Eroding Long-Term Prospects for Florida's Beaches: Florida's Coastal Management Policy

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Executive Summary

Florida's beaches—and the sea turtles that depend on them—are at risk. Ever-increasing erosion, coastal development, armoring, storms, and rising sea levels threaten to create the perfect storm capable of squeezing Florida's beaches until they disappear between armoring and a rising sea. In addition to other ecological functions, Florida's beaches host the densest sea turtle nesting in the United States, the largest aggregation of loggerhead nesting in the world, and the second highest density of green sea turtle nesting in the hemisphere. Florida's beaches also contribute to a multi-billion dollar tourism industry and provide storm protection for development near the coast. The ecological services provided by Florida's beaches makes protecting them imperative. The sea turtles' very survival—and our well-being as a state—depend on our success in protecting our beaches.

Beaches naturally move and represent a very dynamic system. Wind and waves constantly reshape beaches and dunes. Severe storms can move beaches significantly landward and eliminate entire dunes, while subsequent natural processes work to redeposit much of the lost sand back onto the beaches in the weeks after a storm. Artificial inlets, including dredging and jettying, contribute significantly to beach erosion as well. Dynamic, moving beaches are nothing new; beaches have moved for millennia due to sea level rise. Over geologic time beaches have ranged from hundreds of miles seaward to far inland of their present location. Sea turtles, which have survived millions of years, have weathered all these changes. The threat to dynamic beaches today, however, has one significant difference from the past: large-scale human development.

When development and a moving beach come into conflict, a limited number of options present themselves. We can "armor" the beach by constructing sea walls, bulkheads, revetments, or other structures designed to stop erosion. This protects the development in the short term but, without other action, leads to elimination of the beach. Armoring is also very costly, possibly not technically feasible for the long term, and may lead to the perverse result of more development.

Instead of armoring, the development could relocate back from the beach as the beach moves. This has only seldom been used as an approach in Florida, and for large structures is all but impossible. The third option, "nourishment," has been Florida's dominant approach since the 1980s. Nourishment consists of placing sand, usually dredged from an offshore site, on the beach to make the beach higher and wider. For many years nourishment has been presented as a panacea to the conflict between dynamic beaches and development, but it in some cases *increases* the conflict by promoting more development than otherwise might occur on the beach. In addition, it is increasingly understood that nourishment has severe limits as a general policy for managing beaches. The environmental impacts of beach nourishment on coastal resources

may be greater than often realized. Some property owners now fight against beach nourishment as a violation of their property rights. Limited sand supplies and the energy-intensive nature of beach nourishment raise questions about the sustainability of nourishment as a "solution" to dynamic beach movement.

We have no power to stop storms and hurricanes, and they will continue to hit Florida as they have in the past, causing extensive damage and erosion. We also cannot stop the continuing trend of sea-level rise, which contributes to the landward movement of beaches. In 2007 47% of Florida's beaches qualified as critically eroding, a number which has only been growing. Since it appears unlikely that constant nourishment can hold back the rising waters and moving beaches, the long-term perspective requires us to focus on the factors that we *can* control. These factors include coastal development and armoring.

First, we should reconsider polices that subsidize development that will come into conflict with the movement of the beach-dune system. At the federal level, the Federal Emergency Management Agency (FEMA) contributes millions of dollars to beach nourishment. Instead of just protecting existing development, beach nourishment has then been used to allow even more development ever closer to the water. FEMA gives out millions of dollars in disaster aid to those that suffer loss from the foreseeable hazard posed by hurricanes in Florida. FEMA also administers the National Flood Insurance program, which subsidizes flood insurance that makes more feasible development in risk-prone coastal areas, including paying out 25-30% of payments to 1% of the properties due to repetitive rebuilding and loss. All this comes at great financial cost to the general public as FEMA in the past has "written off" (i.e.—paid through general tax revenues) multi-million dollar losses and FEMA currently has a $17 billion dollar debt.

At the state level, Florida also subsidizes property insurance for those living in risk-prone coastal areas by placing extra charges on almost all kinds of insurance sold in the state, regardless of whether the insurance relates to property and regardless of whether the purchaser lives in a coastal area. Thus, the state uses its power to force those that choose to live in less risk-prone areas to pay the additional costs incurred by those choosing to live in the most risk-prone areas. In addition to this, Florida has also created a reinsurance company—or insurer of insurance companies—to provide reinsurance to the state-run insurance company and private insurers in the state. Just as with the state insurance, this reinsurance fund is ultimately backed by the resources of the State of Florida. All this transfer of private risk taking onto the public coffers puts the long-term economic health of Florida at peril. In 2004 Florida's insured coastal exposure was estimated at close to $2 billion, and the state-run insurer has now become Florida's number one insurer of coastal property. According to a Towers Perrin study, a one-in-fifty probability hurricane would result in the average Florida household paying an extra $188 every year for thirty years to pay the loss insured by the state-run insurance program while a one-in-two-hundred-and-fifty year storm would cost about $450 per year per household for thirty years.

In addition to removing subsidies for coastal development, design and siting of coastal construction need reform to promote dynamic beaches for sea-turtle nesting. Defects in the current permitting program prevent the program from effectively siting new development or rebuilding of development sufficiently landward to adequately protect the beach-dune system.

The current system lacks an effective setback line; allows construction closer to critically-eroding beaches if there is beach nourishment; permits local governments to issue emergency armoring permits which have resulted in "take" of sea turtles; promotes erosion through allowance of armoring; and generally suffers from a lack of effective and transparent criteria. The program needs reforms including greater transparency; accounting for sea-level rise in all aspects of the program; requirement of deed restrictions against armoring for all permits for major habitable structures; elimination or reform of the provision allowing new construction up to the "existing line of construction"; changes to the 30-year erosion projection line to ensure it is effective in protecting the beach-dune system; additional limitations on development in areas with little or no development; tighter requirements for eligibility for coastal armoring; adjustment of the geographical area subject to coastal permitting; limited rebuilding of destroyed structures and infrastructure; and narrowing of the exception allowing armoring to bridge a gap between existing armoring structures.

The state's coastal construction permitting process alone cannot and should not have to shoulder the entire burden of protecting the state's beaches. Local governments share the responsibility to protect resources under their jurisdiction and plan for future changes. The comprehensive planning process of local governments can serve as a very flexible and effective tool for guiding development to preserve dynamic beaches and sea turtle nesting. Few local governments have even begun to plan for sea-level rise; Florida should require local comprehensive plans to address sea-level rise, dynamic beaches, and sea turtle nesting. For example, local comprehensive plans could be required to assess coastal areas for the risks they face from erosion, storm surge, and sea-level rise. Areas should be and categorized according to their density levels, giving each density level differing treatment. These two sets of information could then be combined to create a zoning overlay area where policies for new construction, rebuilding, and coastal protection would vary depending on existing development density and risk. Local plans could prohibit or limit publicly-funded infrastructure in areas at risk for flooding, erosion, or storm surge. When permitted, coastal development should be required to record a deed restriction that the property will never be allowed to armor.

Creative zoning and permitting measures could also help promote more orderly movement back from the beach where development already exists and steer new development away from areas at risk from erosion, flooding, or storm surges. Zoning could promote uses that more easily give way to moving beaches, such as parks and golf courses. Local governments could purchase at-risk properties in fee simple, purchase "rolling easements" or purchase the right to significant development on land not yet developed. Permitting criteria could in some cases also exact a "rolling easement" that would allow the beach to move unimpeded by human development. Redevelopment or rebuilding, if not entirely prohibited, could serve as the time to exact a rolling easement. Policies promoting movement of development back from the beach may not receive local support until nourishment—funded in large part by the state and federal governments—is no longer an option and state and federal subsidies for local development are curtailed. During the interim period, it is at least important to stop, limit, or place conditions on new development in areas threatened by erosion or sea-level rise.

A significant part of any effort to protect Florida's dynamic beaches and the sea turtles that depend on them must begin with an effort to inform the public about beach dynamics, the feasibility and costs and benefits of policies such as nourishment, armoring, and promoting dynamic beaches. Particular attention should be given to increase notice requirements to potential purchasers of coastal properties that the property may be threatened by erosion, storm surge, or sea-level rise. In addition, mapping, modeling, and other resources should be promoted to the public and available via the internet and fact sheets.

The Endangered Species Act (ESA) presents another possible tool for protection of dynamic beaches for sea turtle nesting. The coastal construction permitting process currently is limited by the ESA only when a proposed project is considered to "take" sea turtles by modifying their nesting habitat. Florida has recently begun a process to evaluate the possibility of developing a "habitat conservation plan" under the ESA to protect sea turtles across the state. Such a plan could allow the federal government to give Florida a permit that would allow Florida to "take" a certain number of sea turtles each year. Florida's coastal construction permitting program would be the permit holder, but that program alone may not be capable of implementing all measures that would be appropriate in a plan to protect sea turtles. Thus, the process to establish a habitat conservation plan could serve as the unifying force and principle tying together the myriad statutory and regulatory reforms that could protect dynamic beaches as sea turtle nesting habitat even as the waters rise around Florida.

Many of the suggestions contained here may lead to claims that the regulatory action has caused a "taking" of private property in contravention of constitutional protections and state statutory provisions. Constitutional takings law has few hard and fast rules. This makes it difficult, if not impossible, to assure that policies to discourage inappropriate coastal development may not rise to a constitutional taking on a case-by-case basis. Overall, however, careful, integrated policies combined with incentive and payment programs can minimize the number of constitutional takings claims and usually avoid a judgment that a taking has occurred. In addition, the state law known as the Bert J. Harris, Jr., Private Property Rights Protection Act creates an additional cause of action for regulatory takings. While the Act's threshold for a taking—an "inordinate burden"—has not been clarified by case law, the Act may pose greater challenges than constitutional takings law on the policies included here.

SUMMARY RECOMMENDATIONS

Federal Level:

- Redirect nourishment funds of FEMA's Hazard Mitigation Grant Program and Flood Mitigation Assistance Program for increased buyouts of coastal property
- Further limit benefits for properties eligible for buyouts that do not voluntarily participate
- Increase premiums for the NFIP in coastal areas subject to erosion or sea-level rise

State and/or Local Level:

- Create state and local education programs concerning:
    - Beach dynamics

  - Sea-level rise
  - Advantages and disadvantages of different policy responses
- Enact significant reforms to Florida's Coastal Construction Control Line (CCCL) program (Chapter 161, Florida Statutes)
  - Broaden application and authority of the Florida Department of Environmental Protection to protect the beach by replacing the phrase "beach-dune system" in Chapter 161 with "dynamic beach system"
  - Establish area- or region-wide construction setbacks
  - Improve the transparency of the permitting process by creating detailed templates and matrices for analysis of impacts of proposed projects. The methods and evidence included in such analyses should be clearly represented in the permit file and understandable to those reviewing the file.
  - Either eliminate the statute granting local governments authority to issue temporary armoring permits or reform it by specifying in the statute that issuance of a local permit does not assure issuance of a permanent state permit, that all risk of failure to receive a permanent state permit resides with the property owner, and that prior to construction a property owner must post a bond for removal costs should the state permit be denied.
  - Require that all permits for new, non-armoring construction are conditioned on recordation of a deed restriction noting that the property will never be allowed to armor.
  - All new permits for non-armoring should require an easement whereby the property owner must remove any structure interfering with the natural dynamics of the dynamic beach system.
  - The "line-of-construction" provisions should be modified to set minimum requirements to assure that it is only applied in situations of existing, high-density construction; the provisions should also set criteria defining a "reasonably continuous and uniform line of construction" that qualifies as the basis for exception. (Alternative: establish area- or region-wide setbacks)
  - If maintained, the term "unduly affected by erosion" should be statutorily defined to include any property which has armoring, which has applied for armoring, which is on a nourished beach, which lies seaward of the 30-year erosion projection line (as modified per suggestions below), or is in an area classified as "critically eroding."
  - Current "eligibility" requirement for armoring should be modified to add that structures built without a CCCL permit are not eligible unless they are within a densely-developed area served by central water and sewer.
  - Current "eligibility" requirements should be modified to prohibit armoring for *any* structure built after 2008.
  - All major habitable structures receiving a permit to build, construct additions, or rebuild should be required to record a deed restriction prohibiting any armoring of the property where the project is located.
  - The 30-year erosion projection should be extended to consider a longer time frame; the time frame could, if desired, be divided into one time frame for single

family homes and a longer one for major infrastructure, commercial, or multifamily dwellings.

- Account for a significant time span of SLR in calculation of the 30-year erosion projection line.
- No credit for nourishment projects should be given when calculating the 30-year erosion projection unless the nourishment project is determined to be necessary *exclusively* due to erosion caused by inlet maintenance.
- The 30-year erosion projection line should be placed at the landward toe of the primary dune, when present, rather than at the seasonal high water line. Other provisions should be developed for a setback when no discernible dune is present. The 30-year erosion projection should never simply be placed at the existing "line of construction" as a default.
- Limitations on new development should be developed for areas that currently have primarily residential, low-density residential, or limited development. Several possible options could serve this end:
    - New structures might be allowed in low-density or undeveloped areas seaward of the CCCL only if the building is designed to be disassembled and/or moved and if the property owner can demonstrate fee-simple ownership of an undeveloped lot (with deed restrictions limiting its use to relocation of the proposed structure) significantly landward and within a reasonable distance of the proposed structure's site.
    - Alternatively, a new structure might be allowed if the structure is built to fail in an extreme storm event and rebuilding would be dependent upon sufficient space remaining on the affected property. Any such permit should also require a bond or insurance policy to pay for clean up of a destroyed structure.
    - Alternatively, a new structure might be allowed if the proposed property has sufficient depth to allow relocation behind the projected location of the landward toe of the primary dune as determined by the modified 30-year erosion projection.
- Rebuilding of damaged structures should be limited and conditioned to discourage substantial new investment in existing properties, thus promoting the possibility of eventual relocation out of areas subject to sea-level rise and other highly hazardous areas.
- A major habitable structure should be allowed to be rebuilt only once with the permit conditioned on recordation of a deed restriction noting that future rebuilding in the same location is prohibited. In addition, no rebuilding should be permitted in the coastal high hazard area, which may need to be redefined to include more than just the area subject to a category 1 storm surge.
- Rebuilding of armoring should be modeled on Brevard County's approach of only allowing a rebuild if the cost is less than 50% of the sea wall. New armoring should generally be prohibited.
- The "close-the-gap" provision should be modified to only apply in densely-developed areas. The impact of excluding property in non-densely-developed

areas could be mitigated by a state law creating a right of action for property owners for damages due to the erosive effects of neighboring armoring.
    - The CCCL program should incorporate a significant program promoting accommodation of the dynamic beach system by offering incentives for relocation of existing structures prior to the structure's succumbing to forces of the beach or coastal storms.
    - Develop more rigorous standards for research on the environmental impacts of beach nourishment projects, including research design that assesses biota prior to nourishment, controls for ordinary temporal changes in biota, includes anonymous and independent peer review, considers cumulative impacts, and uses the best scientific tools and modeling practices.
- Require local governments have all the integrated policies recommended for movement back from the beach before they qualify for beach nourishment
    - Alternatively, state and local funding for beach nourishment should be entirely redirected into implementation costs for policies to move back from the beach
- Design policies to promote accommodation of dynamic beaches using indicator events so that the final act of moving back from the beach—removal of structures and infrastructures—is planned for early on but not executed until necessary for the health of the dynamic beach; this approach can minimize the cost of accommodation and maximize the use and value of private property
    - Acquisition programs could take advantage of this by purchasing property one row back from the beach at lower cost, then either lease or resell the property subject to a rolling easement
- Create a constitutional provision allowing property tax breaks for beach-front property owners that, prior to a structure being damaged by storm or erosion, voluntarily agree to relocate upon occurrence of an agreed-upon even (such as a certain amount of damage from erosion or erosion coming within a certain distance of the foundation of a structure)
- Create special taxing districts that charge oceanfront properties a premium to offset the increased costs incurred by local government for maintenance of infrastructure subject to flooding and erosion damage
- Limit additional oceanfront development
- Statutorily create liability for increased erosion caused by armoring
- Link availability and amount of hazard mitigation assistance and post-disaster funding to prior local government implementation of integrated policies to promote accommodation of the dynamic beach; examples of planning strategies include:
    - Creation of detailed risk maps delineating areas at risk for erosion, sea-level rise, and storm surge
    - Impose drastic limits on capital infrastructure expenditures in areas subject to erosion, sea-level rise, and storm surge dangers
    - Prohibit hazardous and most non-water-dependent commercial development along the beach
    - Allow for limited development in areas threatened by erosion, sea-level rise, and storm surge dangers subject to
        - Rolling easements
        - Development designed to be moved or deconstructed

        - Insurance or bonding to remove development upon a certain amount of damage or beach movement
    - Condition beach nourishment funding and/or state disaster assistance and/or planning assistance on development of adequate local post-disaster redevelopment plans designed, as feasible, to limit rebuilding and armoring and foster the ability of the beach to move naturally
    - Increase beach setback requirements
    - Develop retreat 'corridors'
    - Provide remote parking and public transportation for daytime beachgoers
- Institute building codes requiring relocation-friendly construction
- Create additional revenues
    - adjusting property and occupancy taxes to reflect proximity costs (i.e. to charge shorefront development costs commensurate with their higher risk and higher cost for infrastructure)
    - require property owner contributions to the costs of accommodation of dynamic beached
- Use a statewide habitat conservation plan under the Endangered Species Act as a unifying principle for enacting state-level reforms necessary to protect dynamic beaches

I. Setting the Stage: Florida's Beaches and Sea Turtles

Sea turtles have survived over 100 million years[1] during which sea levels have changed dramatically.[2] Nonetheless, current predictions for sea-level rise (SLR) present greater challenges than ever to sea turtles. Beaches are naturally dynamic, moving in response to winds, waves, currents, storms, and sea level.[3] During past sea-level rise, the beach-dune system migrated along with the ocean. Today, however, our ability to preserve and protect beaches as dynamic sea turtle nesting habitat is a direct function of coastal development. Where development occurs nears the water, dynamic sea turtle nesting habitat is in danger as the beach cannot migrate landward with the rising sea.[4] Sea turtles do not care about SLR itself, they only

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[1] Katherine R. Butler, *Coastal Protection of Sea Turtles in Florida*, 13 J. LAND USE & ENVT'L L. 399, note 1 (citing sources listing the time sea turtles have existed as between 90 and 175 million years).

[2] The Florida panhandle has already experienced about eight inches of SLR over the last century. Union of Concerned Scientists, Global Warming: Florida, available at http://www.ucsusa.org/gulf/gcstateflo_cli.html. *See also*, Harold Wanless, *Sea Level Rise: So What?* JOURNAL OF SEDIMENTARY RESEARCH (52(4): 1051 (1982) (noting trend of sea-level rise).

[3] Charles H. Peterson & Melanie J. Bishop, *Assessing the Environmental Impacts of Beach Nourishment*, Bioscience 887, Vol. 55, No. 10 (October 2005).

[4] *See, e.g.* Robert T. Watson, Marufu C. Zinyowera, Richard H. Moss, *IPCC Special Report on The Regional Impacts of Climate Change: An Assessment of Vulnerability*, Sect. 8.3.6.3., *available at* http://www.grida.no/climate/ipcc/regional/index.htm; *see also* L.A. HAWKES, A.C. BRODERICK, M.H. GODFREY, B.J. GODLEY, Investigating the potential impacts of climate change on a marine turtle

care about having a natural, dynamic beach on which to nest. The dynamic nature of Florida's beaches is at risk.

Florida enjoys 825 miles of sandy beaches.[5] These beaches serve as nesting habitat for five species of threatened or endangered sea turtles.[6] Florida's beaches host the densest sea turtle nesting in the United States, the largest aggregation of loggerhead nesting in the world,[7] and the second highest density of green sea turtle nesting in the hemisphere.[8] Florida's beaches also provide habitat for hundreds of other species as well. In addition to providing recreational and esthetic values to residents, Florida's beaches attract millions of tourists—and their money—each year.[9] An estimated value about $1 trillion of coastal property in Florida[10] fills local government coffers through ad valorem tax assessments. Beaches and their dunes also act as the first line of protection for human development from storm impacts.

Even as Florida's beaches contribute so much to the state, they have become the focal point for tension between natural beach dynamics and development. Ever-increasing development on Florida's shorelines provokes commensurate increases in the amount of property threatened by erosion, or shoreline migration. Shoreline migration is a natural phenomenon occurring in response to sea level, wave energy, and sand supply dynamics. Shoreline migration becomes a

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population Global Change Biology (OnlineEarly Articles), *available at* http://www.blackwell-synergy.com/doi/abs/10.1111/j.1365-2486.2006.01320.x.

[5] Florida Coastal Management Program, Final Assessment and Strategies: FY 2006-2010, page 1 ("Florida's coast is 8,400 miles long and includes 825 miles of sandy beaches.").

[6] Loggerhead sea turtle (*Caretta caretta*), threatened; green sea turtle (*Chelonia mydas*), endangered; kemp's ridley sea turtle (*Lepidochelys kempii*), endangered; hawksbill sea turtle (*Eretmochelys imbricata*), endangered; leatherback sea turtle (Dermochelys coriacea), endangered.

[7] *See* Loggerhead Nesting in Florida, Florida Fish and Wildlife Conservation Commission, available at http://floridamarine.org/features/view_article.asp?id=2411.

[8] *See* Green Turtle Nesting in Florida, Florida Fish and Wildlife Conservation Commission, available at http://floridamarine.org/features/view_article.asp?id=2496.

