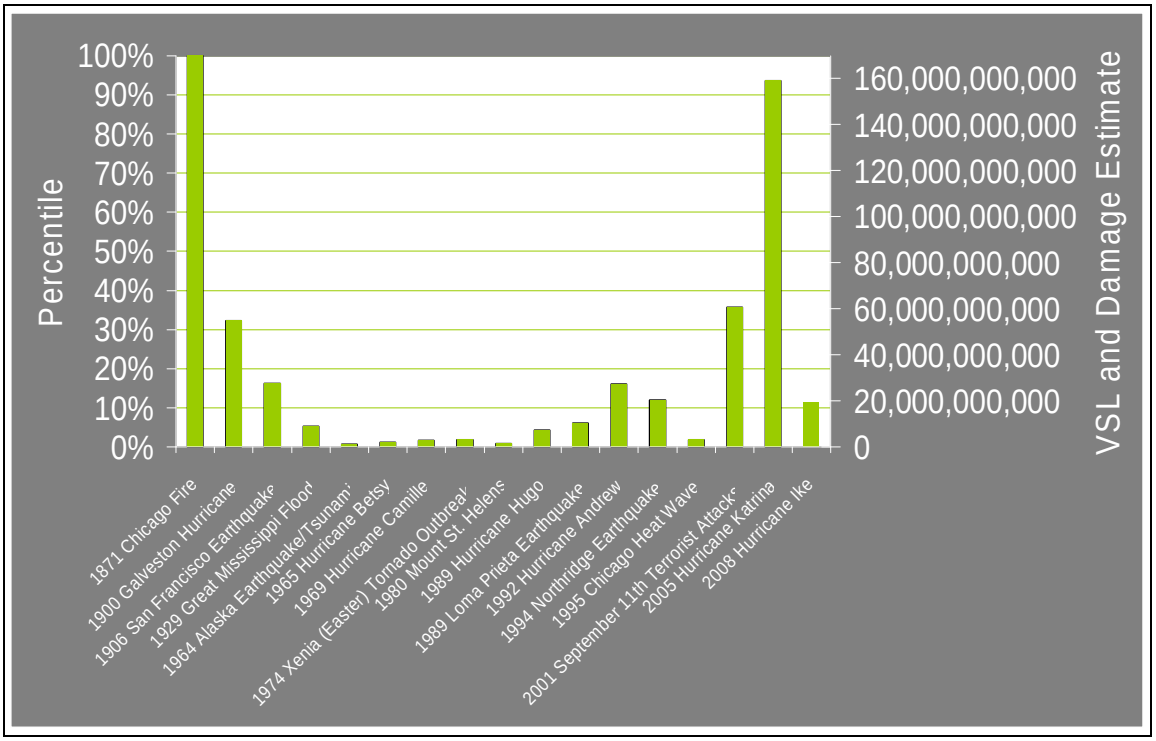
Source: Data derived from supplemental appropriations and government studies and reports. See the **Appendix** for a full list of the sources used for this table.

Methodology: $169,800,000,000 x 0.90 = $152,820,000,000, $169,800,000,000 x 0.30 = $50,940,000,000, and $169,800,000,000 x 0.10 = $16,980,000,000. Some figures have been rounded.

Figure 2 presents the data from **Table 4** in chronological order. Using the above VSL and damage cost assumptions from above to examine large-scale incidents over the past 140 years, the analysis suggests that approximately 100 years has elapsed between the highest ranked disaster (the 1871 Chicago Fire) and the second highest ranked disaster (Hurricane Katrina).

Figure 2. Previous Large-Scale Disasters by Combined VSL and Damage Estimates, Through 2008

(2010 dollars)



Source: Data derived from supplemental appropriations and government studies and reports. See the **Appendix** for a full list of the sources used for this figure.

Methodology: See the methodological description in **Table 4**.

Additionally, whereas this analysis on damage costs alone might indicate that the "worst" disasters have occurred within the last 30 years, some might conclude that combining VSL with damage costs tends to support the opposite conclusion—that the worst disasters occurred around the turn of the century. Based on the latter conclusion, some may question the need for catastrophic declarations for contemporary incidents. On the other hand, others may argue that

recent incidents should still be taken into consideration when evaluating the need for catastrophic declarations. This is because two of the four highest ranked disasters have occurred within the last ten years.

Disasters Past and Future

When the analysis is extended to capture all of the incidents in **Table 2**,[32] the inclusion of potential disasters changes the order of percentile rankings. However, the number of incidents meeting certain catastrophic thresholds remains low.