[9] While the figures contain substantial variation, estimates of tourism's economic impact over the past several years all reach well into the billions of dollars. In 2005, Florida had 86 million visitors, spending $62 billion and the majority were visiting coastal resources. Robert R. Twilley, *Coastal Wetlands & Global Climate Change: Gulf Coast Wetland Sustainability in a Changing Climate*, Pew Center on Global Climate Change (Dec. 2007). The Center for Urban and Environmental Solutions estimates the impact of beach tourism in 2003 at $39 billion. www.cuesfau.org/publications/EconomicsofBeachTourismFactSheet-July2005.pdf. Tourism brought $46.7 billion into Florida in 1999 and constitutes Florida's largest industry. East Central Florida Regional Planning Council, Land Use Impacts and Solutions to Sea Level Rise in East Central Florida, page 7 (2004), available at www.ecfrpc.org/Files/Projects/SEALEVEL_RISE_REPORT_11-04.pdf.

[10] FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS, COASTAL HIGH HAZARD STUDY COMMITTEE FINAL REPORT 9 (Feb. 2006).

problem and is called "erosion" when shoreline migration threatens human structures or property interests along the coast.[11] Currently over 485 miles, or approximately 59%, of the state's beaches are experiencing erosion, and about 388[12] of the state's 825 miles of sandy beaches are subject to what is called critical erosion, a level of erosion that threatens development, recreational, cultural, or environmental interests.[13] Storms and armoring as well as inlets and sea-level rise contribute to migration or erosion of Florida's beaches.

A. *Storms, Armoring, and Erosion*

Storms constitute a central fact of life for Florida. Data compiled by the National Oceanic and Atmospheric Administration on the 30 most powerful storms over the period 1900 to 1996 show that more than 40 percent of the damage they caused occurred in southeast Florida. Of the 158 hurricanes that hit the United States, 47 hit Florida and 26 of those struck the Southeast Florida coast.[14] The 2004 and 2005 hurricane seasons were particularly hard on Florida. In 2004 hurricanes Charley, Frances, Ivan, and Jeanne hit Florida.[15] The 2005 season saw strikes on Florida by hurricanes Dennis and Wilma.[16] Even storms that do not qualify as hurricanes can cause significant erosion.[17] To make matters still worse, the intensity of tropical storms is projected to increase due to climate change[18] as will the cost of the damage due to the storms.[19]

Hurricanes and other storms cause rapid loss of sand on Florida's beaches, leading to loss of property and damage to structures. Two key parts of Florida's response to storms and erosion have become placing sand on the beaches and armoring. The legal mechanisms and problems associated with these activities are more fully explored below.

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[11] BUREAU OF BEACH AND COASTAL SYSTEMS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, CRITICALLY ERODED BEACHES IN FLORIDA 3 (June 2007) available at http://bcs.dep.state.fl.us/reports/crit_ero.pdf.

[12] *Id.* at 2.

[13] BUREAU OF BEACHES AND COASTAL SYSTEMS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, CRITICALLY ERODED BEACHES IN FLORIDA 3 (updated June 2007)**,** available at bcs.dep.state.fl.us/reports/crit_ero.pdf.

[14] Insurance Information Institute, http://www.iii.org/media/hottopics/insurance/catastrophes/.

[15] *See* information at the Central Florida Hurricane Center, www.flhurricane.com

[16] *Id.*

[17] For example, on May 14 of 2007, Florida declared an emergency for certain portions of the eastern shoreline in response to the effects of subtropical storm Andrea. DEP Emergency Final Order, OGC No. 07-0819 (May 14, 2007).

[18] International Panel on Climate Change 2007 Synthesis Report, 3.2.2. There is less certainty about the future frequency of tropical storms. *Id.*

[19] DR. JULIE HARRINGTON AND DR. TODD L. WALTON, CLIMATE CHANGE IN COASTAL AREAS IN FLORIDA: SEA LEVEL RISE ESTIMATION AND ECONOMIC ANALYSIS TO YEAR 2080 (Feb. 2007).

Armoring beaches exacerbates erosion.[20] Many CCCL permit files contain analysis that acknowledges that armoring contributes to erosion on adjacent, non-armored property.[21] In fact, in many instances, part of the justification for armoring on one property is the erosive effect of neighboring armoring.[22] In some more recent permits, DEP and BBCS have taken a new approach: assume no adverse impacts to neighboring property from armoring-induced erosion if the return walls for the armoring are five feet or more from the adjacent property.[23]

B. *Inlets as a Cause of Coastal Erosion*

Inlets have been recognized as a major cause of erosion on Florida's beaches.[24] A 1994 study by Emmett R. Foster, P.E., examined inlet-induced erosion.[25] The study covered the "types of erosion patterns that should be found on the downdrift side of the inlets."[26] The paper's results,

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[20] *See, e.g.* paragraph 11, DEP Final Order IN RE: Petition for variance from or waiver of Rules 62B-33.002(32), 62B-33.0051(1)(a), 62B-33.0051(1)(a)2, and 62B-33.0051(1)(d), Florida Administrative Code, by Thomas G. Tomasello, P.A., on behalf of Gary L. and Caren L. Marder, and Janina Radtke in Palm Beach County; File Number PB-787 (Variance); Memo to Permit file VO-1018 AR (October 10, 2005).

To oversimplify, armoring exacerbates erosion for two reasons. First, armoring locks up sand behind it, keeping sand from the dunes from sloughing down and becoming part of the active movement of sand on the beach. Since the system cannot get sand from behind the armoring, the system needs to take more sand from someplace else. Second, during a significant erosion event, much sand that is carried offshore is eventually redeposited on the beach thorugh natural processes, but armoring can interfere with this process and prevent sand from naturally accumulating again on the beach.

[21] *See, e.g.* Analysis of Impacts, DEP file #FR-816 AR ATF; Analysis of Impacts, sections II, III.B.3, DEP file # CH-531 AR.

[22] *See, e.g.* Analysis of Impacts sec. IV, DEP Permit #FR-816 AR ATF

[23] *See, e.g.* Analysis of Impacts sec. IV.B., DEP Permit # WL 925 AR M1.

[24] Fla. Stat. § 161.142 (2007) ("The Legislature further recognizes that inlets alter the natural drift of beach-quality sand resources, which often results in these sand resources being deposited around shallow outer-bar areas instead of providing natural nourishment to the downdrift beaches."). The law goes on to require that at least as much sand as would naturally move along the shore be placed on beaches on the downdrift side of inlets.

[25] The study was actually published in a shorter form as Foster, E.R., The Expected Erosion Pattern Downdrift from a Jettied Inlet, 151-159, 1994, in the Proceedings of the Hornafjordur International Coastal Symposium, Iceland. The form cited here is EMMETT R. FOSTER, P.E., FLORIDA DEPT. OF ENVIRONMENTAL PROTECTION, A GUIDE TO UNDERSTANDING INLET-INDUCED EROSION PATTERNS: EXPECTATIONS FROM NUMERICAL MODELING (September 1994) [hereinafter INLET-INDUCED EROSION PATTERNS].

[26] INLET-INDUCED EROSION PATTERNS, *supra* note 25, at 2.

which were based on numerical modeling, were later tested against actual inlet erosion patterns and confirmed.[27] The following is a brief discussion of those results.

In the simplest model, an inlet on a "straight" beach on the East coast of Florida with average wave attack angles and average wave height was considered.[28] Using this model the study concludes that the typical erosion pattern is progressive and non-linear; the areas closest to the inlet erode first and fastest; and areas further from the inlet do not immediately erode but eventually are caught in the erosion pattern.[29] These effects continue in the direction of the longshore currents until another boundary is encountered.[30] The study also describes several factors that will affect this simplified model.

The first such factor is the addition of nourishment project immediately south of the inlet, just beyond the downdrift jetty. The study concludes that the nourishment sand, or fill, will spread southward over time, providing a source of sand for down drift beaches.[31] As a result, nourishment projects only "reset[] the erosion clock: the original erosion pattern is interrupted and delayed by the fill; but eventually is reestablished at essentially the same rates . . . ."[32] Even if the nourishment projects were repeated every few decades, "the effect . . . would be to delay the erosion pattern for as long as the repeated fillings occur. Once the filling stops, the original erosion pattern can be expected to begin again unless the basic controlling factors of wave climate and sand supply are changed."[33]

The study concludes that wave height and wave attack angle are the two most important factors in the longshore sand transport system, i.e. increasing either will increase erosion, with wave angle being the more determinative of the two.[34] Even when the wave height and angle are changed, the rate of erosion downdrift from a jetty or other structure does not ever seem to reach zero, meaning erosion will continual endlessly.[35] In fact, the only limit on downdrift erosion seems to be a southerly boundary, in other words, another inlet.[36]

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[27] EMMET R. FOSTER, P.E., FLORIDA DEPT. OF ENVIRONMENTAL PROTECTION, THE COMMON THREAD IN INLET-INDUCED EROSION: BASIC THEORY AND FLORIDA EXAMPLES (1995). "The author contends that there are at least 33 inlets in Florida that exhibit essentially the same erosion pattern as determined here from theory. These appear to differ from the general case only in the details of the local conditions." INLET-INDUCED EROSION PATTERNS, *supra* note 25, at 3.

[28] INLET-INDUCED EROSION PATTERNS, *supra* note 25, at 4.

[29] *Id.* at 6. *See also* Figure 1A; Figure 1B. *Id.*

[30] *Id.* at 6-7

[31] INLET-INDUCED EROSION PATTERNS, *supra* note 25, at 9.

[32] *Id.* at 10. *See also* Fig. 2A.

[33] *Id.* at 10. *See also* Fig. 2A; Fig. 2B.

[34] *Id.* at 24. *See also* Fig. 10A; Fig. 10B.

[35] INLET-INDUCED EROSION PATTERNS, *supra* note 25, at 25. *See also* Fig, 10B.

[36] *Id.* at 26.

Since Florida has many inlets, the study also examined the patterns of erosion caused by a system of inlets and jetties. The study found "that the shoreline change pattern on one side of . . . [a] mid-point line . . . is a mirror image inverse of the other. That is, the erosion on the left side is exactly equal to the accretion on the right side."[37] Moreover, the study found that due to the natural downdrift of sand, the effects of the inlet will migrate over time in the direction of the downdrift current, creating a wave of erosion and accretion pattern.[38] This wave will continue until it interacts with another inlet or other boundary.[39]

In reality, the study notes, each inlet will experience changes in several of the factors described; thus, the study described the effects of superimposing the factors on one another. In doing so the study concluded that the factors were additive. For example, if the wave energy and wave angle were increased at an inlet, and a nourishment project were completed south of the jetty, then all three factors would compound and there would be a "double" increase in the rate and extent of erosion at the jetty, but such increase would be delayed because of the nourishment project.[40]

Overall, the study illustrates that inlets increase both the rate and extent of erosion. In addition, the study shows that nourishment projects do not compensate for these effects, they only delay them, and that even when nourishment projects are repeated, they only maintain "a stalemate with the forces causing the erosion."[41] Essentially, nourishment is not a solution to the erosion caused by inlets.

C. *Liability for Erosion Caused by the Government*

Evidence that inlets cause or exacerbate erosion on neighboring beaches leads to the question of whether erosion of a citizen's property caused by a government-built-and-maintained inlet will result in a taking of property for which compensation is due. In the early 1970s this question was answered in the negative in the case of *Pitman v. U.S.* on the basis that the government did not directly access the plaintiff's property.[42] This holding was overruled in 1988 by a case that held that a government action which caused flooding and erosion did constitute a taking of property even if the government did not enter the property.[43] Beginning in the 1990s, a legal battle involving the same project as the *Pitman* case came out much differently due to the

[37] *Id.* at 27. *See also* Fig, 11A.

[38] *Id.* at 31.

[39] *Id.* at 31.

[40] INLET-INDUCED EROSION PATTERNS, *supra* note 25, at 30. *See also* Fig. 12A.

[41] *Id.* at 14.

[42] Pitman v. U. S., 457 F.2d 975, 977 (1972). Robert Pitman argued in the U.S. Claims Court that the government should compensate him for the four acres of beach he lost from erosion due to a U.S. Army Corps of Engineers dredging project to create Port Canaveral.

[43] Owen v. United States, 851 F.2d 1404, 1409, 1413-14 (Fed. Cir. 1988).

intervening change in jurisprudence. In *Applegate v. United States*,[44] several landowners brought an action alleging a taking of their beachfront property through erosion due to the Port Canaveral project of the U.S. Army Corps of Engineers.[45]

The plaintiffs argued that jetties constructed as part of the project and periodic dredging of the channel blocked the flow of sand, and that but for the project, this sand would have deposited on plaintiffs' properties south of Canaveral Harbor.[46] The government disputed the plaintiffs' claims. The court found that the landowners failed to make an appropriate showing of evidence of loss of beachfront property, and thus the court was precluded as a matter of fact and law from holding that any loss occurred.[47] Nonetheless, the court reiterated the rule that flooding and erosion above mean high water that was caused by governmental action was a compensable taking.[48]

The court also stated that the construction does not need to directly encroach upon the landowner's property to constitute a taking.[49] It is not the location of the cause that is relevant, but the location of the effect of the government action causing the damage.[50]

While the court in *Applegate* refused to find that a taking had actually occurred because of the lack of evidence of erosion and flooding, the parties eventually settled and the Corps agreed to construct a $42 million shore protection project, restore 12.7 miles of shoreline, and gave the property owners $5 million to divide among themselves.[51]

In 2007, another U.S. Army Corps of Engineers project led to a successful takings claim based on land lost due to erosion. In *Banks v. United States*,[52] the plaintiffs claimed that construction and maintenance of harbor jetties by the Corps caused erosion to their properties such that their property had been taken.[53] Early on in the harbor jetty project, the Corps attributed part of neighboring erosion to the jetties, and instituted a nourishment project to offset the effect. After extensive and complex testimony about littoral transport, properties of nourishment material, and

[44] 35 Fed. Cl. 406 (1996).

[45] Applegate v. United States, 35 Fed. Cl. 406, 411 (1996).

[46] *Id.*

[47] *Id.* at 416.

[48] *Id.* at 414. The court also cited *Owen v. United States*, 851 F. 2d 1404, 1414 (Fed. Cir. 1988).

[49] *Applegate, supra* note 161, at 414.

[50] *Id.* (citing *Owen*, *supra* note 168, at 1412).

[51] Jim Waymer, *Attorneys Relish Win Over Corps, Lawsuit Victory Brings Sand, Settlement to Brevard*, Florida Today.

[52] 78 Fed. Cl. 603 (Ct. Cl. 2007).

[53] *Id.*

amount of beach nourishment, the court concluded that the Corps did not effectively mitigate all the erosion its project caused to plaintiffs' land.[54]

After the *Applegate* case and settlement agreement and the *Banks* case, it appears that beach nourishment and takings claims may become another cost of inlet management. Florida statutes also seem to acknowledge potential liability of the state for erosion as Florida has exempted from certain permitting criteria projects proposed on downdrift beaches affected by certain inlets and related activities.[55] In 2008 the Florida Legislature passed a bill that would create an exception to this, and the governor signed the bill into law on June 30, 2008.[56] The bill requires assignment of responsibility for erosion caused by inlets and specifying what DEP must do in the case of disputes between property owners and local governments regarding amount of sand bypass.[57]

D. *Sea-Level Rise (SLR)*

Inlets and storms may have been the historic culprits in much erosion, but sea-level rise (SLR) will take their place.[58] SLR is not new, and sea level has already risen since the 1930s.[59] The SLR of concern here is that which originates with climate change[60]—an overall warming of earth's average temperature. The majority of eustatic, or global, SLR for the near term is due to thermal expansion of the ocean's water as it warms. SLR due to feedback loops and melting of glaciers has largely been unaccounted for in many estimates of SLR.

Florida is undoubtedly among the states in the United States with the most to lose in the face of SLR, and the State of Florida is beginning to admit that SLR jeopardizes Florida[61] and causes

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[54] *Id.*

[55] FLA. STAT. § 161.142(3) ("Construction waterward of the coastal construction control line on downdrift coastal areas, on islands substantially created by the deposit of spoil, located within 1 mile of the centerline of navigation channels or inlets, providing access to ports listed in s. 403.021(9)(b), which suffers or has suffered erosion caused by such navigation channel maintenance or construction shall be exempt from the permitting requirements and prohibitions of subsections (2), (5), and (6) of s. 161.053. . . .").

[56] CS/HB 1427. Laws of Florida, ch. 2008-242.

[57] Florida Laws Chapter 2008-242 available at http://laws.flrules.org/files/Ch_2008-242.pdf (last visited August 7, 2008).

[58] While SLR may become the greatest driver for future erosion, the most obvious expression of the erosion will continue to be what occurs during storms.

[59] *See supra* note 2, Wanless, *Sea Level Rise: So What?*

[60] Relative sea level may also change due to changes in the earth's mantle.

[61] Florida Coastal Management Program, Final Assessment and Strategies: FY 2006-2010, page 8.

increased erosion.[62] Yet, Florida has not incorporated SLR into Florida's Coastal Management Program. Because the state's topography is relatively flat, minor increases in sea level can cause the beach to migrate far landward. Estimates for this process, called shoreline recession, vary greatly for Florida and may also vary radically from place to place in Florida depending on local conditions. However, as a rule of thumb, scientific analyses appear to indicate that shorelines in Florida are subject to 500 to 1,000 feet of shoreline recession for each foot of sea level rise.[63]

International Panel on Climate Change (IPCC) estimates of sea level rise, excluding future rapid dynamical changes in ice flow, range from .18 to .59 meters over approximately the next 90 years.[64] However, three factors may make such estimates dramatically lower than what could occur. First, as noted, this does not include observed changes in the rate of melting of ice sheets over Greenland and western Antarctica.[65] Second, recent studies demonstrate that the greenhouse gas emissions from India and China have risen faster than anyone anticipated, leading to the possibility of a 6 degree Celsius rise in temperature by 2030 instead of the IPCC's

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[62] Florida Coastal Management Program, Final Assessment and Strategies: FY 2006-2010, page 32.

[63] These estimates for Florida are the mid-to-high range of a number of estimates of shoreline recession for Florida assembled in a publication on SLR and planning. ROBERT E. DEYLE, KATHERINE C. BAILEY, AND ANTHONY MATHENY, ADAPTIVE RESPONSE PLANNING TO SEA LEVEL RISE IN FLORIDA AND IMPLICATIONS FOR COMPREHENSIVE AND PUBLIC-FACILITIES PLANNING (September 1, 2007).

Others have come to the conclusion that recession rates are lower. For example, one study has demonstrated that the rate of shoreline change is about 150 times greater than the rate of sea level change. K.Q. Zhang, B.C. Douglas, and S.P. Leatherman, *Global warming and coastal erosion* 64 Climatic Change 41, 54 (2004), *available at* http://www.springerlink.com/content/w072202jr03xh214/fulltext.pdf (citing S.P. Leatherman, K.Q. Zhang, and B.C. Douglas, *Sea Level Rise Shown to Drive Coastal Erosion: A Reply*, 81 EOS TRANSACTIONS 437 (2000)). Additionally, the "Bruun Rule" illustrates that "a one meter rise would generally cause shores to erode 50 to 200 meters along sandy beaches, even if the visible portion of the beach is fairly steep." Titus (1990) at 5 (citing P. Bruun, *Sea Level Rise as a Cause of Shore Erosion,* 1 JOURNAL OF WATERWAYS AND HARBORS DIVISION 116 (1962)). These lower estimates may not be as well calibrated to Florida's flat topography. The Bruun rule has more recently been severely criticized as wrong and damaging when used to set policy. *J.* Andrew G. Coopera and Orrin H. Pilkey, *Sea-level rise and shoreline retreat: time to abandon the Bruun Rule*, 43 Global and Planetary Change 157 (2004), available at http://psds.wcu.edu/WebFiles/PDFs/psds_Sea-level_2004.pdf.

[64] IPCC 2007 Synthesis Report, table SPM 1.