In terms of damage costs alone, if one assumes catastrophic incidents are the most expensive events, then the following conclusions could be drawn: If the 90th percentile ($360 billion or more) of incidents are catastrophic, then only the hypothetical "ARkStorm" would qualify as a catastrophic incident. This event would remain singular until the 50th percentile ($200 billion or more) in which the hypothetical Southern San Andreas Fault Earthquake would also qualify as catastrophic. If the catastrophic incident threshold includes incidents in the 40th percentile ($160 billion or more) or higher, then the 1871 Chicago Fire would be included as catastrophic. [33]

When the highest combined VSL and damage costs are included, the following conclusions could be drawn: If the 90th percentile ($567 billion or more) of incidents are catastrophic, then only the New Madrid Earthquake scenario would qualify as a catastrophic incident. This event would remain singular until the 60th percentile ($378 billion or more), in which the ARkStorm would be considered catastrophic. The 30th percentile would include the Southern San Andreas Fault Earthquake Scenario. All of the remaining incidents fall under the 10th percentile range ($63 billion or more).[34]

Summary of Analysis and Policy Implications

Upon reviewing the results of the comparative analysis of destructive incidents, it could be argued that highly destructive events occur too rarely to warrant a catastrophic declaration. In terms of damage estimates alone, only one incident exceeds the 90th percentile benchmark, and only two would qualify if the 80th percentile is used as a benchmark (the 1871 Chicago Fire and Hurricane Katrina). In addition, these events are separated by over 130 years.

Similar conclusions might be drawn on the comparative analysis of combined VSL and damage estimate costs—specifically, that high-impact events are too infrequent to merit the addition of a new declaration category—only two incidents in the last 100 years meets the 90th percentile threshold—and these incidents are over 100 years apart from each other. Additionally, the threshold would have to be adjusted to the 30th percentile to include more than two incidents. Critics of the additional declaration might further argue that VSL is a poor determinant for a

[32] Excluding the 1919 Influenza Pandemic as an outlier.

[33] Methodology: $400,000,000,000 x 0.90 = $360,000,000,000, **$**400,000,000,000 x 0.50 = $200,000,000,000, and $400,000,000,000 x 0.40 = $160,000,000,000.

[34] Methodology: $630,000,000,000 x 0.90 = $567,000,000,000, $630,000,000,000 x 0.60 = **$**378,000,000,000, and $630,000,000,000 x 0.10 = $63,000,000,000. The 1919 Influenza Pandemic is included in **Table 2** but is not included in the analyses because the incident skewed the results. See "Caveats and Methodology."

catastrophic declaration because federal assistance is predominately tied to recovery projects rather than victim or survivor compensation.

With regard to recent disaster activity, proponents who support the addition of a catastrophic declaration could argue that, in terms of damage estimates, 8 of the top 18 incidents have occurred within the last 30 years. However, in terms of combined VSL and damage estimate costs, two of the top four incidents have occurred within the last 10 years. To some, this may be taken as an indication that catastrophic incidents are increasing in frequency. They may also argue that future disasters might be more destructive due to increases in population, development, and infrastructure. Thus, they might argue the scope of this analysis should be limited to more recent incidents. Proponents who support the addition of a catastrophic declaration could also argue that the analysis fails to take into account potential future incidents.

While opponents of a catastrophic declaration might conclude that this analysis demonstrates that catastrophic incidents are too rare to warrant a new type of declaration, supporters might make the claim that the damage and VSL costs portrayed in this analysis would have been reduced if carried out according to the provisions provided under a catastrophic declaration.

Caveats and Methodology

The data sources for the above analyses have been assembled from multiple governmental sources and are listed in the **Appendix**. As mentioned previously, the data on fatalities and damages from these sources are subject to variation and should not be viewed as definitive. Additionally, many studies report death tolls in ranges for various incidents. For the purposes of this report, the average number between the range was used as a fatality figure. The hypothetical scenarios used for the analyses do not represent the universe of possible incidents—such as a nuclear detonation, an asteroid incident, or another influenza pandemic.

There were also some reporting anomalies. The United States Geological Survey (USGS) ARkStorm scenario study did not provide a fatality estimate.[35] For the purposes of this report, the number of fatalities from the 1929 Mississippi flood was used because reporting no deaths produced outlying figures that skewed the data results. Similarly, the 1919 Influenza Pandemic was eliminated from the analyses because the number of fatalities (675,000) produced an outlying figure that skewed the data results.