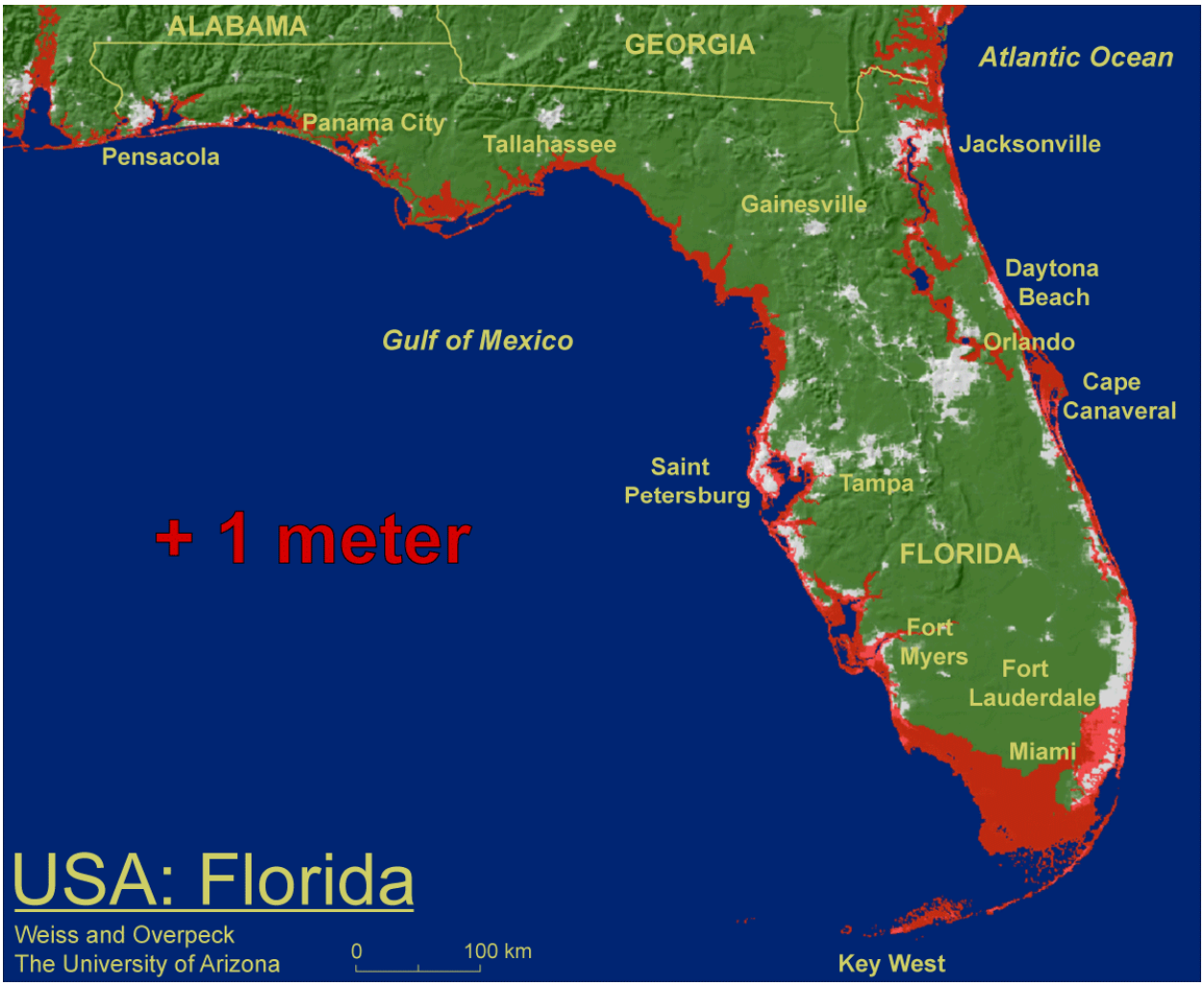
[65] U.N. Report Describes Risks of Inaction on Climate Change, NY Times, Nov. 17, 2007. While the IPCC report does discuss the Greenland ice sheet, the report acknowledges it relies on "current" models. *Id.* at 3.2.3. The "current" models, however, do not correspond to more recent observations on the increased rate of ice melt. *Id.* at 5.2. Estimates of the impact on ocean levels of the melting of the Antarctic and Greenland ice sheets vary dramatically. One estimates the impact as high as eighty meters of sea level rise. E. Lynn Usery, Modeling Sea-Level Rise Effects on Population using Global Elevation and Land-Cover Data, http://cegis.usgs.gov/pdf/aag-2007.pdf

modest estimate of 1-4 degrees by the end of this century.[66] Third, the estimates provided by the IPCC do not include the effects of carbon-climate cycle feedbacks,[67] and the effects of these feedbacks vary greatly in different climate models. In any case, the 2007 IPCC estimates of sea level rise are regarded as too low by many scientists, but higher numbers were not used because of a on-going uncertainties of how much more sea level will rise due to carbon-cycle feedback effects, increased CO2, and observations of ice sheets melting faster than anticipated by the models currently in use. In addition, some scientists have done calculations asserting that even the higher numbers by the IPCC report are far too conservative.[68] This paper will take the upper end of the IPCC projections (1.9 feet) as its estimate of sea-level rise.

[66] U.N. Report Describes Risks of Inaction on Climate Change, NY Times, Nov. 17, 2007.

[67] IPCC 2007 Synthesis Report.

[68] *See, e.g.,* DEYLE et al., *supra* note 63 (citing to the work of scientist Stefan Rahmstorf, who asserts that accounting for the uncertainties not included in the IPCC report conclusions would add more than 1 foot of sea level rise to IPCC estimates and that it cannot be ruled out that oceans could rise as much as 4.6 feet by 2100); *id*. at 9 (citing to Hansen's critique that ice sheet melting is non-linear and increasing, meaning that past observations of sea level rise inherently underestimate future trends and suggesting that, while impossible to accurately predict, sea level could rise by as much as 16.5 feet by 2100). The Miami-Dade County Climate Change Advisory Task Forces scientific assessment was that the IPCC's estimates of sea-level rise were "alarmingly conservative." Miami-Dade County Climate Change Advisory Task Force, Second Report and Initial Recommendations, Appendix 1.



From: The University of Arizona, Environmental Studies Laboratory, Department of Geosciences, available http://www.geo.arizona.edu/dgesl/research/other/climate_change_and_sea_level/sea_level_rise/florida/slr_usafl_i.htm

SLR will cost Florida as well. For example, metropolitan Miami has been listed as the as the number one most-vulnerable coastal city worldwide in terms of assets exposed if a 1 in 100 year surge-induced flood were to occur today, with current exposed assets estimated at $416 billion.[69] When SLR is considered, the picture is even bleaker: the report estimated up to $3.5 trillion in exposed assets by 2070.[70] In addition, the Everglades National Park is particularly vulnerable to SLR since 60% of the park is less than three feet above mean sea level. Applying the IPCC projections of an increase between seven and twenty-three inches means that 10-50% of the freshwater marsh would be affected, causing changes to the entire ecosystem.[71] A study on

[69] ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, EXECUTIVE SUMMARY: RANKING OF THE WORLD'S CITIES MOST EXPOSED TO COASTAL FLOODING TODAY AND IN THE FUTURE (2007), available at http://www.oecd.org/dataoecd/16/10/39721444.pdf.

[70] *Id.*

[71] Everglades, Statement of Dan Kimball, Superintendent, Everglades National Park, National Park Service, Department of the Interior, Before the Subcommittee on Interior, Environment, and Related

coastal forests in the Florida Panhandle concluded that "cabbage palms and many other coastal trees are falling victim to saltwater exposure tied to global sea level rise."[72] The study also found that many of Florida's coastal forests are threatened because they are sandwiched between rising seas and residential development.[73] The forests are thus unable to migrate in the face of saltwater intrusion.

In addition to the environmental damage, SLR threatens Florida's economy as well. In 2005, 86 million tourists visited Florida, spending around $62 billion – the vast majority of which was spent visiting coastal and aquatic resources.[74] Encompassing both environmental and economic damage is the risk to infrastructure such as hospitals, nuclear reactors, nursing homes, water-treatment facilities, hazardous waste clean-up sites, hospitals, and airports.

Different predictions for SLR in Florida:

Location	2025	2030	2050	2080	2100	2200
Florida, generally					10.4" (90%)[75]	21" (90%)[76]
					19.8" (50%)[77]	44.2" (50%)[78]
					15"[79]	
Monroe County[80]		0.0845 m		0.310 m		
Escambia County[81]		0.0887 m		0.343 m		
Dade County[82]		0.0845 m		0.310 m		

Agencies of the House Appropriations Committee Concerning Climate Change and Lands Administered by the Department of the Interior (Apr. 26, 2007) http://www.nps.gov/ever/parknews/everclimatechangetestimony.htm.

[72] *Sea Level Rise Behind Tree Deaths on Florida's West Coast*, http://news.ufl.edu/1999/10/14/sea-rise/ (last visited Mar. 31, 2008).

[73] *Sea Level Rise Behind Tree Deaths on Florida's West Coast*, http://news.ufl.edu/1999/10/14/sea-rise/ (last visited Mar. 31, 2008).

[74] ROBERT R. TWILLEY, PEW CENTER ON GLOBAL CLIMATE CHANGE, COASTAL WETLANDS & GLOBAL CLIMATE CHANGE: GULF COAST WETLAND SUSTAINABILITY IN A CHANGING CLIMATE (Dec. 2007).

[75] Jeremy Cox, *Environmentalists Concerned State Lawmakers not Taking Threat of Sea-Level Rise Serious Enough*, Naples Daily News (Jan. 29, 2006), http://www.naplesnews.com/news/2006/jan/29/environmentalists_concerned_state_lawmakers_not_ta/?local_news.

[76] *Id.*

[77] *Id.*

[78] *Id.*

[79] Union of Concerned Scientists, http://www.ucsusa.org/gulf/gcstateflo_cli.html.

[80] HARRINGTON AND WALTON, *supra* note 19.

[81] *Id.*

Dixie County[83]		0.0714 m		0.275 m		
Duval County		0.0730 m		0.254 m		
Wakulla County[84]		0.0827 m		0.310 m		
Treasure Coast Region[85] (Indian River, St. Lucie County, Martin County, & Palm Beach County)	2.8" (90%)		5" (90%)		10.4" (90%)	53" (90%)

In addition to greater erosion of beaches due to rising sea levels, climate change may have other negative impacts on sea turtles as well. Warming may alter the sex ratio of sea turtle hatchlings.[86]

E. *Looking Forward*

Developing a rational vision for the future requires first looking to the experience of the past and the lessons it has, or should have, taught us. Florida has a long history of confronting shoreline migration where we have built permanent structures near the beach in Florida.[87] Early confrontations led to armoring,[88] often resulting in loss of the beach, its ecosystem and the human values associated with the beach. It has been estimated that more than 5,000 properties in Volusia and Brevard counties alone have been armored.[89] Local conditions may make armoring

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[82] *Id.*

[83] *Id.*

[84] *Id.*

[85] *SLR in TCR,* 4

[86] L.A. Hawkes, A.C. Broderick, M.H. Godfrey & B.J. Godley, *Investigating the potential impacts of climate change on a marine turtle population*, 13 GLOBAL CHANGE BIOLOGY, 923-932 (2007).

[87] For example, construction on Ft. Clinch began in 1843. By 1886 groins were constructed to arrest shoreline migration. Three subsequent major sets of shoreline protection structures have been built to protect the fort, as well as a beach nourishment project in 2001. DAVID M. BUSH, *ET AL.*, LIVING WITH FLORIDA'S ATLANTIC BEACHES: COASTAL HAZARDS FROM AMEILA ISLAND TO KEY WEST 1-2 (Duke University Press 2004).

[88] Armoring is defined as **"**a manmade structure designed to either prevent erosion of the upland property or protect eligible structures from the effects of coastal wave and current action. Armoring includes certain rigid coastal structures such as geotextile bags or tubes, seawalls, revetments, bulkheads, retaining walls, or similar structures but does not include jetties, groins, or other construction whose purpose is to add sand to the beach and dune system, alter the natural coastal currents, or stabilize the mouths of inlets.**"** FLA. ADMIN. CODE r. 62B-33.002(5).

[89] EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL, LAND USE IMPACTS AND SOLUTIONS TO SEA LEVEL RISE IN EAST CENTRAL FLORIDA 17 (2004), available at www.ecfrpc.org/Files/Projects/SEALEVEL_RISE_REPORT_11-04.pdf.

over the long-term infeasible as a strategy to address SLR.[90] As armoring increased, an additional way to protect human interests from shoreline migration and beach loss due to armoring developed: nourishment of the beach by adding more sand, which is usually dredged from an offshore location.

Nourishment has become the dominant beach policy management of Florida since the 1980s, and Florida statutes declare that approved beach nourishment projects are in the public interest.[91] Nourishment developed as the default coastal policy in Florida because it appeared to satisfy multiple interests. Property owners like that it protects their property; tourists enjoy large beaches; and proponents of environmental protection, including those interested in sea turtle nesting habitat, support nourishment despite lower nesting success on nourished beaches relative to natural beaches since decreased nesting success is better than losing the beach to sea walls. Recently, the wall of almost unanimous support for beach nourishment has begun to show cracks. Property owners whose property is being protected by beach nourishment have complained that nourishment violates their property rights,[92] and environmental interests have increasingly voiced concern about the environmental impacts of beach nourishment.[93]

Nourishment has also been undermined by recent coastal storms in Florida. The 2004 and 2005 hurricanes both removed large amounts of nourished beach and gave rise to a flurry of nourishment activity. While some nourished beaches fared reasonably well, others were rapidly lost, leading to questions about the financial feasibility of such an approach. Financial issues with nourishment will only multiply as the energy costs for nourishment increase. Even assuming available energy and funding for nourishment, we are running short of sand. South Florida has run out of readily-available sources of beach-quality sand, giving rise to talk of going as far as the Bahamas in search of sand.

Making matters yet worse, shoreline migration affecting human structures will only increase in the coming years as the rate of sea level rise increases in response to global warming. Arguably no solutions to SLR and human development exist, only differing management options. While many commentators have made valuable suggestions on management options, the best option

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[90] In many parts of Florida armoring to protect against SLR may not be possible. For example, scientists have noted that the porous limestone substrate in south Florida will not allow extensive reliance on dikes and levees to keep the water out. SCIENCE AND TECHNOLOGY COMMITTEE, MIAMI-DADE COUNTY CLIMATE CHANGE TASK FORCE, STATEMENT ON SEA LEVEL IN THE COMING CENTURY 4 (January 17, 2008).

[91] FLA. STAT. § 161.088 (2007).

[92] Save our Beaches v. , 937 So.2d 1099 (1st DCA, 2006). At first blush it seems bizarre that coastal property owners protected by beach nourishment would work so hard to stop beach nourishment. Some sources state that coastal property owners opposed to beach nourishment are worried that the "new" beach created by nourishment is public property, which results in the right of the public to use the beach in front of existing development that in many places claims to the right to exclude the public from the beach above the mean high water line. Current case law in Florida law allows a public right to the dry sand beach only in areas where such has been established by easement or by custom. **CITE**

[93] **REFERENCES ON HARD-BOTTOM IMPACTS**

from an economic and environmental perspective is to avoid the conflict by not placing human structures in the way of migrating beaches.

For much of Florida it is already too late to avoid the conflict between human development and migrating shorelines. This white paper suggests that even as we develop strategies to manage such conflicts, we must urgently seek to avoid incurring the tremendous costs and losses inherent in such conflict by preserving areas where allowing shoreline migration is most reasonable. Local government comprehensive planning should play a part in the effort to preserve areas where shorelines and their ecosystems may migrate naturally. Unfortunately, most current local government plans in Florida do not account for SLR in comprehensive planning.[94] While local governments may be the best poised to make difficult, site-specific decisions on how to address the conflicts between human development and natural beach migration, they may lack both resources and the political will to act. Part of the hesitancy of local governments to limit coastal development arises because local governments typically seek to maximize their revenue stream by permitting development that expands their ad valorem tax base.[95]

Local level impediments to action dictate looking also to the State for leadership and guidance in preservation of areas where shorelines may naturally migrate. Unfortunately, Florida's state regulatory system for coastal construction continues to allow rapid development in coastal areas. Private and public investment in infrastructure, new development in undeveloped areas, and increases in the density of existing development all limit the reasonable management options for future responses to sea level rise. For example, current and near-future development patterns and approvals often determine whether beaches that might have been allowed to migrate naturally at a lesser cost will instead need to be protected from sea level rise at far greater cost.[96] Florida's Coastal Construction Control Line should be modified to serve as an immediate first line of defense in maintaining an array of options for responding to SLR and concomitant shoreline migration without losing all of Florida's sandy beaches—and the myriad benefits and services they offer to humans and many other species.[97]

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[94] TREASURE COAST REGIONAL PLANNING COUNCIL, SEA LEVEL RISE IN THE TREASURE COAST REGION 36-37 (2005), available at www.tcrpc.org/special_projects/TCRPC%20SLR%20Report%2012-05-05.pdf; EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL, LAND USE IMPACTS AND SOLUTIONS TO SEA LEVEL RISE IN EAST CENTRAL FLORIDA 2 (2004).

[95] *Cf.* JUSTIN R. PIDOT, COASTAL DISASTER INSURANCE IN THE ERA OF GLOBAL WARMING: THE CASE FOR RELYING ON THE PRIVATE MARKET 35-37 Georgetown Environmental Law & Policy Institute (2007).

[96] *Cf.* TREASURE COAST REGIONAL PLANNING COUNCIL, SEA LEVEL RISE IN THE TREASURE COAST REGION (2005), available at www.tcrpc.org/special_projects/TCRPC%20SLR%20Report%2012-05-05.pdf.

[97] In addition to Florida's Coastal Construction Control Line program, federal law and programs (Coastal Zone Management Act; Coastal Barrier Resources Act; Federal Emergency Management Act; National Flood Insurance Program) as well as other state laws—especially comprehensive planning law—must form part of any integrated, long-term strategy to protect the future of our dynamic beaches.

The calculus that past has demonstrated seems clear: Coastal development and manipulation + beach dynamics = armoring or nourishment. Both results have their limitations from economic and ecological perspectives, and armoring combined with SLR will eliminate nesting habitat for sea turtles. In addition, SLR, depending on its speed and magnitude, could potentially trump both nourishment and armoring. The safest—and likely least-cost long-term course of action involves relocating human development back from the beach. Changing our calculus will require careful consideration of existing federal, state, and local policies followed by careful integration of new policies to promote dynamic beaches.

II. Federal Policies Affecting Florida Beaches

A. *The Coastal Zone Management Act*

The federal Coastal Zone Management Act[98] (CZMA) was designed to encourage states to develop coastal management plans that identify the coastal zone, develop permit programs for land uses within the coastal zone, planning for public access to beaches, a planning process for studying coastal erosion and ways to control it, and set broad priorities for uses within the coastal zone.[99] Once a state's plan is approved, the state qualifies for federal funding to assist in implementation of the plan and qualifies to apply for other federally-available funds.

The CZMA repeatedly refers to sea-level rise (SLR). The Federal Coastal Zone Management Act sets forth: "Because global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence."[100] The CZMA also states that coastal management programs should provide for management that reduces the loss of life and property from SLR,[101] the study and development of plans to address SLR,[102] and "encourage[ment of] the preparation of special area management plans… including those areas likely to be affected by land subsidence, sea level rise."[103] Approval of a state's coastal zone management plan requires consistency with these policy statements.[104] In addition, the CZMA allows additional grants to states to help them develop

[98] 16 U.S.C. §§ 1451-1456 (2007).

[99] *See,* Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service, available at www.fws.gov/laws/lawsdigest/COASZON.HTML. In addition, the United States is a party to the United Nations Framework Convention on Climate Change, which sets forth as a commitment of the parties to develop "appropriate and integrated plans for coastal zone management." The United Nations Framework Convention on Climate Change, GE.05-62220 (E) 200705 (1992), Art. 4, Sect. 1(e), *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf.

[100] Federal Coastal Zone Management Act, 16 U.S.C. § 1451(l).

[101] 16 U.S.C. § 1452(2)(B).

[102] 16 U.S.C. § 1452(2)(K).

[103] 16 U.S.C. § 1452(3).

[104] 16 U.S.C. § 1455(d)(1).

policies that prevent or significantly reduce "threats to life and destruction of property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and *anticipating and managing the effects of potential sea level rise. . .*"[105]

Florida's Coastal Management Program (FCMP) was approved in 1981 and is codified in Chapter 380 of the Florida Statutes.[106] In addition, the FCMP consists of portions of twenty-three different statutes.[107]

Nonetheless, it is unclear that the FCMP adequately fulfills the objectives of the CZMA. For example, "While every county in Florida includes a Recovery Annex in its Comprehensive Emergency Management Plan, most cities and counties have not adopted a formal PDRP [post-disaster recovery plan] that addresses recovery operations and policies intended to guide post-disaster reconstruction and redevelopment decision making."[108] Can a lack of a PDRP and lack of prohibitions on rebuilding possibly ensure the CZMA's goal of steering development and redevelopment away from high-hazard areas? Additionally, the FCMP has failed to seek to reduce the loss of life and property due to SLR through anticipating SLR and studies on how to address the threats of SLR. To the contrary: Parts of the FCMP, such as the Coastal Construction Control Line permitting program, allow development to continue and increase in areas without regard to the potential effects of SLR. The weaknesses of Florida's Coastal Construction Control Line program are discussed below. Thus, the FCMP appears not to effectively implement some of the goals of the CZMA.

B. *Coastal Barrier Resources Act*

Established in 1982, the federal Coastal Barrier Resources Act (CBRA) recognizes that barrier islands play an important role in protecting the mainland form the wind, wave, and tidal energy of the ocean.[109] CBRA created a system that identified various uninhabited coastal barrier

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[105] 16 U.S.C. § 1456b(a)(2) (emphasis added).

[106] FLA. STAT. §§ 380.20 through 380.285 (2007).

[107] A list of these statutes and links to them is available on a Florida DEP website at www.dep.state.fl.us/cmp/federal/23_statutes.htm.

[108] Florida Coastal Management Program, Final Assessment and Strategies: FY 2006-2010, page 11.

[109] The CBRA states:

> The Congress declares that it is the purpose of this chapter to minimize the loss of human life, wasteful expenditure of Federal revenues, and the damage to fish, wildlife, and other natural resources associated with the coastal barriers along the Atlantic and Gulf Coasts and along the shore areas of the Great Lakes *by restricting future Federal expenditures and financial assistance which have the effect of encouraging development of coastal barriers*….
>
> Coastal Barrier Resources Act, 16 U.S.C. § 3501(b) (2007) (emphasis added).

islands. Adopting a subsidy-denial approach, CBRA restricts the use of federal funds for construction of roads, bridges, structures, boat-landing facilities, or causeways to identified coastal barrier islands.[110] In addition, CBRA prohibits use of federal funds for erosion control projects on specified barrier islands. Exceptions to many of these limitations exist. For example, non-structural erosion control activities utilizing vegetation buffers are permitted. CBRA also prohibits use of the National Flood Insurance Program or HUD funding to support projects on barrier islands within the Coastal Barrier Island System.

CBRA prohibitions on funding affect several areas in Florida.[111] Cape San Blas, Florida, is a designated Coastal Barrier Resources System unit to which this prohibition applies, and since its designation in 2000, the absence of federal flood insurance coupled with rising private insurance rates have contributed to both a decrease in property values and a decrease in tourism.[112] Despite CBRA's denial of federal funds to subsidize development on Cape San Blas, the State of Florida is not limited by any such policy and has committed almost $13 million of state funds to beach nourishment in the area for the period from 2005 to 2008. In addition to its purpose being undermined by such state action, a macroscopic study of the CBRA's efficacy in preventing coastal development revealed that the Act typically does little to discourage development because of local interest in development and the availability of private insurance.[113]

C. *Perverse Incentives: FEMA and the National Flood Insurance Program*

Despite the effort of CBRA to prevent subsidies to coastal development, conflicting policy expressed by the Federal Emergency Management Agency and its National Flood Insurance Policy do subsidize coastal development.

Policies related to disasters such as flooding and hurricanes must balance two distinct goals: first is the goal of promoting actions to mitigate, both physically and financially,[114] losses that occur as a result of a disaster, and second, to give assistance to those hurt by a disaster.[115] This

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[110] GOVERNMENT ACCOUNTABILITY OFFICE, COASTAL BARRIER RESOURCES SYSTEM: STATUS OF DEVELOPMENT THAT HAS OCCURRED AND FINANCIAL ASSISTANCE PROVIDED BY FEDERAL AGENCIES 2 (March 2007) GAO-07-356.

[111] For example, east central Florida has nine CBRA areas, and some of these will likely be allowed to migrate naturally with sea-level rise and erosion while some areas may still be protected with or without federal funds. EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL, LAND USE IMPACTS AND SOLUTIONS TO SEA LEVEL RISE IN EAST CENTRAL FLORIDA 20 (2004), available at www.ecfrpc.org/Files/Projects/SEALEVEL_RISE_REPORT_11-04.pdf.

[112] GOVERNMENT ACCOUNTABILITY OFFICE, COASTAL BARRIER RESOURCES SYSTEM: STATUS OF DEVELOPMENT THAT HAS OCCURRED AND FINANCIAL ASSISTANCE PROVIDED BY FEDERAL AGENCIES (March 2007) GAO-07-356.

[113] *Id.*

[114] Physical mitigation includes building to withstand a disaster or relocating to avoid the disaster while financial mitigation includes insuring against the losses caused by a disaster.

subsection assesses the Federal Emergency Management Agency and National Flood Insurance Programs through the lens of the need to balance mitigation and post-disaster assistance.

Since 1980, development along Florida's coasts has increased by more than 60%, reflecting a nationwide trend of homeowners and property developers flocking to the coasts.[116] The ability of coastal developers and homeowners to obtain federal, state, and local subsidies for property insurance, post-disaster relief, and reinforcement structures is a determinative factor in the population explosion along the coast.[117] Coastal living unquestionably entails high-risk exposure to property damage, a cost that is often prohibitive without these various subsidies.

By providing these subsidies to coastal property owners, however, the government transfers a large portion of these costs to taxpayers who neither live near the beach nor enjoy the benefits of living near the beach. Government intervention in the insurance market allows those that take the risk of living along the coast to externalize the cost of coastal risk. Federal and state subsidies constitute both implicit and explicit governmental endorsement[118] of development in high-risk coastal areas, exacerbating the human loss and damage suffered after a severe weather event.

The interaction between the availability of these subsidies and developers creates a positive feedback loop with negative financial and ecological consequences. This loop spawns further development; further development increases the political influence of these coastal communities, which in turn perpetuates further subsidies, leading to increased development.[119] Supplemented

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[115] Ernest Abbott, Floods, Flood Insurance, Litigation, Politics – and Catastrophe: The National Flood Insurance Program, presentation at The National Sea Grant Law and Policy Journal Inaugural Symposium, Oxford, Mississippi, March 26, 2008, presentation available at http://www.olemiss.edu/orgs/SGLC/National/SGLPJ/SGLPJ.htm.

[116] Wayne T. Price, *Healthy Beaches Benefit Communities, Lure Newcomers,* FLA. TODAY (July 28, 2002) at 7S. Development along the United States' coasts has been attributed to various factors, including relatively calm hurricane seasons during the 1990's and the increased spending power and wealth of recently retired baby-boomers. *See* Daniel B. Barnhizer, *Givings Recapture: Funding Public Acquisition of Private Property Interests on the Coasts,* 27 HARV. ENVTL. L. REV. 295, 309-11 (2003).

[117] A recent survey of community developers concluded that the availability of NFIP insurance is a "significant consideration" in property purchases. This survey also recognized that the mere availability of NFIP insurance lowers the insurance rates in the entire coastal area. Walter A. Rosenbaum & Gary W. Boulware, *The Developmental and Environmental Impact of the National Flood Insurance Program: A Summary Research Report* 68 (Oct. 2006), American Institutes for Research.

[118] *See* Barnhizer, *supra* note 116 (arguing that in considering the just compensation due to coastal property owners who have suffered a compensable regulatory taking under the Fifth Amendment, government subsidies should count as government "givings," actions by the government that have increased the property value, which should be deducted from the amount of total compensation).

[119] As noted by one scholar:

> Flood control projects merely buy time. It has been observed that there are two types of levees: Those that have failed, and those that will. Thus, the government has been obliged to offer post-disaster assistance in the form of loans and grants to flood

by post-disaster relief, this feedback loop also creates a firm belief that, after an extreme but not unexpected weather event, the government will bail out the property owners who have ostensibly "lost everything." Government actions sustain this belief, and coastal property owners build with the conviction that the government will indeed provide the financial relief to rebuild.

D. *Overview of the NFIP*

After the 1927 Mississippi River flood, many private insurers eliminated private flood insurance,[120] leaving a gap that the federal government eventually filled by passing the National Flood Insurance Act and later creating the National Flood Insurance Program (NFIP) in 1968.[121] Congress recognized that while private insurance companies could not provide flood insurance at a profit, government supplementation and participation could assist in providing flood insurance through the private market.[122] Since the creation of the NFIP, private insurers—with the exception of some boutique insurance companies—have mostly abandoned flood insurance.[123]

Forty years after its creation, the NFIP is a continual target of criticism, particularly in light of the devastating hurricane seasons in 2004 and 2005. Critics frequently cite the NFIP's lack of actuarial soundness as irresponsible financial management.[124] At best, the NFIP seeks solvency, using the premiums to fund the losses.[125] In addition, the flood maps upon which the rates are based are inadequately maintained and often do not reflect the current or accurate risk of a

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> victims. This points to a self-destructive pattern that has long characterized flood mitigation efforts. As flood-control works are brought online, the value of once – and future – flood-ravaged lands increases. Residential and commercial development… are attracted, often resting on long-term assumptions about the suitability of the area for development.

Adam Scales, *A Nation of Policyholders: Governmental and Market Failure in Flood Insurance*, 26 MISS. COLL. L. REV. 3, 6 (2007).

[120] Prior to the 1927 Mississippi River flood, private insurance was widely available through accident or fire policies. Scales, *supra* note 119, at 7.

[121] National Flood Insurance Act, 42 U.S.C. §§ 4001-128 (2007).

[122] Id. § 4001(b).

[123] PIDOT, *supra* note 95. The NFIP provides insurance to states or areas that have "evidenced a positive interest in securing flood insurance" and have "adopted and will enforce satisfactory land use and control measures." 42 U.S.C. § 4012(c). Insurance rates and required mitigation measures are determined by 100-year floodplain maps, which are produced by FEMA. Private insurers continue to provide coverage for *wind* damage in property insurance. This division between flood and wind insurance is addressed below.

[124] Christine M. McMillan, *Federal Flood Insurance Policy: Making Matters Worse*, 44 HOUS. L. REV. 471, 497 (2007) (commenting that at best, the NFIP fails to discourage construction in vulnerable areas; at worst, the NFIP "actively promotes improper land use decisions" that further endanger people and property).

[125] *Id.* at 495. The NFIP receives continual and guaranteed federal funding, meaning that the actual cost of its policies is not internalized for redistribution among policyholders.

particular location.[126] The NFIP's myopic focus on floods ignores factors such as wind or erosion that exacerbate flood damage.[127] That private insurers are generally unwilling to assume these high-risk coastal properties indicates a lack of actuarial unsoundness in the rates charged by the NFIP. Financial criticisms of the program seem appropriate in light of the program's current $17 billion debt.[128]

Upon creation of the NFIP, it was assumed that high-risk properties would eventually disappear.[129] Reality has not supported such an assumption. The NFIP suffers significant financial losses from repetitive-loss payments. For example, in 2004, Congress reported that 1% of insured properties amounted to 25-30% of the payouts due to the multiple rebuilding of the same properties.[130] These multiple payments and bail-outs by the government encourage coastal property owners to rely on government subsidies and to remain in high-risk areas that are predictably and repeatedly damaged by severe weather events. Finally, the NFIP lacks sufficient enforcement authority to control the construction or reconstruction of structures in flood-prone areas. While NFIP insurance may depend on enactment of certain building codes, these codes are passed and enforced by local governments and zoning boards, who may be more sympathetic to their friends and neighbors in the local community than to federal regulations.[131] The NFIP lacks the enforcement power over building requirements.[132]

It seems axiomatic to state that federal and state policies should not encourage high-risk behavior through subsidies paid by all when the benefits of the high-risk behavior go to only a tiny minority. Yet such seems to be federal policy as expressed through the National Flood Insurance Program and other programs of the Federal Emergency Management Agency.

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[126] *Id.* at 495.

[127] *Id.* Singularly insuring against floods means that the NFIP cannot distribute this high-risk event across lower-risk events.

[128] Ernest Abbott, Floods, Flood Insurance, Litigation, Politics – and Catastrophe: The National Flood Insurance Program, presentation at The National Sea Grant Law and Policy Journal Inaugural Symposium, Oxford, Mississippi, March 26, 2008, presentation available at http://www.olemiss.edu/orgs/SGLC/National/SGLPJ/SGLPJ.htm.

[129] *Id.* at slide 7.

[130] In 2004, Congress found that the National Flood Insurance Program "makes flood insurance available on a nationwide basis that would otherwise not be available." Pub. L. No. 108-264, 118 Stat. 712 (2004). At that time, the NFIP insured approximately 4.4 million policyholders, of which approximately 48,000 properties had experienced two or more flood losses in a ten-year period where the loss exceeded $1000. *Id.* § 2(3). Overall, the total cost of repetitive losses approached $200 million. *Id.* § 2(5). The 2004 law developed a pilot program to reduce repetitive losses by identifying repetitive loss properties, offering to purchase them, and charging actuarial rates (no longer eligible for subsidized rates) if the offer is refused. *Id.* Information is a available at http://www.fema.gov/government/grant/srl/.

[131] In addition, local governments frequently suffer from a lack of political will to pass and enforce strict limitations on building along the coast because the local government may want to maximize property values as this fills the local governments coffers through increased property tax revenue.

[132] McMillian, *supra* note 124, at 500.

E. *The Wind-Water Distinction*

One of the most contentious and highly litigated issues after Hurricane Katrina is the wind-water distinction between private homeowner's insurance and federal flood insurance.[133] The 1.75 million insurance claims amounted to $41.1 billion in total payments, $17.5 billion of which the National Flood Insurance Program had to borrow from the Treasury. For coastal areas prone to hurricanes,[134] this wind-water distinction is particularly salient since homeowner's insurance provided by private companies often covers wind damage and specifically excludes water damage.[135] "The private market's inability and refusal to insure flood risks other than through the subsidies provided by [the federal program] have not changed."[136] Thus, private insurers have an incentive to assert that damage was caused by water, not by wind, since water damage is covered by the NFIP and not the private insurer.

In the litigation arising from this wind-water distinction, private insurance companies have generally prevailed as courts have upheld flood exclusions in insurance policies.[137] Homeowners' suits fall into three broad categories: (1) the ambiguity of the flood exclusion provision renders it inapplicable to flooding caused by wind; (2) the homeowner reasonably expected the flood exclusion did not apply to wind-driven floods; and (3) the flood exclusion is unconscionable and void as against public policy.[138] Some homeowners also argue that the

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[133] *See* Jennifer Bayot, *Liability Issue: Wind or Water?*, N.Y. Times (Sept. 8, 2005). http://www.nytimes.com/2005/09/08/business/08insure.html?_r=1&oref=slogin; Christine Dugas & Mindy Fetterman, *State Farm's Katrina Deal Changes 'Wind vs. Water' Equation*, USA Today (Jan. 24, 2007) http://www.usatoday.com/money/industries/insurance/2007-01-24-state-farm_x.htm; and Emanuel Levy, *Water vs. Wind: The Coverage Dilemma*, Rough Notes (July 2007), *available at* http://findarticles.com/p/articles/mi_qa3615/is_200707/ai_n19434402.

[134] Florida is particularly vulnerable. Data compiled by the National Oceanic and Atmospheric Administration (NOAA) on the 30 most powerful storms over the period 1900 to 1996 show that more than 40 percent of the damage they caused occurred in southeast Florida. Of the 158 hurricanes that hit the United States, 47 hit Florida and 26 of those struck the Southeast Florida coast. Insurance Information Institute, http://www.iii.org/media/hottopics/insurance/catastrophes/.

[135] James A. Knox, Jr., *Causation, The Flood Exclusion, and Katrina*, 41 Tort Trial & Ins. Prac. L.J. 901, PAGE (2006). An alternative insurance policy is the named-peril insurance, which covers losses caused by a specifically named peril and not excluded in the policy. *Id*. Typical policies cover windstorm damage but exclude water damage from flood, surface water, waves, tides, tidal waves, overflow of any body of water, or water spray – whether driven by wind or not. *Id.* at 909.x

[136] James A. Knox, Jr., *Causation, The Flood Exclusion, and Katrina*, 41 Tort Trial & Ins. Prac. L.J. 901, 909 (2006).

[137] *See, e.g.* In re Katrina Canal Breaches Litigation, 495 F.3d 191 (5th Cir. 2007) (in an action by insurance holders to recover for damaged occasioned by breached levees in the aftermath of Hurricane Katrina, upholding the flood exclusion in insurance policies to preclude insurance payments even if the insurance policy did not define the term).

[138] James A. Knox, Jr., *Causation, The Flood Exclusion, and Katrina*, 41 Tort Trial & Ins. Prac. L.J. 901, 911-12 (2006).

insurance agent was negligent in failing to inform the homeowners that they needed flood insurance or in explicitly telling the homeowners that they did not need flood insurance, but such claims typically do not succeed.[139]

The current policy dialogue centers on ways to bridge the gap in insurance coverage. While many agree that multi-peril insurance would solve the insurance gap, the controversy lies in which actor – private insurers or the federal or state government – should bear the burden of this insurance. Eli Lehrer of the Competitive Enterprise Institute concludes that "[t]he United States faces a logic that leads either to all private or all public property insurance. Anything in between is becoming untenable."[140] Among his proposals to create incentives for the private market to adopt the multi-peril insurance business are: (1) reducing regulation on insurance companies that market securities to back insurance policies; (2) broadening markets for private insurers to distribute risk by operating under a federal regulatory scheme to allow interstate sales of insurance; and (3) improving tax treatment of money set aside for catastrophes and reinsurance.[141] While no immediate solutions exist, at the very least these proposals do not "expose taxpayers to massive new liabilities" that would result from expansion of the current federal flood insurance program.

H.R. 3121 is a proposed amendment to the NFIP that creates multi-peril insurance, which would cover "losses only from physical damage resulting from flooding or windstorm…."[142] The amendment would also "provide for approval and payment of claims…[that] have resulted from either windstorm or flooding" but does not require proof of the specific cause of the loss.[143] This bill is a direct response to the wind-water litigation arising from post-Katrina claims. In September 2007, the bill was referred to the Senate committee; however, the Bush Administration "strongly opposes"[144] federal involvement in wind insurance, and the votes in the House fell nine short of the number required to override a presidential veto.[145] The Administration stated:

> Shifting liabilities for windstorm damage from the private sector to the NFIP would be fiscally irresponsible. Federal government insurance would displace insurance that is already provided by the private market. Expansion of the NFIP would also undermine economic incentives to mitigate risks because the program would likely distort rates from their market-determined values. Individuals would

[139] *See, e.g.* Leonard v. Nationwide Mutual Insurance, Co., 438 F.Supp. 2d 684 (S.D. Miss. 2006), *aff'd*, 499 F.3d 419 (2007).

[140] Eli Lehrer, *Reaping the Whirlwind: Mississippi's Insurance Problem is Everybody's*, Weekly Standard (Mar. 26, 2007), available at http://www.cei.org/gencon/019,05825.cfm.

[141] Eli Lehrer, *A Disaster in the Making*, Weekly Standard (Feb. 4, 2008).

[142] H.R. 3121 §7(4)(A), (B).

[143] H.R. 3121 §7(4)(b).

[144] Executive Office of the President, *Statement of Administration Policy* (September 26, 2007).

[145] http://www.iii.org/media/hottopics/insurance/catastrophes/.

> be encouraged to take on risks that are inappropriate, putting themselves in harm's way because they would not have to bear the full costs of any subsequent damages. Finally, the inclusion of windstorm damage insurance in the NFIP would mean that all taxpayers would be subsidizing insurance rates for the benefit of those people in high-risk areas.

It is interesting to note that all of these criticisms have been leveled at the existing NFIP.

The advantages of multi-peril insurance are clear. Such insurance would eliminate gaps in existing insurance coverage; would spread risks geographically; would eliminate legal battles over the cause of damage; and would include risks generally considered uninsurable.[146] Pre-disaster insurance would limit the immediate need for expensive post-disaster government aid.[147] Moreover, *mandatory* multi-peril insurance would ensure homeowners' participation in catastrophe insurance programs, potentially helping to secure the financial soundness of the insurance industry.

The disadvantages of and obstacles to mandatory multi-peril insurance are equally clear. Proposals to create multi-peril insurance in the private industry or by the federal government generate vocal opposition from many sectors, and solvency, much less profitability, most likely requires a fundamental restructuring of the insurance industry. Enforcing and pricing mandatory multi-peril insurance would also be problematic, causing significant increases in premiums. For low-income households, some form of financial assistance to comply would be necessary.[148]

F. *Disaster Relief Act*[149]

Another primary form of federal government subsidy stems from the Robert T. Stafford Disaster Assistance and Emergency Relief Act.[150] Under the Act, the Federal Emergency Management Agency (FEMA) has created three categories of aid: individual and household aid; public aid, including state, local, and tribal governments and some non-profit organizations; and hazard mitigation assistance.[151] The Act has firmly established the role of Presidential Declarations of

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[146] GOVERNMENT ACCOUNTABILITY OFFICE, NATURAL DISASTERS: PUBLIC POLICY OPTIONS FOR CHANGING THE FEDERAL ROLES IN NATURAL CATASTROPHE INSURANCE 36 (Nov. 2007), GAO-08-7.

[147] *Id.*.

[148] *Id.* at 37.

[149] 42 U.S.C. §§ 5121-5206 (2007).

[150] This Act was passed in response to a series of natural disasters: Hurricane Carla hit in 1962, Hurricane Betsy in 1965, Hurricane Camille in 1969, and Hurricane Agnes in 1972. The Alaskan Earthquake struck in 1964, and the San Fernando Earthquake struck in 1971. *FEMA History*, available at http://www.fema.gov/about/history.shtm (last visited October 2, 2007).

[151] KEITH BEA, FEDERAL STAFFORD ACT DISASTER ASSISTANCE: PRESIDENTIAL DECLARATIONS, ELIGIBLE ACTIVITIES, AND FUNDING (Aug. 29, 2005), Congressional Research Service, Report for Congress, available at www.fas.org/sgp/crs/homesec/RL33053.pdf.

Emergency as a primary means of coordinating the federal disaster response,[152] but critics argue that disaster relief and the Act have "burgeoned into a massive entitlement program," relieving states and localities of their primary disaster response roles.[153] Coupled with the National Flood Insurance Program and other subsidies, the Act lulls coastal property owners into believing that federal government will always be a safety net for whatever natural disasters may occur.[154] Such perceptions demonstrate that the struggle between promoting physical and financial mitigation and giving aid after a disaster has dramatically shifted to giving aid after a disaster.

G. *The Upton-Jones Amendment: Failure of An Effort to Bring Balance*

Prior to the 1987 Upton-Jones amendment,[155] the NFIP paid only claims for actual damage. The Upton-Jones amendment allowed homeowners of flood-threatened property to use payments from the National Flood Insurance Program to relocate or demolish their homes.[156] The amendment directed that, for applications for demolition, the owner shall be paid 40 percent of the value of the home upon certification that a structure insured by the NFIP is subject to imminent collapse or subsidence as a result of waves or water currents, the remaining 60 percent upon actual demolition of the home, plus 10 percent of the value of the home or the cost of demolition, whichever is less.[157] If the owner chooses relocation, the owner may be paid up to 40 percent of the value of the home, but the payment shall not exceed the actual cost of relocation.[158] For both demolition and relocation, if the structure has been certified in danger of imminent collapse or subsidence and does collapse before demolition or moving, the owner shall receive not more than 40 percent of the structure's value if it is determined that the owner did not take reasonable steps to demolish or relocate the structure.[159] "Subject to imminent collapse" is defined as a structure that is located seaward of a line that is ten feet plus five times the local

[152] FEMA History, *supra* note 150.

[153] Barnhizer, *supra* note 116, at 328. Note that dramatically reducing the fiscal responsibility of state and local governments in emergency response furthers the incentives of state and local governments to promote development from which the state and local governments profit even as they do not pay the full costs for such development when predictable coastal storms strike.

[154] Barnhizer, *supra* note 116**Error! Bookmark not defined.**, at 328.

[155] Housing and Community Development Act of 1987 (PL 100-242).

[156] ORRIN H. PILKEY, THE NORTH CAROLINA SHORE AND ITS BARRIER ISLANDS: RESTLESS RIBBONS OF SAND 207 (Duke University Press)

[157] Pub. Law 100-242, 1988 S 825, sec. 544.