The comparative analysis spans over a century and the incident computations reported in the analyses do not reflect increases in development, infrastructure, and populations that would have made earlier incidents more costly were they to occur in this period of time. The computations in this report do not reflect current mitigation and response mechanisms that might have decreased the impacts of previous events had they been available.

VSL computations vary among federal agencies from roughly $5 million to $10 million per individual. While FEMA does not use a VSL computation, the Department of Homeland Security (DHS) uses a VSL of $6 million per individual for certain attack scenarios. The VSL value used by DHS was used for this report.

[35] The ARkStorm is a hypothetical study conducted by the USGS that combines prehistoric flood history in California with modern flood mapping and climate-change projections to produce a hypothetical but, according to the USGS, plausible disaster scenario. See http://pubs.usgs.gov/of/2010/1312/ for an overview of the scenario.

As mentioned previously, damage costs are not the sole determinant for disaster declarations. The purpose of these analyses is to develop a model to determine which incidents could be deemed as catastrophic based on damages and VSL costs. Other considerations, such as potential economic or social impacts of the incidents are not reflected in the analyses. Statistically reliable forecasts of the occurrence of future events based on this data could not be completed due to insufficient data points.

The data presented in this report are not definitive and should be interpreted with care before drawing any conclusions.

Summary of Potential Implications

Potential Benefits of a Catastrophic Declaration

Depending on its design, certain benefits may be derived from using a catastrophic declaration for large-scale disasters, including

- accelerated and more robust federal assistance to states prior to an incident,
- the use of specialized response plans and guidelines for the federal response,
- the elimination or reduction of procedures and protocols that might impede response and recovery activities and efforts,
- the elimination or reduction of procedures and protocols that might delay the disbursal of federal assistance, and
- increasing the amount of federal assistance through various mechanisms to help states recovery more quickly and avoid economic hardship.

Potential Drawbacks of a Catastrophic Declaration

The potential drawbacks of a catastrophic declaration may include

- unclear authority and responsibility designations could confuse those responsible for executing the response and recovery,
- increased federal costs for disaster assistance due to increased declaration activity,
- increased federal costs for disaster assistance due to the increased federal cost-share provisions included with the declaration, and
- increased federal involvement and responsibility for incident response.

Further Considerations

Some may argue that the Stafford Act's broad definition of an emergency lacks sufficient specific criteria and provides the President with too much discretion to determine which incidents are emergencies. This, in turn, may have increased the federal role (and by extension—the amount of

federal expenditures for disaster assistance) in emergency assistance through declaration "creep." Critics assert that once an incident qualifies as an emergency, the odds are improved that a similar incident in the future will be declared as an emergency. The Post-Katrina Act also uses a broad definition to define a catastrophe. It could be argued that the addition of a broad definition of a catastrophe could also lead to declaration "creep" of major disasters.

The use of an arithmetical formula or sliding scale based on income or population to declare a major disaster or an emergency is precluded by Section 320 of the Stafford Act. Amending the Stafford Act to include a catastrophic declaration would be presumably be subject to the same limitation—unless the amendment requires some form of measurable criteria to be applied.

One method that could be used to keep assistance costs down is legislative language that allows a catastrophic declaration to be downgraded to a major disaster if it was determined that damages did not merit a catastrophic declaration. Downgrading a catastrophic declaration, however, may appear indecisive and create confusion.

Another consideration involves aspects of politics more than policy. It may be difficult for the President to deny a request for a catastrophic declaration because the President might be seen as failing to properly respond to a calamitous event—even if it were declared a disaster.

The predecessor to the NRF, the National Response Plan (NRP) contained guidelines for an "Incident of National Significance" which was intended as a triggering mechanism for various levels of response activities. It was eliminated however, because the designation caused confusion during the Hurricane Katrina response—primarily because the designation established a different leadership structure than was commonly used for "routine" disasters.[36] One the one hand, a catastrophic declaration could be designed to trigger a chain of command structure consisting of higher levels of leadership and rank to address the catastrophe. On the other hand, altering the command structure could create conflicts and confusion because it may be unclear as to who is in charge of the incident. Similarly, a catastrophic declaration designed to alter the response in some manner could also create additional layers of bureaucracy that impede or hinder the response.

Some may argue a catastrophic incident would not receive unique resources that are not already authorized and provided for a major disaster declaration. If this is the case, one might question the need for catastrophic declarations.