[158] *Id.*

[159] *Id.*

average annual shoreline recession rate.[160] Applicants may also submit scientific or technical data to establish a "unique or highly unstable condition" on the property.[161]

> If any structure covered by [NFIP insurance] and located on land along the shore of a lake or other body of water is certified by an appropriate State or local land use authority to be subject to imminent collapse or subsidence as a result of erosion or undermining caused by waves or currents of water… the Director shall…pay… for proper demolition… 40 percent of the value of the structure and following demolition… prior to collapse, the remaining 60 percent of the value of the structure and 10 percent of the value of the structure, or the actual cost of demolition, whichever amount is less[;] for proper relocation… prior to collapse, up to 40 percent of the value of the structure.[162]

Notable as the "first federal use of erosion setbacks as a tool for preventive management as part of an insurance program,"[163] the amendment was proposed in response to record high lake-levels in Michigan. These lake levels caused many houses along the Great Lakes to fall into the water, posing safety and debris hazards.[164] Meanwhile, beach cottages in North Carolina were facing collapse into the ocean.[165] Thus, the amendment was proposed by House representatives from these two states.[166]

By August 1989, the National Academy of Science (NAS) determined that 266 claims had been filed under the Upton-Jones amendment, with claims from North Carolina and Michigan accounting for more than 100 of the total claims. 188 of the 266 claims were coastal claims, including five coastal claims from Florida.[167] From this limited and preliminary data, the NAS extrapolated several reasons for the low number of claims. First, many states required sufficient structural damage for condemnation of the building before certification could take place.[168] The NAS also determined that owners of threatened property were often unaware of the amendment and procedures for filing claims. In addition, the affordability, availability, and suitability of property for relocation limited the opportunity for relocation.[169] Finally, and maybe most

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[160] COMMITTEE ON COASTAL EROSION ZONE MANAGEMENT, NATIONAL RESEARCH COUNCIL, MANAGING COASTAL EROSION 80 (1990).

[161] *Id.*

[162] Pub. Law 100-242, 1988 S 825.

[163] A CHRONOLOGY OF MAJOR EVENTS AFFECTING THE NATIONAL FLOOD INSURANCE PROGRAM 44 (October 2002).

[164] *Id.* at 52.

[165] COMMITTEE ON COASTAL EROSION ZONE MANAGEMENT, NATIONAL RESEARCH COUNCIL, MANAGING COASTAL EROSION 79 (1990).

[166] *Id.*

[167] *Id.* at 84.

[168] *Id.* at 84.

[169] *Id.* at 84.

importantly, the interim regulations defining "imminent collapse or subsidence" were too restrictive; in areas with low average annual erosion, a structure might be destroyed by a major storm event before qualifying as in danger of imminent collapse or subsidence, thus making orderly demolition or relocation impossible.[170]

> The NAS concluded that the Upton-Jones amendment added:
>
> [an] important new capability to the NFIP…. [B]enefits are available to insured property owners before an actual loss occurs…. The opportunity is thus provided for structures to be removed from erosion-prone locations – by demolition or relocation – in an orderly manner and with minimum threat to public safety or private investment. This anticipatory approach should help reduce public and private costs related to erosion.[171]

The NAS recommended that FEMA expand upon the narrow definition of imminent collapse and eliminate NFIP insurance or significantly increase insurance premiums for structures classified in the "zone of imminent collapse."[172]

Six years after its passage, the Upton-Jones amendment was repealed and replaced by the Mitigation Assistance Program (MAP).[173] Possible reasons for the repeal include pricing concerns, limited impact, and lack of a companion erosion management program.[174] While the MAP retains the demolition and relocation options,[175] it expands federal funding for mitigation projects including acquisitions, elevations, minor localized flood control projects, and beach nourishment activities.[176] MAP also provides funding for planning and technical assistance grants.[177] In doing so, the MAP seeks to ultimately "reduce or eliminate claims under the

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[170] *Id.* at 87.

[171] *Id.* at 86.

[172] *Id.* at 87.

[173] A CHRONOLOGY OF MAJOR EVENTS AFFECTING THE NATIONAL FLOOD INSURANCE PROGRAM (October 2002); Pub. Law 103-125.

[174] FEDERAL EMERGENCY MANAGEMENT AGENCY, PROJECTED IMPACT OF RELATIVE SEA LEVEL RISE ON THE NATIONAL FLOOD INSURANCE PROGRAM (October 1991), available at http://www.epa.gov/climatechange/effects/downloads/flood_insurance.pdf; GOVERNMENT ACCOUNTABILITY OFFICE, CLIMATE CHANGE: AGENCIES SHOULD DEVELOP GUIDANCE FOR ADDRESSING THE EFFECTS ON FEDERAL LANDS AND WATER RESOURCES 133 (Aug. 2007) GAO-07-863, *available at* www.gao.gov/new.items/d07863.pdf.

[175] In 2004, amendments added the Severe Repetitive Loss Program to FEMA; the Severe Repetitive Loss Program again offers funding for acquisition and relocation of at-risk structures. *See* http://www.fema.gov/government/grant/srl/.

[176] FEDERAL EMERGENCY MANAGEMENT AGENCY, FY 2008 FLOOD MITIGATION ASSISTANCE PROGRAM GUIDANCE, page v, *available at* http://www.fema.gov/library/viewRecord.do?id=3027.

[177] *Id.*

[NFIP] through mitigation activities.[178] Addition of beach nourishment has had a dramatic effect as large amounts of FEMA money now routinely pay for beach nourishment projects instead of looking towards longer-term management options.[179]

Between 1993 and 1998, FEMA reported that it had committed more than $204 million to relocate 19,000 properties out of flood hazard areas.[180] In its overall evaluation of federal mitigation activities, the Government Accountability Office (GAO) reported a general reluctance by state and local governments to implement mitigation projects.[181] Reasons for the reluctance included local sensitivity to measures such as building code enforcement and land-use planning, conflict between mitigation projects and development goals, a lack of political support for and understanding of mitigation, and the perception that mitigation is costly, highly technical, and complex.[182] In addition, distorted comparisons – or the lack of accurate bases for comparison – between the benefits of mitigation and the cost of losses skewed perceptions of mitigation projects.[183]

The GAO report also concluded that individuals' perceptions of flood risk as sufficiently low resulted in a tendency to ignore the need to undertake mitigation activities.[184] The report noted some research that "the availability of federal relief inhibits actions that would mitigate losses from disasters." Thus, post-disaster relief may undermine effective use of pre-disaster mitigation funds.[185]

Thus, the effort to spend federal funds on mitigation versus disaster assistance continues, even as the supposed mitigation efforts of insurance through the NFIP appear at best grossly inefficient and at worst, counterproductive by promoting development in high-risk areas.

H. *Possible Limitations on the National Flood Insurance Program*

[178] 44 C.F.R § 78.1 (2008). Mitigation projects must be cost-effective; conform with existing environmental regulations and NFIP Floodplain Management regulations; and must be physically located in a community that is not on probation or must directly benefit the community by reducing future flood damages. 44 C.F.R. § 78.11 (2008).

[179] *See, e.g.* Natural Resource Management Office, Brevard County, Florida **"**Dune Maintenance – 2006: Repairing Damage After Wilma**"** (noting that 75% of the $5.7 million cost of one dune maintenance project was shouldered by FEMA) *available at* http://www.brevardcounty.us/environmental_management/bbbb_dm_rep_wilma.cfm

[180] GAO/T-RCED-98-67, Testimony Before the Subcommittee on Water Resources and Environment, Committee on Transportation and Infrastructure, House of Representatives, *Disaster Assistance: Information on Federal Disaster Mitigation Efforts* 6 (Jan. 28, 1998) [hereinafter GAO Report].

[181] GAO Report at 3.

[182] *Id.*

[183] *Id.*

[184] *Id.* at 4.

[185] *Id.*

A change may be on the horizon, though, for the NFIP's ability to promote development in high-risk areas. Issuance of policies under the NFIP has been halted in one area due to the requirements of the Endangered Species Act (ESA). In *Florida Key Deer & Nat'l Wildlife Fed. v. R. David Paulison*,[186] the court upheld an injunction against issuance of new NFIP flood policies in the Florida Keys since issuance of such policies could threaten the endangered Florida Keys Deer. The court stated that the ESA clearly does apply to the NFIP,[187] that actions previously taken by FEMA in administration of the NFIP did not fulfill the requirements of the ESA,[188] and upheld an injunction against new NFIP policies in Monroe County until such time as FEMA's NFIP complies with the ESA.[189] It may be possible that similar arguments could prevent issuance of new NFIP policies in sea turtle nesting habitat that is being lost between development and migrating shorelines.

I. *The Endangered Species Act: Is there a State-wide HCP in Florida's Future?*

When rising seas and eroding coastlines threaten human development, armoring of the coast often results. When armoring frequently interacts directly with waves or allows very little dry sand beach, turtle nesting habitat is lost. Absent armoring or coastal construction, a rising sea level and eroding shoreline simply lead to the beach migrating landward. Thus, the activity that leads to destruction of coastal habitat is coastal development and coastal armoring. Protecting sea turtle nesting in Florida requires protecting sea turtle habitat from future construction that will destroy current nesting habitat or the areas that will be nesting habitat as the beach migrates landward. Development of a state-wide Habitat Conservation Plan (HCP) by the Florida Department of Environmental Protection (FDEP) and Florida Fish and Wildlife Conservation Commission (FWC) is a vital opportunity to protect Florida's dynamic beaches as sea turtle habitat through proper mitigation and management measures.[190] Mitigation measures that take into account climate change and SLR will be critical in ensuring preservation and conservation of sea turtle habitat. The following will address the plausibility of such provisions in a state-wide HCP.

1. Statutory/Regulatory Outline of HCPs and the ESA

Section 9 of the Endangered Species Act (ESA) prohibits *take* of an endangered species.[191] Take is defined broadly as "to harass, *harm*, pursue, hunt, shoot, wound, kill, trap, capture, or collect

[186] Case No. 05-16374, 11th Cir. Ct. Appeals (April 1, 2008).

[187] *Id.* at 13-21.

[188] *Id.* at 21-29.

[189] *Id.* at 30.

[190] See notification of grant award of $257,247 at http://www.fws.gov/Endangered/pdfs/Sec6/07Sect6AwardSummariesFINAL.pdf.

[191] 16 U.S.C. § 1538 (a)(1)(B) (it is unlawful for any person subject to the jurisdiction of the United States to "take any [endangered] species within the United State").

or to attempt to engage in any such conduct."[192] Additionally, the U.S. Fish and Wildlife Service (FWS) has promulgated regulations that interpret the word 'harm' to include modification or destruction of habitat.[193]

Section 10 of the ESA authorizes the FWS to issue *incidental take permits* (ITPs), allowing holders of an ITP to take endangered species while conducting an otherwise lawful activity.[194] Approval of an ITP requires the applicant to submit a habitat conservation plan (HCP) [195] that must specify, inter alia, the impact of the taking, means to minimize and mitigate those impacts, and alternative actions considered by the applicant.[196] In order to issue an ITP, the FWS must find that the taking will be incidental, the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the taking, and the taking will not appreciably reduce the likelihood of the survival and recovery of the species.[197] If the applicant's activities result in take that does not comply with the all terms and conditions of the ITP, the Secretary is required to revoke the permit.[198] However, it remains unclear whether the FWS has ever revoked an HCP for non-compliance.[199]

In 1998, the FWS issued the "No Surprises" rule to protect from "unforeseen circumstances" landowners who have entered into an HCP or who participate in an HCP.[200] This rule assured landowners that the FWS will not "require the commitment of additional land or financial compensation beyond the level which was otherwise adequately provided for a species under the

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[192] 16. U.S.C. §1532(19) (emphasis added).

[193] 50 C.F.R. § 17.3 ("Harm in the definition of "take" in the Act … *may include significant habitat modification or degradation* where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.") (emphasis added); *see* Sweet Home Chapter of Communities For a Greater Oregon v. Babbitt, 515 U.S. 687, 697 (1995) (upholding the regulation as reasonable).

[194] 16 U.S.C. § 1539 (a)(1)(B) (the Secretary may permit "any taking otherwise prohibited by section 1538(a)(1)(B) of this title if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.").

[195] 16 U.S.C. § 1539 (a)(2)(A) ("No permit may be issued by the Secretary authorizing any taking referred to in paragraph (1)(B) unless the applicant therefor submits to the Secretary a conservation plan.").

[196] 16 U.S.C. § 1539 (a)(2)(A)(i-iii).

[197] 16 U.S.C. § 1539(a)(2)(B).

[198] 16 U.S.C. § 1539 (a)(2)(C) ("The Secretary shall revoke a permit … if he finds that the permittee is not complying with the terms and conditions of the permit.").

[199] Ichthyology, Florida Museum of Natural History, *Logging Company Permitted to Take Endangered Trout*, (stating that an FWS biologist does not know of any HCP that has ever been revoked for non-compliance"), *available at* http://www.flmnh.ufl.edu/fish/InNews/logsalmon2003.htm (last visited Apr. 11, 2008).

[200] 63 Fed. Reg. 8859 (Feb. 23, 1998).

terms of a properly functioning HCP."[201] The No Surprises rule provides certainty to ITP holders, generally private land owners, by placing limits on the FWS's ability to require further mitigation measures after an ITP has been issued. Environmental groups have claimed that the No Surprises rule favors developers and actually contributes to species extinction, which would seem contrary to the nature of a habitat *conservation* plan.[202]

In 1999, the FWS issued a Permit Revocation Rule (PRR).[203] The FWS has codified this rule which states that the FWS shall not revoke a validly issued ITP unless it is found to be inconsistent with 16 U.S.C. § 1539 (a)(2)(B)(iv)[204] - which states "the taking *will not appreciably reduce* the likelihood of the survival and *recovery* of the species".[205]

Additionally, the FWS has issued a 5-point policy, which instructs the FWS to utilize adaptive management techniques when implementing and creating HCPs.[206] During a phone conversation with Patricia Cole, FWS National HCP Coordinator, she noted that FWS now uses adaptive management techniques when constructing and implementing HCPs, based on the 5 points-policy.[207] However, it should be noted that the 5-points policy is simply that—a policy which may be followed but that is not regulatory in nature and does not bind the agency.[208] According to the 5-points policy, adaptive management for implementation of an HCP is "a method for examining alternative strategies for meeting measurable biological goals and objectives, and then, if necessary, adjusting future conservation management actions according to what is learned."[209]

2. Plausibility of State-wide HCP

The FWS, Florida state agencies, and other interested groups are pursuing the plausibility of implementing a state-wide HCP,[210] which, in turn, could be utilized to protect sea turtle habitat.

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[201] 63 Fed. Reg. 8859 (Feb. 23, 1998).

[202] AMERICAN LANDS ALLIANCE, FACT SHEET: BRUCE BABBIT'S 5 POINT PLAN AVOIDS HCP REFORM 1 ("HCPs have been widely criticized by the conservation and scientific communities as simply allowing the timber industry and developers to continue the same practices that have led species towards extinction, and as failing to offset widespread habitat destruction and to support species recovery."), *available at* http://www.americanlands.org/documents/1091737449_bbabb5plan.pdf (last visited Apr. 11, 2008).

[203] 64 Fed. Reg. 32712 (Jun. 17, 1999).

[204] 50 C.F.R. § 17.22(b)(8) (emphasis added).

[205] U.S.C. § 1539 (a)(2)(B)(iv) (emphasis added).

[206] 65 Fed. Reg. 35242, 35252 (Jun. 1 2000) [hereinafter FWS Five Point Plan].

[207] 65 Fed. Reg. 35242, 35252 (Jun. 1 2000) [hereinafter FWS Five Point Plan].

[208] FWS Five Point Plan, 65 Fed. Reg. 35243 (Jun. 1 2000).

[209] FWS Five Point Plan (65 Fed. Reg. 35252).

[210] Telephone interview with Gene Chalecki, Florida Department of Environmental Protection, 4/1/08.

Any state-wide HCP should take into account both current and future habitat, including habitat likely to be affected by global warming and SLR.

Since a HCP is associated with an ITP, an applicant for an ITP will be required.[211] In the case of the potential Florida state-wide HCP (FL HCP), the Florida Department of Environmental Protection (FDEP) would be the applicant,[212] with Florida Fish and Wildlife Conservation Commission (FWC) as the secondary agency.[213]

Additionally, obtaining an ITP must include an otherwise legal activity by the applicant for which the ITP would be issued.[214] The otherwise legal activity should have a likelihood of resulting in take of an endangered species.[215] For the FL HCP, the FDEP Coastal Construction Control Line permitting program authorizing armoring, erection of habitable structures, and renourishment of beaches would be the otherwise legal activity for which the ITP would be issued.[216]

Any FL HCP should include forward-looking provisions, including climate change and SLR. Thus, the FL HCP should take into account areas that are not currently habitat, but that will in all

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[211] *See* Indian River County, *Habitat Conservation Plan: A Plan for the Protection of Sea Turtles on Eroding Beaches in Indian River County, Florida* (Indian River County is the applicant) (on file with CC) (hereinafter "IRC HCP"); *see also* Wisconsin Department of Natural Resources, *Habitat Conservation Plan: Karner Blue Butterfly* (Wisconsin Department of Natural Resources is the applicant),*available at* http://dnr.wi.gov/forestry/karner/hcptext/ (last visited Mar. 3 2008) (hereinafter WI HCP).

[212] *See* Draft HCP Organizational Flow Chart, *available at* ftp://rossftp.urs-tally.com/pub/hcp/ (last visited 04/04/08).

[213] *See* Draft HCP Organizational Flow Chart, *available at* ftp://rossftp.urs-tally.com/pub/hcp/ (last visited 04/04/08).

[214] *See* Indian River County HCP 1.1 (activity is emergency shoreline protection) (on file at CC) (hereinafter IRC HCP); *see also* Wisconsin HCP Chapter 1 ("state action is preparation and implementation of an HCP which will contribute to the conservation of the Karner blue butterfly and its habitat, while allowing planned management and development activities on non-federal lands to continue."), *available at* http://dnr.wi.gov/forestry/karner/hcptext/ (last visited Mar. 3 2008) (hereinafter WI HCP).

[215] Fish and Wildlife Service, *Habitat Conservation Planning Handbook* 1-4 ("The starting point for the section 10(a)(1)(B) permit process is a determination that "take" is likely to occur during a proposed non-Federal activity and a decision by the landowner or project proponent to apply for an incidental take permit."), *available at* http://www.fws.gov/endangered/hcp/hcpbook.html (last visited Mar 3 2008).

[216] Gene Chalecki, PowerPoint presentation entitled *Florida's Coastal Construction Control Line Program: A Coastal Hazard Mitigation Plan That Works* (on file with Conservation Clinic) (listing coastal armoring, post-storm emergency permitting activities, new construction, rebuilding or redevelopment, ancillary structures and excavation/fill activities associated with coastal development, public infrastructure, beach berm or dune restoration, and beach cleaning as the CCCL regulatory activities to be addressed under the FL HCP).

likelihood be endangered species habitat in the future due to SLR. Looking to the future will also include considering the impacts of existing armoring that may not be a "take" right now because turtles can still nest in front of it but that will be a "take" of habitat in the future due to erosion and SLR eliminating dry-sand beach in front of armoring.

3. The Effects of No Surprises, PRR, and the 5-point Policy on the HCP

Given the push to develop a state-wide HCP, it seems appropriate to examine the current state of HCPs and the possibility for them to be an effective conservation tool. Many environmental advocates claim that the HCP is an ineffective method for species conservation and even have detrimental impacts on species.[217] The issuance of the No Surprises rule, the Permit Revocation rule and the 5-point guidance policy has greatly shaped the possibilities available under an HCP since its inception. In order to determine the probability of a successful HCP, in terms of actually conserving and recovering a species, a deeper look at the FWS current rules and policies is necessary.

First, the PRR (permit revocation rule) standard for revocation of an ITP by the FWS is not very protective of species. While federal law states that an ITP is to be revoked if the applicant's activities result in take that does not comply with the all terms and conditions of the ITP,[218] regulations state that the FWS *shall* not revoke a permit unless it is found that takings under the ITP will "appreciably reduce the likelihood of the survival and recovery of the species."[219] Furthermore, it is unclear what appreciably reducing the likelihood of recovery of a species actually means. Environmentalists have argued that the PRR is contrary to the ESA and the HCP process because it would theoretically allow diminishment of a species until their survival or recovery has been appreciably reduced and thus is neither protecting nor conserving the species in question as required by other sections of the ESA.[220] However, the FWS argues that they have always had the ability to revoke a permit and this rule simply gives them further guidance in determining permit revocations.[221] One could argue that significant habitat modification or loss, loss of mating pairs or nesting habitat, would qualify as appreciably reducing the likelihood of the recovery of the species. However, it appears that the FWS has never revoked an HCP for non-compliance.[222]

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[217] *See* Seattle Post-Intelligencer, Special Report: *A License to Kill*, ("Many of the nation's [habitat]conservation plans have serious shortcomings that tip the scales in favor of development over endangered species"), *available at* http://seattlepi.nwsource.com/specials/licensetokill/ (last visited Apr. 11, 2008).

[218] 16 U.S.C. § 1539 (a)(2)(C) ("The Secretary shall revoke a permit … if he finds that the permittee is not complying with the terms and conditions of the permit.").

[219] 50 C.F.R. §1722(b)(8).

[220] 69 Fed. Reg. 71726 (Dec. 10, 2004).

[221] 69 Fed. Reg. 71727 (Dec. 10, 2004).

[222] Ichthyology, Florida Museum of Natural History, *Logging Company Permitted to Take Endangered Trout*, (stating that an FWS biologist does not know of any HCP that has ever been revoked

Second, the language of the No Surprises rule and the 5-point policy seem utterly inconsistent. Any adaptive management techniques advocated by the 5-point policy would need to incorporate substantial change in an HCP in order to be effective. However, changes to an existing HCP could contravene the No Surprises Rule. For these reasons, as well as those discussed below, many environmental activists have criticized the HCP process for not doing enough to ensure or promote the conservation of endangered species habitat.[223] However, the FWS has noted that while the FWS can't make modifications that would require additional cost to the applicant (land or money), the rule allows for latitude to the plans to respond to unforeseen circumstances that require no additional cost.[224]

In late 2003, after years of litigation concerning the No Surprises Rule and PRR, environmental groups and a Native American tribe again challenged the rules in the United States District Court, District of Columbia.[225] Among the arguments brought by the plaintiffs were that the No Surprises rule was issued in violation of the ESA because it precluded the FWS from making changes in an HCP necessary to ensure survival or recovery of the endangered species and that the FWS's decision to issue the rule was arbitrary and capricious, in violation of the APA, for failure to consider public comment, offer a rationale for the rule that was consistent with the ESA, and to address reasonable alternatives.[226] The plaintiffs argued the PRR was issued in violation of the ESA and the APA for FWS's failure to consider public comment in promulgating the rule and for failure to adequately explain the terms for which a permit would actually be revoked.[227] The court vacated the case on grounds that the FWS did not follow proper public comment procedures, as required by the APA, with regard to the PRR but did not rule on the merits of either the PPR or the No Surprises rule.[228] The court remanded and required the FWS to undergo proper rulemaking procedures for the PPR and required the FWS to consider No Surprises and PRR rules and regulations together.[229] In response to the court order,

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for non-compliance"), *available at* http://www.flmnh.ufl.edu/fish/InNews/logsalmon2003.htm (last visited Apr. 11, 2008).

[223]

[224] 69 Fed. Reg. 71727 (Dec. 10, 2004).

[225] Spirit of Sage Council v. Norton, 294 F.Supp.2d 67, 71 (D.D.C. 2003).

[226] *Id.*

[227] *Id.*

[228] *Id.* at 85 (finding "that the PRR was promulgated in violation of the APA's notice and comment requirements, the Court will vacate and remand the PRR for further consideration by the Services. Moreover, because the government explicitly relies on the PRR to bolster its contention that the No Surprises Rule is consistent with the requirements of the ESA, the Court will not reach the merits of plaintiffs' substantive challenges to the No Surprises Rule, and instead remands the No Surprises Rule for consideration as a whole with the PRR.")

[229] *Id.* at 92.

the FWS re-issued the PRR in essentially the same form after undergoing proper public comment rulemaking procedures. [230]

In 2007 Native American and environmental groups again challenged the No Surprises Rule and the PRR in the United States District Court for the District Court of Columbia.[231] The groups' primary argument was that the PRR contravenes the recovery and conservation language of section 10 and other portions of the ESA and is therefore not "in accordance with the law" under the APA.[232] The court rejected the challenges to both.[233] The court noted that in determining whether a rule was in accordance with the law they were required to implement the *Chevron* deference standard, a two-step standard.[234] Under step one of the *Chevron* analysis, the court will first consider whether the statute specifically addresses the issue before the court.[235] If it does the analysis will stop there; if it does not, the court will conduct the second test in the *Chevron* analysis, which results in deferring to the agency's interpretation of the statute if it is reasonable.[236] The Plaintiff's argued that the PRR was contrary to section 10 of the ESA and should be overturned under *Chevron* step one because the PRR so limited the ability of the FWS to revoke an ITP (to times when the likelihood of the survival and *recovery* of the species are appreciably reduced) that an HCP would no longer be able to ensure conservation of the species as based on the statutory definition of "conservation."[237] However, while the court admits that the PRR "significantly narrows the circumstances under which the [FWS] may revoke a permit,"[238] the court points out that the specific language of section 10 speaks to minimizing impacts to the species but does not address recovery[239] and that applicants are only required not to *appreciably* reduce "the likelihood of the survival or recovery of the species."[240] Thus, the

[230] 69 Fed. Reg 71723 (Dec. 10, 2004).

[231] Spirit of the Sage Council v. Kempthorne, 511 F.Supp.2d 31, 34 (D.D.C. 2007).

[232] *Id.* at 41.

[233] *Id.* at 46.

[234] *Id.* at 41.

[235] *Id.* at 41.

[236] Id. at 41.

[237] *Id.* at 42; *see also* 16 U.S.C. § 1532(3) ("The terms "conserve", "conserving", and "conservation" mean to use and the use of all methods and procedures which are necessary to bring any endangered species … to the point at which the measures provided pursuant to this chapter are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.").

[238] *Id.* at 41.

[239] *Id.* at 42.

[240] Id. att 42.

court ruled that the PRR did not fail under *Chevron* step one[241] and was a reasonable interpretation under *Chevron* step two.[242] The court also rejected the argument that the No Surprises rule violates the ESA on the grounds that the ESA does not require ITPs "to promote or maintain the recovery of the species."[243] The court went on to reject all of the Plaintiff's arguments that the rationale given for the rules by the FWS were arbitrary and capricious under the APA.[244] The court noted that FWS would have to abide by Section 7 and therefore, "before issuing an ITP, the [FWS] must find that doing so 'is not likely to jeopardize the continued existence of any [listed] species or result in the destruction or adverse modification of habitat of such species.'"[245]

Thus, at least one court and numerous commentators have found an HCP is a plan to mitigate harm to a species for development or other land use activities[246] rather than a proactive means to conserve or protect habitat or the species itself.[247] As the FL HCP process goes forward, these concerns should be duly noted.

This still leaves the question as to whether a state-wide HCP is an effective means to protect sea turtle habitat. The following analysis will discuss the potential of a state-wide HCP in Florida to protect dwindling sea turtle habitat. The long-term prognosis may be largely dependent on the willingness of the applicant and other ITP participants to acknowledge and implement mitigation measures that will address climate change and SLR.

4. Problems Involving Sea-Level Rise and Sea Turtle Habitat

The Florida Coastal Construction Control Line (CCCL) permit program is the primary activity that would be covered by the FL HCP.[248] The CCCL is not a setback line but is a line of

[241] Id. at 43.

[242] Id. at 44.

[243] Id. at 44 (emphasis added).

[244] Id. at 46.

[245] Id. at 46 (citing Section 7 of the ESA).

[246] Fish and Wildlife Service, *Habitat Conservation Planning Handbook* 1-4 ("the HCP process is designed to address non-Federal land or water use or development activities that do not involve a Federal action"), *available at* http://www.fws.gov/endangered/hcp/hcpbook.html (last visited Feb 19, 2008).

[247] However, *see* 5 Points Plan ("Under section 10 of the ESA, we do not explicitly require an HCP to recover the listed species or contribute to the recovery objectives outlined in a recovery plan, but do not intend to permit activities that preclude recovery. This reflects the intent of the … incidental take permit process to provide for authorization of incidental take, not to mandate recovery. However, the extent to which an HCP may contribute to recovery is an important consideration in any HCP effort, and applicants should be encouraged to develop HCPs that produce a net positive effect on the species.") (65 Fed. Reg. 35242) (date?).

[248] Telephone interview with Kat Diersen and Tom Ostertag, Florida Fish and Wildlife Conservation Commission, (FWC).

permitting jurisdiction. This program is explored in detail below,[249] but suffice it here to note that the CCCL does not address SLR.

Under current CCCL permitting program regulations, a structure built after 1985 with a CCCL permit will **not** be eligible to construct armoring.[250] However, structures built anytime after 1984 and located landward of the CCCL at the time they are built would be eligible for future armoring permits if the beach migrates far enough to threaten such structures. This scenario could present the specter of extensive armoring as sea level rises, especially considering that many CCCLs in the state are already more than twenty years old and now much closer to the shore than when they were established. As Florida's beaches continue to erode, sea-levels continue to rise, and beach front structures continue to be built, the likelihood that many of the structures that are currently built landward of the CCCL will come into the proximity of the ocean becomes more and more likely. Thus, the CCCL permitting should address the realities that the current limitations for armoring may not be effective to protect sea turtle habitat as SLR manifests itself through shorelines that migrate landward.

5. What Needs to be Considered During HCP Process

To effectively protect sea turtle nesting habitat, mitigation measures addressing SLR must be included in any Florida statewide HCP. While an HCP's take provisions will only address the activity permitted under the HCP (here, the permitting activities seaward of the CCCL), the mitigation measures for the HCP can address activities or measures outside the permitted activity area.[251]

According to Patricia Cole, the FWS National HCP Coordinator, the FWS has not yet incorporated global warming or global climate change into an HCP. According to Ms. Cole, the FWS is currently working on the best ways to implement such provisions in coordination with the USGS given the scientific uncertainty of the impacts for different regions of the country.[252] However, Ms. Cole noted that the FWS is now required to include adaptive management techniques when constructing and implementing an HCP.[253] Adaptive management, according to FWS, for implementation of an HCP means "a method for examining alternative strategies for meeting measurable biological goals and objectives, and then, if necessary, adjusting future

[249] The CCCL program is examined in detail below in Part III.D.

[250] Major habitable structures are only eligible for armoring if they are "non-conforming." FLA. ADMIN. CODE r. 62B-33.0051(1)(a)1. A non-conforming structure is "any major habitable structure which was not constructed pursuant to a permit issued by the Department [of Environmental Protection] pursuant to Section 161.052 or 161.053, F.S., on or after March 17, 1985." FLA. ADMIN. CODE r. 62B-33.002(43).

[251] Telephone interview with Kat Diersen and Tom Ostertag, Florida Fish and Wildlife Conservation Commission.

[252] Telephone call with Patricia Cole, FWS National HCP Coordinator, March 12, 2008.

[253] 65 Fed. Reg. 35242, 35252 (Jun. 1 2000) [hereinafter FWS Five Point Plan].

conservation management actions according to what is learned."[254] Furthermore, the FWS states that "significant data gaps that may require an adaptive management strategy include … lack of specific information about the ecology of the species or its habitat … or lack of knowledge on the degree of potential effects of the activity on the species." Given this language and the information provided by the National HCP Coordinator, it seems that climate change could be incorporated into a future HCP using adaptive management monitoring and implementation.

6. Important Provisions to Include in HCP

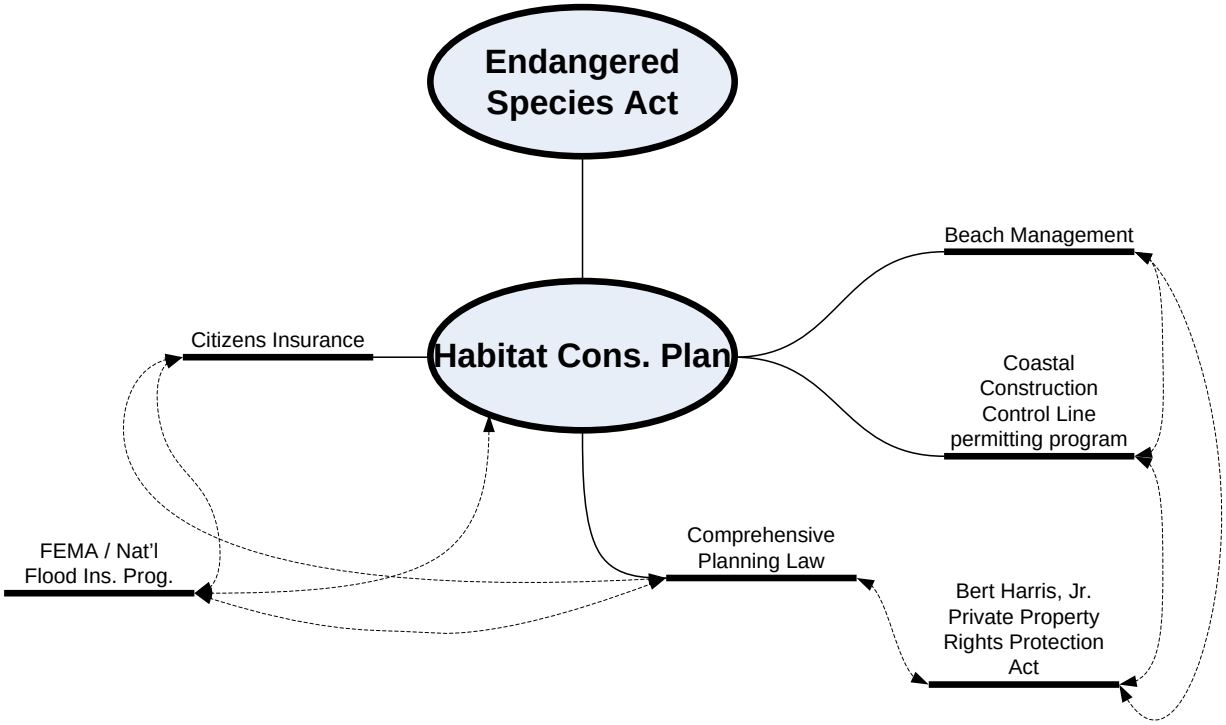
The low likelihood that an HCP will ever be revoked makes it critical that the HCP is carefully crafted from the outset to protect relevant species and their habitats. An HCP must include an analysis of the anticipated take likely to be associated with the activities to be conducted pursuant to the HCP. This includes a "complete description of the activity sought to be authorized" and specifying the "impact that will likely result from such taking." According to the FWS, the take analysis can be either quantified by the number of individual species affected by an activity or the amount of habitat that will be lost.

Take analysis for a useful HCP should include an analysis of global warming and the resulting SLR when calculating the amount of habitat that will be lost. If this is not done, armoring or major habitable structures (which, under current law, could be armored in the future) could be permitted even if we know that in the future they will be at the water's edge, resulting in damage or destruction of sea turtle nesting habitat.

7. HCP as a Unifying Concept for Multiple Reforms to Beach Management Policy

A properly constructed HCP could serve as the unifying theme leading to the broad-based, integrated thinking about Florida's coastal management leading to legal and policy reform in the CCCL permitting program, beach management, comprehensive planning requirements, insurance policy, and statutory takings law. Reasons for the need to change policy in these areas as well as possibilities for change follow in the remainder of this report.

[254] FWS Five Point Plan (65 Fed. Reg. 35252).



Adoption of a poorly-crafted HCP that does not sufficiently account for SLR, does not significantly reform the CCCL permitting program, and does not address development patterns through comprehensive planning could potentially be worse than the status quo since it could entrench poor policy for the next twenty to thirty years. Failure to establish an HCP might be better than adoption of a poor HCP.

III. Florida Coastal Management Policy

A. *Perverse Incentives Redux: Citizens Property Insurance and Florida's "Cat" Fund*

The National Flood Insurance Program is not the only publicly-funded policy that promotes development in high-risk areas. Coastal property owners and developers in Florida benefit from Citizens Property Insurance Corporation (Citizens), a state-run insurance company created by the legislature in 2002[255] and from the Hurricane Catastrophe Fund, a reinsurance company also created by the state legislature.[256] These two companies represent the state-level version of the federal government subsidies that artificially lower the cost and risk associated

[255] FLA. STAT. § 627.351(6) (2007).

[256] The Florida Legislature relies on "a panel of experts to provide the most actuarially sophisticated guidelines and standards for projection of hurricane losses possible, given the current state of actuarial science." FLA. STAT. § 627.0628(1)(c) (2007).

with coastal residences and businesses. Citizens is currently the largest property insurer in Florida and has over 1.3 million policies in force and an exposure to loss in the hundreds of billions of dollars.[257]

The Florida Legislature explicitly recognizes that "private insurers are *unwilling* or *unable* to provide affordable property insurance," and that the lack of insurance poses a threat to public health, safety, and welfare and the state economy.[258] State-provided affordable insurance results from charging less than what private insurers charge,[259] even though private rates are presumably established at levels that reflect both the risk of loss exposure by the insurance companies and a profit margin for these private companies.

Citizens functions as a non-profit organization that provides insurance for those whom the private market will not insure or for those whose rates in the private market would be 25% more than Citizens' rates.[260] It is exempt from paying federal income taxes on its revenue and any bonds that it issues.[261] Unlike private insurance companies, Citizens is not required to maintain a minimum amount of capital or any policyholder surplus, so its current premiums fund current losses.[262] In case of deficits, Citizens may receive bailouts from state revenue dollars. In 2005, Citizens incurred a $1.77 billion deficit as a result of the hurricane season, and state legislators provided a $715 million appropriation off-set.[263]

During a special legislative session in January 2007, the Legislature significantly expanded the functions of Citizens.[264] By deleting the requirement that Citizens charge non-competitive rates

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[257] Citizensfla.org, *Policies in Force*, *available at* http://www.citizensfla.org/ (last visited Oct. 25, 2007).

[258] *Id.* (emphasis added).

[259] This policy also seems to contradict another Legislature goal of encouraging "reasonable price competition among insurers." FLA. STAT. § 627.031(1)(b) (2007).

[260] Special Legislative Session, January 2007 – Senate Committee on Banking and Insurance, 2007-A Special Session *Summary of Legislation Passed* 5 (2007), available at www.fl**senate**.gov/Publications/**2007**A/**Senate**/reports/summaries/pdf/sessum07A.pdf [hereinafter Special Legislative Session].

[261] *Id.* For example, in July 2007, Citizens executed a $950 million bond deal with an additional $1 billion bank line credit, for a total of $1.95 billion in additional financing – and Citizens is not required to pay taxes for that amount. Insurance Information Institute, *Florida Citizens Property Insurance Corporation (CPIC): What it is and How It Works* (Aug. 2007), available at XXX.

[262] Christine L. Agnew, *Come Hell and High Water: Can the Tax Code Solve the Post-Katrina Insurance Crisis?*, 11 LEWIS & CLARK L. REV. 701, 726-31 (2007).

[263] Robert P. Hartwig & Claire Wilkinson, Insurance Information Institute, *Residual Market Property Plans: From Markets of Last Resort to Markets of First Choice* 15 (June 2007).

[264] Special Legislative Session, January 2007 – Senate Committee on Banking and Insurance, 2007-A Special Session *Summary of Legislation Passed* 5 (2007), available at www.fl**senate**.gov/Publications/**2007**A/**Senate**/reports/summaries/pdf/sessum07A.pdf [hereinafter Special Legislative Session].

higher than other insurance companies, the Legislature made Citizens more widely available.[265] Moreover, the Legislature rescinded a 2007 rate increase and froze insurance rates at 2006 levels.[266] Existing policyholders are also permitted to reject a coverage offer from private insurers, and new applicants are only ineligible for coverage by Citizens if the private insurance rate is more than 25% higher than Citizens' rate.[267] As a result of these changes, "Citizens will be placed in a more competitive role with the private market, making it likely to increase its policy growth at an even greater pace, at least for the near future."[268] The growing popularity of Citizens as a first choice for coastal property insurance comes with a corresponding growth in exposure and potential loss. The 2007 special session also allows Citizens to fund deficits by imposing assessments on other insurance policies sold in Florida.[269] Thus, property insurance of those outside of high-risk areas as well as all auto insurance policies in Florida now help fund the subsidized insurance for those living in Florida's high-risk coastal areas.

The Florida Hurricane Catastrophe Fund (Cat Fund) is the state-created, non-profit reinsurance company that reinsures both private insurers and Citizens. The Cat Fund generates funds from the premiums charged to and emergency assessments on Florida's property and casualty insurers.[270] Reinsurance through the Cat Fund is required for private insurance companies that write policies in Florida, and only losses from hurricanes are eligible for coverage by the Cat Fund.[271] The special legislative session in 2007 that expanded Citizens' coverage similarly impacted the Cat Fund by lowering the cost of reinsurance.[272]

Through Citizens and the Cat Fund, Florida has extended insurance for high-risk coastal development at the expense of both the taxpayers and the public interest. While both non-profit insurers can sell bonds to raise funds, critics are skeptical about the ability to find buyers in such a high-risk business.[273] Critics point out that private insurers have purchased additional reinsurance from private reinsurers, demonstrating a lack of confidence in the ability of the Cat

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[265] *Id.*

[266] *Id.*

[267] *Id.*

[268] *Id.*

[269] *Id.*

[270] Christine L. Agnew, *Come Hell and High Water: Can the Tax Code Solve the Post-Katrina Insurance Crisis?*, 11 LEWIS & CLARK L. REV. 701, 729 (2007).

[271] STATE BOARD OF ADMINISTRATION OF FLORIDA, FLORIDA HURRICANE CATASTROPHE FUND 2006/2007 MEMBER HANDBOOK (June 2006), available at www.paragonbenfield.com/fhcf/pdf/06handbook.pdf.

[272] For example, 2007 legislation repealed a 2006 increase in premiums that was intended to build up cash reserves for the Cat Fund; this resulted in about a 3% average reduction in cost for residential policyholders. Special Session, *supra* note 260.

[273] Eli Lehrer, *Bankrupting Florida*, 12 THE WEEKLY STANDARD (Aug. 20, 2007).

Fund to sell bonds after a major storm event.[274] Although the precarious state-created insurance system could theoretically survive a series of moderate storms, analysts are uncertain about the system's ability to survive a Hurricane Katrina-like catastrophe, which would render the entire state treasury vulnerable.[275]

The financial risk that the State of Florida has taken on through Citizens and the Cat Fund staggers the imagination. In 2007, it was estimated that a 1-in-50-year storm could have resulted in average additional property insurance assessments per household of $188 dollars—for the next thirty years for that one event.[276] A 1-in-250-year storm could have resulted in assessments of up to $449 per household for the next thirty years for one event.[277]

Efforts to craft more sound federal and state coastal policy should include a return to free-market principles in coastal development economies, leading to a more economically efficient and environmentally sound coastal policy. Coastal property owners should gradually be weaned from government insurance subsidies, shifting insurance costs and profits to private companies that would provide multi-peril insurance at actuarially sound rates.[278] The government should assist in this transition by conditioning the availability of post-disaster relief on having hurricane insurance and by undertaking comprehensive studies to map hurricane, flood, and SLR risks. Furthermore, to entice private insurance companies to provide hurricane insurance, the government should restructure tax policies to allow private insurance companies to maintain their own catastrophe reinsurance, rather than having the government act as a reinsurer.[279]

B. *The Statutory Basis for Beach Management*

Florida's beaches naturally move. As noted, beach migration becomes erosion when it threatens human interests. Three causes of beach migration have been identified: 1) inlets, 2) wave action/storms, and 3) SLR. Florida has focused on inlets and waves/storm action as the causes of erosion[280] but has not yet begun to address sea-level rise. Inlets contribute substantially to erosion on beaches on the downdrift side of the dominant long-shore currents.