A full federal cost-share, if included in a catastrophic declaration, might tempt states to request a catastrophic declaration to increase the amount of federal assistance provided for the incident. If that became the case, a catastrophic declaration would incentivize requests for the declaration and drive up the costs of federal funding for disaster relief.

Natural disasters on a truly catastrophic scale, such as the San Francisco earthquake and fire of 1906 and Hurricane Katrina, are infrequent, and might be called "100-year events." If used for such events the declaration might not be put to use for an extended period of time. If a catastrophic declaration is used infrequently, it might become antiquated over time and fail to meet the needs of the incident. Furthermore, infrequent use of the declaration could create confusion because lawmakers and officials may have to become reacquainted with the declaration

[36] For similar problems regarding the role of the Federal Coordinating Officer (FCO) and the Principal Federal Official (PFO), see CRS Report RL34758, *The National Response Framework: Overview and Possible Issues for Congress*, by Bruce R. Lindsay.

before applying its provisions. Thus, it could be argued that these incidents would be better handled through special legislation on an as-needed basis.

Potential Alternatives to a Catastrophic Declaration

Perhaps the strongest rationale for the development of a catastrophic declaration grew out of the Hurricane Katrina response and recovery experience which began in 2005 and now, nearly six years later, is still the focus of debate and the template for legislative attempts aimed at improving response and recovery.

While considering the possible changes and improvements that could potentially be a part of a catastrophic declaration, reviewing the changes that have been made since the Katrina disaster could be useful.

The Post-Katrina Act made some significant changes to the Stafford Act. Since the changes were not retroactive and could not be applied to the Katrina disaster, the actual program adjustments have not been fully tested. These changes include

- **The authority to provide case management for disaster victims.**[37] This change provides assistance for a major disaster where large numbers of people may be displaced and need help in understanding the assistance that is available, and to connect people, particularly those with special needs, with other forms of help from both public and private sources.
- **Removal of the $5,000 cap on home repairs to make a home habitable**.[38] Under the Disaster Mitigation Act of 2000, home repairs were limited to $5,000 with the remainder of work to be accomplished with a Small Business Administration disaster loan, assuming an applicant qualified for the loan. Since the Post-Katrina Act, repairs can be done for up to the maximum amount available under the Individuals and Households Program (IHP).[39]
- **Pilot Program for Public Assistance (PA).** The PA pilot program accelerated debris removal at the local level by permitting payment of straight time wages to government employees involved in debris removal work and encouraged local communities to have a debris removal plan in place by decreasing the state and local share by 5% of costs (from 25% to 20%).[40] This authority expired in 2008. FEMA intends to develop regulations to implement provisions of the PA pilot. This would include a public comment period and related parts of the rule-making process. While FEMA considers this "a priority of the Agency" it has not yet determined a timeframe for publication of the proposed rule.[41]

[37] 42 U.S.C. 5189d.

[38] P.L. 109-295, 120 Stat. 1448.

[39] Originally set at $25,000, with Consumer Price Index adjustments, the total amount available to households under IHP is now in the $30,000 range. SBA loans can be for up to $200,000 for the repair of primary homes.

[40] P.L. 109-295, 120 Stat. 1455.

[41] E-mail to the author from Ted Litty, Senior Policy Advisor, Response and Recovery, Federal Emergency Management Agency, Department of Homeland Security, May 18, 2011.

- **Pilot Program for Individual Assistance (IA).** This pilot program permitted FEMA to make repairs on privately owned rental units to increase the available housing stock after a disaster event.[42] Reports by FEMA indicate that this was a successful program that decreased temporary housing costs in comparison to other housing alternatives. The authority for the program expired on December 31, 2008. As with the PA Pilot, FEMA released a report two years ago on the IHP pilot program. The report concluded that "Analysis and recommendations on additional authorities will be provided at a later date."[43] FEMA now has determined that "through our existing authority, that we may repair multi-family rental housing units for use by disaster survivors. We expect to implement this authority in future disasters, as appropriate."[44]

Taken together, these changes to Stafford created a more flexible framework that can more easily be scaled up to meet the needs of extraordinary events. However, as the discussion of adding a catastrophic declaration attests, there is considerable debate concerning whether additional changes are necessary to increase FEMA's ability to assist state and local governments and individuals and families affected by disasters.

[42] P.L. 109-295, 120 Stat. 1454.

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