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[274] *Id.*

[275] *Id.*

[276] Towers Perrin, Study of Recent Legislative Changes to Florida Property Insurance Mechanisms (PowerPoint presentation) (March 19, 2007), available at http://www.towersperrin.com/tp/getwebcachedoc?webc=TILL/USA/2007/200704/AIF_FL_Study_FINAL.pdf.

[277] *Id.*

[278] PIDOT, *supra* note 95.

[279] *Id.*

[280] *See, e.g.* Florida Dept. of Envt'l Prot. Inlet Management Plans, available at http://www.dep.state.fl.us/beaches/publications/gen-pub.htm#Strategic_Management_Plan; Shoreline Change Rate Estimate Reports, available at http://www.dep.state.fl.us/beaches/publications/tech-rpt.htm#Critical_Erosion_Reports.

The available responses to beach migration usually are considered to include no action, protection (through armoring and nourishment), and relocation away from the shoreline. The no-action alternative has very seldom been used in Florida as it results in human development falling into the sea—a lose/lose situation both for the property owner and the beach-dune system that is then littered with the remains. Protection through armoring has been successful in protecting human structures in many instances, but continued shoreline migration up to the armoring leads to loss of the beach, its ecosystem functions, and human benefits such as tourism. Loss of the beach due to armoring also seems unfair to the residents of Florida that depend on the state to protect the public's interest in the beach via the public trust doctrine. Furthermore, loss of beaches would have severe economic consequences for Florida because of reduced tourism.[281] Relocation of development away from the shoreline would avoid loss of the beach and protect species and ecosystems dependent on the beach, but this strategy has rarely been used in Florida.[282] Property owners often feel that any failure of state or local government to provide them with some sort of protection from migrating shores is unfair. Thus, beach nourishment has emerged as Florida's default policy for beach management because it offers protection to property, wildlife habitat, and the recreational value of beaches.

Florida statutes declare that it is "a necessary governmental responsibility to properly manage and protect Florida beaches fronting on the Atlantic Ocean, Gulf of Mexico, and Straits of Florida from erosion," including erosion caused by improvement, modification, or alteration of inlets.[283] Important provisions

[281] *See*, *supra* note 9 and Economics of Florida's Beaches: The Impact of Beach Restoration (2003), *available at* www.dep.state.fl.us/beaches/publications/pdf/phase1.pdf..

[282] Florida permitting officials have issued permits for landward relocation of several residences on Dog Island, located off the panhandle coast of Florida in Franklin County.

[283] FLA. STAT. § 161.088 (2007). Statutes sections 161.088 to 161.211 govern beach nourishment and preservation activities. DEP must also develop a multiyear repair and maintenance strategy which encourages regional approaches to ensure the geographic coordination and sequencing of prioritized projects, reduces equipment mobilization and demobilization costs; maximizes the infusion of beach-quality sand into the system; extends the life of beach nourishment projects and reduces the frequency of nourishment; and promotes inlet sand bypassing to replicate the natural flow of sand interrupted by improved, modified, or altered inlets and ports. *Id.* § 161.091(2)(a)-(e).

include those related to funding,[284] criteria for state funding,[285] establishment of an erosion control line when nourishment occurs,[286] policy related to navigation inlets,[287] and management of sand sources.[288]

Florida's Department of Environmental Protection (DEP) acts as Florida's beach and shore preservation authority[289] through the Beach Erosion Control Program.[290] The program has developed a long-range management plan for Florida's beaches.[291] The plan's principles include: maximizing use of beach-quality sand in the coastal system, using methods that best address erosion problems, promoting inlet sand bypassing, extending the life of beach restoration projects, reducing the frequency of nourishment, encouraging regional approaches, and reducing equipment mobilization and de-mobilization costs.[292]

The plan implements active management strategies such as includes beach and dune restoration and nourishment, feeder beaches, inlet sand by passing, and other actions to mitigate effects of erosion. Currently about half of Florida's 391.5 miles of critically eroded beaches are under active management .[293] An increasingly significant portion of the strategic beach management plan focuses on the sand supply for beach nourishment.[294]
The plan also includes monitoring programs to evaluate management projects.[295] Physical monitoring includes topographical surveys and provides information used to assess and manage beach erosion control

[284] *See generally id.* at § 161.101.

[285] *Id.* at §§ 161.101(12) and 161.101(14). Section 161.101(12) requires that projects receiving state funds "provide adequate public access, protect natural resources, and provide protection for endangered and threatened species." Additionally, §161.101(14) sets forth several criteria which must be considered by DEP in determining annual funding priorities, which include, "the severity of erosion conditions, the threat to existing upland development, and recreational and/or economic benefits;" "the anticipated physical performance of the proposed project" (including frequency of periodic planned nourishment); "the extent to which the proposed project mitigates the adverse impact of improved, modified, or altered inlets on adjacent beaches;" and "projects that provide enhanced habitat within or adjacent to designated refuges of nesting sea turtles."

[286] *Id.* at § 161.141.

[287] *Id.* at § 161.142.

[288] *Id.* at § 161.144.

[289] *Id.* at § 161.101(2).

[290] For information on Florida's Beach Erosion Control Program, see www.dep.state.fl.us/beaches/programs/bcherosn.htm .

[291] The long-range management plan is in various documents divided up by regions of the state. They are available at http://www.dep.state.fl.us/beaches/publications/gen-pub.htm .

[292] BUREAU OF BEACHES AND COASTAL SYSTEMS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, STRATEGIC BEACH MANAGEMENT PLAN 1 (May 2008), *available at* http://www.dep.state.fl.us/beaches/publications/pdf/SBMP/Cover%20and%20Introduction.pdf.

[293] *Id.* at 2.

[294] *Id.* at 8.

[295] *Id.* at 8-9.

projects. Environmental monitoring assesses the effects of beach erosion control projects and the success of mitigation projects.[296]

While not the focus of this article, it is necessary to consider the rise of beach nourishment as the default policy response to beach migration since nourishment appears to contribute to further development in areas currently subject to beach migration and areas where beach migration is occurring and will occur with SLR. Even as nourishment enables at-risk development, nourishment itself faces increasing challenges.

C. *Nourishment: Dredging Up New Problems?*

With a total of 140 beach nourishment projects, Florida has conducted the largest number of beach nourishment projects of all Gulf and Atlantic states in the United States.[297] The majority of critically-eroding areas of beach in Florida have now been incorporated into the "State Beach Nourishment Program."[298] This section discusses the legal context for beach nourishment before examining problems with beach nourishment.

1. Laws and Regulations Governing Beach Nourishment

Beach nourishment projects, whether federal, state, local, private, or a mixture of all, must obtain permits for the activity. Florida Statute §161.041 establishes that the first step in all nourishment projects is to obtain a permit from the Department of Environmental Protection.[299] Florida Statute section 161.041 further grants the DEP the power to set the terms and conditions for the application of such permits.[300] The statute grants the DEP substantial discretion in deciding whether to grant a nourishment permit and what to consider when making such a decision.[301]

Florida Statute section 161.101 outlines how nourishment projects may be funded. From the outset, section 161.101 states that the Florida legislature recognizes that beach erosion is a statewide problem and that the chosen methods of addressing this problem are beach restoration and beach nourishment.[302] The statute goes on to state that the Department of Environmental

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[296] *Id.*

[297] NOAA Coastal Services Center, http://www.csc.noaa.gov/beachnourishment/html/human/socio/geodist.htm (last visited October 2, 2007) [hereinafter *NOAA Home*].

[298] Draft SBMP Introduction, p.6. As recently as 2000 only about 42% of critically-eroding beaches in Florida were actively managed. State of Florida Strategic Beach Management Plan (Oct. 2000), available at http://www.dep.state.fl.us/beaches/publications/pdf/int-sbmp.pdf.

[299] FLA. STAT. §161.041(1) (2007).

[300] *Id.*

[301] *See generally* FLA. STAT. §161.041 (2007).

[302] FLA. STAT §161.101(1) (2007).

Protection will determine which beaches need nourishment and may authorize funds for such projects if they meet the requirements of the relevant Florida statutes.[303]

Florida Statute section 161.161 is one such relevant statute which sets out the procedure for approval of nourishment projects. Section 161.161 states that the DEP shall develop and maintain a beach management plan and that nourishment projects must be completed in accordance with this plan.[304] This plan must address long-term solutions to erosion, evaluate the impacts of inlets, and design criteria for beach nourishment projects.[305] Thus, through these three statutes, the Florida legislature has empowered the DEP to create the criteria used to determine which nourishment projects will be executed.

The DEP has expressed its nourishment permitting criteria in Chapter 62B of the Florida Administrative Code. Section 62B-41.005 states that it is the DEP's policy to prevent further degradation of coastal systems and thus that coastal construction authorized by the DEP shall be limited.[306] As such, all applicants must identify the potential benefits and impacts to the coastal system created by their nourishment project.[307] In determining whether to authorize a nourishment project, the DEP will consider engineering data concerning the existing coastal system, the design features of the nourishment project, and other relevant facts and circumstances.[308] Chapter 62B further states that the DEP should not allow any "[p]roposed coastal construction which is reasonably expected to have a significant adverse impact . . . ."[309] However, such projects may be permitted as long as monitoring programs are implemented.[310]

Before the DEP may approve any permit, several requirements must be met by the applicant. These requirements include the minimization of any expected adverse impacts and assurance that the construction is designed in accordance with established engineering and scientific practice. For example, for nourishment projects, "[t]o protect the environmental functions of Florida's

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[303] *See generally* FLA. STAT. §161.101 (2007). Florida Statute section 161.101(12) requires that projects receiving state funds "provide adequate public access, protect natural resources, and provide protection for endangered and threatened species." Additionally, §161.101(14) sets forth several criteria which must be considered by DEP in determining annual funding priorities, which include, "the severity of erosion conditions, the threat to existing upland development, and recreational and/or economic benefits;" "the anticipated physical performance of the proposed project" (including frequency of periodic planned nourishment); "the extent to which the proposed project mitigates the adverse impact of improved, modified, or altered inlets on adjacent beaches;" and "projects that provide enhanced habitat within or adjacent to designated refuges of nesting sea turtles."

[304] *Id. at* §161.161(1).

[305] *Id. at* §161.161(1)(a)(b)(c).

[306] FLA. ADMIN. CODE r. §62B-41.005(1).

[307] *Id.* at (2).

[308] *Id.* at (3).

[309] *Id.* at (5).

[310] *Id.* at (16).

beaches, only beach compatible fill shall be placed on the beach . . . ."[311] However, the DEP reserves the right to approve deviations from these requirements "if those deviations would not increase the potential for adverse impacts to the coastal system or marine turtles."[312]

Chapter 62 goes on to state the procedural requirements of obtaining a permit in 62B-41.008. Moreover, 62B-41.008 contains several additional requirements for nourishment permits. Permit applications for nourishment projects must include an analysis of the native sediment and the sediment at the proposed borrow sites.[313] This analysis must demonstrate the nature of the material, quantities available, and its compatibility with the naturally occurring beach sediment.[314] The application must also include a quality control/assurance plan that ensures that the sediment from the borrow sites to be used in the project will meet the requisite standards.[315] If all of these requirements are met, then the DEP has the discretion to grant a permit for a nourishment project.

Increasingly, though, questions arise about the long-term feasibility and desirability of beach nourishment as the exclusive means of maintaining Florida's beaches. Potential long-term feasibility issues include cost, habitat impacts, sand supply, energy requirements, and private property rights.

2. Cost

Beach nourishment does not come cheap.[316] Federal, state, and local governments contribute to nourishment as well as private parties in some cases. While it is not clear how much the federal government has spent overall on nourishment in Florida, from 1992 to about 2002, the federal government was the single largest contributor of funds for nourishment in Florida, providing $122 million.[317] "Through the fiscal year 2006, over $582 million has been appropriated by the [Florida] Legislature for beach erosion control activities and hurricane recovery."[318] Local governments also spend considerable funds for beach nourishment,[319] and even private parties also spend substantial funds trying to keep sand on the beach.[320]

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[311] FLA. ADMIN. CODE r. § 62B-41.007(2)(j).

[312] FLA. ADMIN. CODE r. § 62B-41.007(3).

[313] FLA. ADMIN. CODE r. § 62B-41.008(k)(4).

[314] *Id.*

[315] *Id.*

[316] A compilation of beach nourishment projects for Florida developed by the Program for the Study of Developed Shorelines estimates the cost of beach nourishment in Florida from 1944 to the present to exceed $1 trillion. Information available at http://psds.wcu.edu/1038.asp.

[317] CATANESE CENTER FOR URBAN AND ENVIRONMENTAL SOLUTIONS AT FLORIDA ATLANTIC UNIVERSITY, ECONOMICS OF FLORIDA'S BEACHES: THE IMPACT OF BEACH RESTORATION 25 (2003).

[318] www.dep.state.fl.us/beaches/programs/bcherosn.htm.

[319] For example, Cape San Blas in Gulf County is slated for nourishment; Gulf County will pay $10.1 million and the State of Florida will pay the remaining $10.7 million of the $20.8 price tag.

Florida's Long Range Budget Plan reflects the projected budget needs for the next 10 years based on the work outlined in the Strategic Plan. The budget plan is divided into the same regions and subregions as the Strategic Plan.[321] Expenditures for feasibility, design, construction, and monitoring of projects for the 2008/2009 fiscal year alone are estimated to exceed $198,560,000.[322] The potential long-term costs stagger the imagination. One person, extrapolating from data current in 2001 in Florida, estimated costs reaching as high as $90 - $230 billion over the next 40 years for Florida alone for beach nourishment depending on assumptions about future sand costs, SLR, and amount of eroding beaches nourished.[323] A long-term expert in the field of nourishment estimated a more modest cost of about $1.5 billion for a decade of beach nourishment *based on the past ten years*.[324]

Couple these costs with the downturn in Florida's economy due to our reliance on document stamp revenues generated by the housing market (which some do not expect to rebound until 2011), and nourishment looks more and more like economic folly.

3. Habitat Impacts

One significant driver of beach nourishment has been the effort to protect sea turtle nesting habitat from destruction by sea walls or other armoring structures. Sea turtle advocates view nourishment far more favorably than sea walls since a nourished beach can still provide turtle-nesting habitat. Nonetheless, nourishment often leads to negative impacts on sea turtle and other species.

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http://www.savethecape.com/funding.cfm. This cost is in addition to a grant of $562,000 from the Florida Department of Environmental Protection to Gulf County to conduct a Beach Management Feasibility Study. Lee County estimated total beach nourishment costs for a ten-year period to be $73,996,437, of which the state would directly pay $ 26,249,414, the federal government would pay 12,056,466, a local bed tax would pay 18,056,625, and property owners would pay 17,633,931. www.leevcb.com/shore/Erosion_Control_Budget_Plan_updated_August05.pdf.

[320] For example, the owner of a small hotel in Brevard County said that she spent $40,000 on trucking in sand after the 2004 and 2005 hurricanes but that the sand rapidly disappeared. Jim Waymer, Florida Today, section: news, page A1 (Oct. 6, 2007). Similarly, a property owner in St. Johns County is reported to have spent $47,000 on sand that washed away within two weeks. Christina Abel, Times-Union (electronic addition), Seawall waivers granted to 5 beach homeowners (April 12, 2008) available at http://www.jacksonville.com/tu-online/stories/041208/met_267694953.shtml.

[321] 2008 Long Range Budget Plan, p.1

[322] 2008 Long Range Budget Plan, p.4

[323] Mark Shantzis, letter and attachments addressed to Florida Governor Jeb Bush and others (Nov. 26, 2001). These documents are included in Appendix C: Future Nourishment Costs in Florida.

[324] *See*, Presentation of Pilkey, page 14, available at http://el.erdc.usace.army.mil/workshops/05feb-dots/session4-pilkey.pdf.

Almost twenty years ago turtle researchers were recommending nourishment as a way to protect sea turtle habitat in the face of shoreline erosion.[325] Beach nourishment, however, may alter many aspects of the beach that affect sea turtle nesting behavior and success. Factors include slope, density, moisture content, color, grain size, shear resistance, and mineral content.[326] For example, a turtle's access to its nesting site is affected by steep escarpments, which form in the mid-beach zone as a result of altered wave action caused by nourishment projects.[327] When a female turtle's access to its nesting site is obstructed by these escarpments, she won't lay eggs, thus resulting in a false crawl. In addition, the actual transporting of sand onto the beach itself often results in severe compaction of the sand which significantly reduces the nesting success.[328] The nourishment process may also expose buried sediments unsuitable for nesting.[329] Studies indicate that successful nesting dramatically decreases the first year after a nourishment project, but that this negative effect begins to decrease by the second year.[330] Such a result remains preferable, however, to a loss of habitat due to erosion if the beach is not allowed to migrate.[331]

Environmental impacts extend far beyond turtle nesting. Some argue that "beach nourishment" is simply a euphemism for what is really a dredge and fill project on the beach, with many of the negative environmental impacts typically associated with dredging and filling generally. The dredging of sand itself is also a significant impact to sea turtles. Dredging may impact the sea turtles' habitat, and it can also kill sea turtles by sucking them into the dredging equipment. In 2006 and 2007, the United States Army Corps of Engineers documented take of seventy-two sea turtles by dredging operations.[332]

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[325] C.R. Lebuff & E.M. Haverfield, Nesting Success of the Loggerhead Turtle (Caretta caretta) on Captiva Island, Florida—A Nourished Beach, 69, in Proceedings of the Eleventh Annual Workshop on Sea Turtle Biology and Conservation (1992), available at http://www.nmfs.noaa.gov/pr/pdfs/species/turtlesymposium1991.pdf.

[326] *See, e.g.* ATLANTIC STATES MARINE FISHERIES COMMISSION BEACH NOURISHMENT: A REVIEW OF THE BIOLOGICAL AND PHYSICAL IMPACTS 22 (2002) (citing Parr et al., 1978; Reilly and Bellis, 1978, 1983; Fletemeyer, 1980; Nelson and Dickerson, 1988; Ryder, 1991), available at http://www.asmfc.org/publications/habitat/beachNourishment.pdf.

[327] Katherine R. Butler, *Coastal Protection of Sea Turtles in Florida*, J. LAND USE & ENVT'L L. 1 (1998). at 5 n.115.

[328] Butler, at 5.

[329] *Id.* at 5 n.118.

[330] D.G. Rumbold, P. W. Davis & C. Perretta, *Estimating the Effect of Beach Nourishment on Caretta caretta (Loggerhead Sea Turtle) Nesting*, 9 RESTORATION ECOLOGY 304 (2001).

[331] Kelly A. Brock, Effects of a shore protection project on loggerhead and green turtle nesting activity and reproduction in Brevard County, Florida. M.S. Thesis, University of Central Florida, Orlando, Florida (2005).

[332] *See* United State Army Corps of Engineers, Total Turtle Takes by Calendar Year, available at http://el.erdc.usace.army.mil/seaturtles/takes.cfm?Type=Calendar.

Unfortunately, our understanding of the larger environmental impacts of beach nourishment remains woefully limited despite myriad studies.[333] Many beach nourishment impact studies fail to achieve basic scientific standards that would give adequate support to the conclusions they reach.[334] Most studies on the environmental impact of beach nourishment are conducted by private consultants—with an interest in the promotion of beach nourishment—without the benefit of anonymous peer review by experts in the subject matter,[335] and the state or federal agencies that review the studies often lack sufficient expertise in biostatistics to understand the failings of the studies they might have required as a permit condition.[336] As a result of the shortcomings of the research and the process, "the conclusions of beach nourishment studies are often flawed by lack of compelling support from adequate evidence, analysis, or interpretation."[337] In some cases this means that studies have reached the unjustified "conclusion" that no environmental impacts from the nourishment project existed.[338]

Nonetheless, we do have some information on the larger environmental impacts of nourishment in Florida. For example, the limestone-bedrock, hard-bottom reefs from St. Augustine to Ft. Lauderdale often support diverse communities of fish, invertebrates, and algae.[339] These hard-bottom reefs are also where much of the sand from nourishment projects on the east coast ends up, either immediately after nourishment, or eventually through wave-action. These reefs (and their associated habitats) are thus routinely buried or subjected to high turbidity, suffocating animals and blocking sunlight for plants.[340] The effects on the reefs, sand, animals, and plants from nourishment are countless; the following is only a brief summary of the impacts to nearshore and onshore areas.[341]

Over 325 species of invertebrates alone have been identified on nearshore reefs buried by nourishment projects, in addition to the numerous star corals, fire corals, and other species commonly buried by the dumped fill that is nourishment.[342] Nearshore and onshore plants are also impacted by nourishment projects. For example, the 1987 nourishment project at Key

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[333] Charles H. Peterson & Melanie J. Bishop, *Assessing the Environmental Impacts of Beach Nourishment*, 55 BIOSCIENCE 887 (Oct. 2005). Peterson and Bishop did a comprehensive review and analysis of 46 different studies of beach nourishment projects. *Id.* at 888.

[334] *See generally id. and id.* at 893.

[335] *Id.* at 894.

[336] *Id.*

[337] *Id.* at 893.

[338] *Id.*

[339] DAVID M. BUSH, ET AL, LIVING WITH FLORIDA'S ATLANTIC BEACHES: COASTAL HAZARDS FROM AMELIA ISLAND TO KEY WEST 101 (2004).

[340] *Id.* at 102.

[341] The nearshore and onshore areas comprise the area under 0-12 feet of water.

[342] LIVING WITH FLORIDA'S ATLANTIC BEACHES, *supra* note 339, at 109.

Biscayne directly buried more than 20 acres of seagrass beds.[343] These direct effects have the potential to alter many components of primary or secondary production, which in turn may result in potentially significant changes at higher levels of the food chain.[344]

Fisheries Impacts

"Despite decades of agency-mandated monitoring at great expense, much uncertainty about the biological impacts of beach nourishment [on fisheries] nonetheless exists."[345] However, it has at least been concluded that the nearshore system "is extremely biologically diverse and the abundant organisms found there appear to be important for nearshore fishes."[346] Although in the past, "most administrative reviews have concluded that the fish habitat value of nearshore hardbottom and the effects of dredge-based beach restoration projects are minimal . . .[,]"[347] this perception is changing with the growing evidence of nourishment's negative effects on hardbottom fisheries.

Damage caused by sedimentation and turbidity can have direct effects or indirect effects, or both. Burial is one such direct effect caused by sedimentation. In 1999 a study examined the direct effects of burial on 12-14 acres of nearshore reef at beach south of Jupiter Inlet.[348] The study found that after the burial, the number of fishes at the impact site decreased by 95%.[349]

Direct burial is a problem for many species which live on hardbottoms because unlike fish which live in sandy (soft) bottoms, many hardbottom species are sessile (attached to a base) and thus do not have the ability to burrow up through sediment piled on top of them.[350] Increased turbidity

[343] *Id.* at 109.

[344] Walter G. Nelson, *Beach Nourishment and Hard Bottom Habitats: The Case for Caution*, *in* PROCEEDINGS OF THE 1989 NATIONAL CONFERENCE ON BEACH PRESERVATION TECHNOLOGY 112 (Florida Shore and Beach Preservation Assocation, S. Tait, ed.).

[345] Charles H. Peterson and Melanie J. Bishop, *Assessing the Environmental Impacts of Beach Nourishment, BioScience*, 887, October 2005/Vol. 55 No. 10 (Although monitoring is required, many of these studies are inadequate in themselves in that they have used poor-scientific methods, have not been peer-reviewed, etc..)

[346] Nelson, *supra* note 344.

[347] Kenyon C. Lindeman & David B. Snyder, *Nearshore Hardbottom Fishes of Southeast Florida and Effects of Habitat Burial Caused by Dredging*, 97 FISHERY BULLETIN 508 (1999)[hereinafter Lindeman and Snyder].

[348] *Id.* at 109.

[349] *Id.* at 109.

[350] *Id.* This problem also results from increased silt loads following resuspension or redistribution. *Id.* The responses of fishes and invertebrates to nourishment projects are dictated in part by each individual species' relative degree of mobility and ability to deal with change. LIVING WITH FLORIDA'S ATLANTIC BEACHES, *supra* note 339, at 103-104. Essentially the questions are, "Can the animal move out of harm's way in time?" and "Can the animal survive long enough to find a new habitat?" *Id.* at 104.

directly affects any species that employ filter feeding, a feeding mode which tends to be common in hardbottom communities.[351] Moreover, "[i]ncreased turbidity, by decreasing light penetration, could also strongly affect algal abundance. Many of the smaller mobile animals of hardbottoms are associated with the attached macroalgae and would have difficulty if their algal substrate were lost."[352] These effects and others were studied by Kenyon C. Lindeman and David B. Snyder and their results present an interesting and informative case study of the impacts of nourishment on fisheries.

Kenyon C. Lindeman and David B. Snyder's study, "Nearshore Hardbottom Fishes of Southeast Florida and Effects of Habitat Burial Caused by Dredging," quantified nearshore fish assemblages on the southeast coast of mainland Florida over a 27-month period to examine three objectives. The objective with the most relevance here examined the effects of dredge burial on numbers of individual fish and species.[353] This objective was examined with the hypothesis that "numbers and species would *not* differ significantly between an impact site where almost all the hardbottom was buried and a control site that was unaffected by the burial."[354] To test this hypothesis the study essentially counted the number and types of fish before and after a burial caused by nourishment at one site, and at matching times at a site where no burial occurred.[355]

The results revealed that adults of at least half of the top ten species present at their relative sites occurred there as residents, not transients.[356] Even more, "[n]ewly settled and juvenile stages often appeared to display more site-fidelity with hardbottom structure than did adults."[357] Translated, this means that the studied fish tend to stay in one area during their different life-stages, thus implying that fish do not have a great degree of mobility and may not be adapted or willing, to "move out of harm's way in time." This result begs the question, "So what happens to the fish?"

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[351] Nelson, *supra* note 344.at 112.

[352] *Id.* at 112-113.

[353] Lindeman and Snyder, *supra* note 347, at 509.

[354] Lindeman and Snyder, *supra* note 347, at 509 (emphasis added).

[355] "A beach restoration project occurred at Carlin Park in March and April of 1995. More than 350.000 m^3 of beach-compatible sediments were excavated by a cutter-head dredge from a site 0.8 km offshore and hydraulically pumped along 1.8 km of shoreline. Bulldozers extended the fill seaward to an estimated width of 60 m. An estimated total of 4.9 to 5.7 ha (12-14 acres) of nearshore hardbottom was buried. Visual surveys of fishes were conducted for 12 months before burial and 15 months after burial at both Carlin Park (the impact site) and Coral Cove (the control site) . . . . [The relevant objective which examined] dredging effects at the impact site (Carlin Park) and the control site (Coral Cove), employed a BACIPS (before after control impact paired series) design . . . . This approach compares differences in variables between sites over time before and after impact. The differences in the paired series were examined by two sample *t*-tests by using the mean number of both individuals and species as the variables . . . ." Lindeman and Snyder, *supra* note 347, at 510-511.

[356] *Id.* at 513.

[357] *Id.*

The study found that prior to burial, fish populations at the two sites were similar in species composition and relative abundance.[358] However, the hypothesis that the sites would experience no differences in total numbers of individuals and species before and after burial was rejected.[359] In fact, "[n]o fishes . . . were recorded in the first postdredging surveys at Carlin Park."[360] Beyond the first recording, the study found that the burial of the Carlin Park nearshore hardbottom significantly lowered the quantities of both species and individuals.[361] Specifically, "[b]efore burial, 54 species were recorded, with mean abundances of 38 individuals and 7.2 species per [count]. After burial, eight species were recorded with mean abundances of less than one individual and species per [count]."[362] This means that there was roughly an 85%, 97%, and 86% drop in the number of species, the mean abundances of species, and species per transect respectively after the burial caused by the nourishment project.

The results from the study also showed that the assumptions from the Carlin Park Environmental Impact Assessment (EIS) done prior to the nourishment project were tenuous. The EIS "emphasized the variable nature of reef exposure and forecast that fish impacts would be minimal and temporary. Primary impacts predicted for fishes were 1) short-term displacement during construction; and 2) temporary loss of food sources." However, the study found that displacement is permanent for most individuals because almost all the pre-existing habitat is eliminated for at least 15 months following a burial.[363]

Finally, the study found that "the cumulative effects on fishes of repeated burial of nearshore habitats and other byproducts of these projects remain unknown."[364] In addition, the study concluded that the temporal and spatial effects which nourishment can have on fisheries are rarely considered.[365] Thus, the study posited that at the very least, considering the drastic effects on fisheries from this case study, more research on the effects of fisheries is needed before the State of Florida continues to pursue nourishment as a strategy in beach preservation.[366] Even assuming that the adverse affects on coastal ecosystems were eliminated or reduced, other factors may prevent nourishment from remaining a viable solution in the long-term.

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[358] *Id.* at 516.

[359] *Id.*

[360] Lindeman and Snyder, *supra* note 347, at 516.

[361] *Id.* at 520.

[362] *Id.*

[363] *Id.*

[364] *Id.* at 521.

[365] Lindeman and Snyder, *supra* note 347, at 521. This is especially disturbing considering that "[m]arine populations may respond to reductions in water quality over time scales of decades, masking effects that may be cumulatively large." LIVING WITH FLORIDA'S ATLANTIC BEACHES, *supra* note 339, at 108.

[366] Lindeman and Snyder, *supra* note 347, at 521.

4. Sand Availability

One reason that the cost of sand is increasing as that there is less and less beach-quality sand readily accessible for dredging and placing on the beaches. In 2007, Miami had already run out of sand and wanted to go the Bahamas to import sand.[367] Also in 2007, the Florida Legislature acknowledged that "beach-quality sand for the nourishment of the state's critically eroded beaches is an exhaustible resource"[368] and required DEP to assess sand sources for nourishment.

5. Can Sand Withstand Sea Level Rise?

The science does not yet appear clear on how well nourishment will address beach migration due to SLR. While at least one engineer claims that SLR will add only a small additional cost to beach nourishment projects,[369] this does not seem clear. Questions remain as to how much sand it takes to raise the beach profile (including the profile underwater, as much of the active beach is under water) and stop beach migration.

6. The Energy Requirements of Nourishment

Nourishment requires not only sand but also extensive equipment—and tremendous amounts of fuel to run this equipment. As the cost of fuels has increased, it is to be expected that nourishment activities will cost more as well. In addition, long-term reliance on nourishment and its dependence on fossil fuels that emit greenhouse gases when used creates a potential conflict with Florida's new focus on cutting greenhouse-gas emissions.[370]

Despite increasing recognition of its environmental problems, beach nourishment remains Florida's reaction to coastal migration. Many factors gathering on the horizon may come together to limit the future usefulness of nourishment as a way to satisfy the desire for both a dynamic beach and coastal development next to the beach.

7. Legal Challenges to Nourishment

The current jurisprudence relating to riparian rights and nourishment is in a state of uncertainty at the moment. In April of 2006 Florida's First District Court of Appeals handed down its decision in the case of *Save Our Beaches, Inc. v. Florida, Department of Environmental*

[367] *See, e.g.* Amy Green, Christian Science Monitor, Would It Still Be Miami Beach With Foreign Sand? (May 16, 2007).

[368] FL. STAT. § 161.44 (2007).

[369] *See, e.g.* Mike Campbell, Beach Nourishment Can Address Sea Level Rise, article in the October 2006 "Shorelines" (newsletter of the Florida Shore and Beach Preservation Association), page 5.

[370] *See, e.g.* Executive Order 07-126 ["Leadership by Example: Immediate Actions to Reduce Greenhouse Gas Emissions from Florida State Government"]; Executive Order 07-127 ["Immediate Actions to Reduce Greenhouse Gas Emissions within Florida"]; Executive Order 07-128 ["Florida Governor's Action Team on Energy and Climate Change."].

Protection,[371] but the case has been appealed to the Florida Supreme Court.[372] Until such time as the Florida Supreme Court rules on the appeal, the District Court of Appeals' analysis sheds some interesting light on the future of nourishment in the State of Florida.

In *Save Our Beaches* the appellants challenged a 2005 final order entered by the Florida Department of Environmental Protection which determined that a Joint Coastal Permit and Authorization to Use Sovereign Submerged Lands was properly issued.[373] The permit was to allow the nourishment of 6.9 miles of beaches and dunes in Destin, Florida.[374] Specifically, the appellants argued that the final order deprived riparian landowners of their constitutionally-protected riparian rights without just compensation.[375] The District Court of Appeal, in the instant case, had to determine first whether the appellants actually possess the riparian rights they claimed, and second, whether those rights were eliminated by the DEP's final order.[376]

The District Court of Appeals ultimately held that the appellants indeed had riparian rights to 1) receive accretions and relictions to their property, and 2) have their property's contact with the water remain intact.[377] Moreover, the District Court of Appeals held that the DEP's final order eliminated these rights without just compensation.[378]

Any nourishment project is going to affect riparian owners, either directly or indirectly. In the *Save Our Beaches* case, the nourishment project was going to add sand to the Destin beaches in such a way that the mean-high water line would "move" seaward. As a result "new" beach, belonging to the State, would be created seaward of the appellants' property. The potential loss of riparian rights created by this "new" beach was at issue in the case.

In explaining its holding the District Court first described how the DEP and an administrative law judge had interpreted the law. The DEP had adopted the administrative law judge's (ALJ) ruling that the nourishment project would not unreasonably infringe upon the riparian rights of the landowners.[379] The ALJ had noted that although the right to accretion is a riparian right, that right would be eliminated under the pertinent statutes upon a recording of the erosion control

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[371] 937 So.2d 1099 (1st DCA, 2006).

[372] Review granted by Florida Dept. of Environmental Protection v. Save Our Beaches, Inc., 937 So.2d 1099 (Fla. Sep 25, 2006).

[373] Save Our Beaches, Inc. v. Florida Department of Environmental Protection, No. 1D05-4086, slip. Op. 1 (Fla. Dist. Ct. App. Apr. 28, 2006) [hereinafter Save Our Beaches].

[374] Save Our Beaches, *supra* note 371, at 1.

[375] *Id.*

[376] *Id.* at 8.

[377] *Id.* at 8.

[378] *Id.*

[379] Save Our Beaches, *supra* note 371, at 3.

line.[380] Specifically, the ALJ pointed to F.S. §161.161(3), which directs the government to survey the beach to be protected by the project and locate an erosion control line.[381] The ALJ then found that Florida Statute section 161.191 provides that this erosion control line becomes the new property boundary, thus denying upland landowners any property gained by accretion.[382] After reviewing this history the District Court of Appeals summarized that "[t]he Department, in its final order, essentially ruled that there is no infringement of any riparian rights because the statutes say there is not."[383] The District Court of Appeals did not agree.

In rejecting the DEP and ALJ's approach the District Court of Appeals established that "[r]iparian rights are property rights that cannot be constitutionally taken without just compensation."[384] These riparian rights include the right of access to the water, including the right to have one's property's contact with the water remain intact, in addition to the right to receive accretions.[385] Thus the District Court of Appeals found for the appellants on the first issue in that they indeed had the riparian rights that they argued were taken without compensation. The only issue that remained was whether the DEP's final order would deprive the appellants of their riparian rights to accretion and contact.

The parties agreed that the nourishment project would cause the high water mark to move seaward and that *ordinarily* this would result in the upland landowners gaining property by accretion.[386] However, since Florida Statute section 161.191(2) states that "the common law shall no longer operate to increase [by accretion] . . . the proportions of any upland property lying landward of such line . . ." the DEP's final order effectively deprived the landowners of their riparian accretion rights.[387] In addition, since the property boundary would remain fixed while the high water mark would move seaward, the landowners would also lose their riparian right to have the property remain in contact with the water.[388] Thus, the District Court of Appeals held that DEP's final order would indeed deprive the appellants of their riparian rights and "if the [nourishment] project cannot be accomplished without the taking of private property, the taking must be made by the [DEP] by eminent domain proceedings."[389]

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[380] *Id.*

[381] *Id.*

[382] *Id.* at 4.

[383] *Id.* at 5.

[384] Save Our Beaches, *supra* note 371, at 7 (citing Bd. of Trs. Of the Internal Improvement Trust Fund v. Sand Key Assocs., Ltd., 512 So. 2d 934, 936 (Fla. 1987)). The term riparian owner includes those whose land abuts the ocean. *Id.* (citing Thiesen v. Gulf, F. & A. Ry. Co., 75 Fla. 28, 78 So. 491, 506 (1918)).

[385]Save Our Beaches, *supra* note 371, at 7.

[386] *Id.* at 10.

[387] *Id.*

[388] *Id.*

[389] *Id.* at 11 (citing §161.141, Florida Statutes (2005)).

The fact that just compensation must be paid for takings which result from nourishment projects is not the end of the matter though. "Florida's law is clear that riparian rights cannot be severed from riparian uplands absent an agreement with the riparian owner, not even by the power of eminent domain."[390] Under this interpretation, when the government completes a nourishment project, the newly "created" land would become the property of the landowner. The government could not take it, even through eminent domain, without the consent of the landowner. Thus the landowner would gain valuable beach front property at no expense to the landowner, and the government would not even be able to claim the land it created by eminent domain and payment unless the landowner agrees.

The decision in *Save Our Beaches* is thus intriguing if it remains valid, because it will mean that Florida law recognizes that 1) nourishment projects may result in takings, 2) such takings require just compensation, 3) any accretion caused by the nourishment project is the property of the riparian landowner, and 4) the government may not buy the accreted land unless it has the assent of the landowner. Such a holding would mean that the cost of nourishment projects will only increase, as the government will now not only have to pay for the nourishment project itself, but also will have to pay again in order to reap the "benefits" of the nourishment.[391]

Another legal challenge to nourishment is currently underway in the administrative law system. The Surfrider organization and others have challenged a permit issued by DEP to the Town of Palm Beach to conduct nourishment activities.[392] The petitioners challenge the permit and the variance to water quality standards issued by DEP. Petitioners assert that the project will result in burial of hardbottom areas and sedimentation problems.[393]

D. *The Coastal Construction Control Line Program: Determining the Long-Term Fate Florida's Beaches*

In addition to nourishment, the Coastal Construction Control Line (CCCL) program plays a crucial role in beach management in Florida. Evidence indicates that during the thirty years since the CCCL program was first established, and despite many changes to the program during three decades, the CCCL program has in the past and continues to allow major habitable structures so close to the beach that the structures then become threatened by erosion and impact sea turtle nesting habitat, leading to calls for armoring and/or expensive—and environmentally damaging—nourishment. The following sections examine the CCCL program.

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[390] Save Our Beaches, *supra* note 371, at 10 (citing Belvedere Dev. Corp. v. Dep't of Transp., 476 So. 2d 649 (Fla. 1985)).

[391] Moreover, since the landowner's assent is necessary even for eminent domain in this case, the landowner will be able to name his price. Considering that we are dealing with extremely valuable ocean-front property, the additional costs of nourishment are potentially enormous.

[392] Dept. of Admin. Hearings file number 08-001511.

[393] These same problems were observed in a previous dredging and beach nourishment project conducted in the area—the "Reach 7" project.

1. Overview of Statutory Provisions

In 1965 Florida created the Beach and Shore Preservation Act[394] in recognition of the importance of Florida's beaches to the state's economy and ecology. Regulation under the Beach and Shore Preservation Act[395] began in 1970 with establishment of a 50 foot setback line for construction on the state's sandy beaches. In 1971, the Florida Legislature created the coastal construction setback line (CCSL), which in 1978 was altered to become the coastal construction control line (CCCL) program. While the CCSL had been a line seaward of which construction was prohibited, the CCCL did not prohibit construction seaward of the line but did subject such construction to additional regulation of siting and design.[396] In 1985 the Florida Legislature again added a setback line for areas with an established CCCL. This line is the 30-year erosion projection (30-yr. EPL).[397] The 30-yr. EPL prohibits construction of major habitable structures seaward of the line, with the notable exception of some single-family homes.

The CCCL program, with significant changes, continues today. The stated purpose of the CCCL program is "to preserve and protect [Florida's beaches] from imprudent construction which can jeopardize the stability of the beach-dune system, accelerate erosion, provide inadequate protection to upland structures, endanger adjacent properties, or interfere with public beach access."[398] The CCCL program is administered by the Department of Environmental Protection's Bureau of Beaches and Coastal Systems.

The CCCL program states that no one "shall construct any structure whatsoever seaward [of the CCCL]; make any excavation, remove any beach material, or otherwise alter existing ground elevations; drive any vehicle on, over, or across any sand dune; or damage or cause to be damaged such sand dune or the vegetation growing thereon seaward thereof" except with a permit or pursuant to an exemption in the CCCL program.[399] CCCLs are established on a county basis along the sandy beaches of the state.[400] Sandy beaches in counties that do not have an established CCCL continue to use the 50 foot setback line established by Florida Statute section 161.052.[401] While the CCCL regulatory program does regulate construction of any structure in

[394] Laws of Florida, ch. 65-408 (1965).

[395] Parts I and II, Chapter 161, Florida Statutes (§§ 161.011-.45).

[396] *See, e.g.* BUREAU OF BEACHES AND COASTAL SYSTEMS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, THE HOMEOWNER'S GUIDE TO THE COASTAL CONSTRUCTION CONTROL LINE PROGRAM 2 (Feb. 2006).

[397] Laws of Florida, ch. 85-55 (1985).

[398] FLA. STAT. § 161.053 (2007).

[399] FLA. STAT. § 161.053(2)(a) (2007).

[400] FLA. STAT. § 161.053(1)(a) (2007).

[401] FLA. STAT. § 161.053(11) (2007). One example of an area without erosion control lines is Monroe County, which contains the Florida Keys.

the CCCL zone, the focus in this review is on major habitable structures[402] and coastal armoring structures[403] as these are the structures that have the greatest impact on the long-term viability of beaches as dynamic turtle nesting habitat and on beach management options in the face of shoreline migration.[404] Statutes do not create a very clear substantive standard by which to measure the effect of the potential impacts for issuance of permits. Statutes do require that the evidence, in DEP's opinion, "clearly justif[ies]" the requested permit.[405] How should DEP measure this? By the impacts on the beach-dune system and whether the permit will "ensure the protection of the beach-dune system, proposed or existing structures, and adjacent properties and the preservation of public beach access."[406] Thus, the question that should guide analysis of the CCCL program is whether it indeed assures protection of the beach-dune system, proposed or existing structures, and adjacent properties and the preservation of public beach access.

Section 161.053 of the Florida Statutes governs the permitting of major habitable structures such as hotels, condominiums, apartments, and homes in areas with a CCCL. Permitting of major habitable structures relies on siting and design requirements to further the goal of protecting the beach dune system.[407] Permits may be issued upon consideration of engineering data related to shoreline stability and stormtides, design features of the proposed structure, and the potential impacts of the proposed structure.[408] If adjacent structures have established a reasonably continuous and uniform construction line closer to mean high water, and such structures have not been unduly affected by erosion, a permit may issue further seaward than otherwise might be appropriate.[409] A permit may limit the nature, timing, and sequence of construction to protect sea turtles, native salt-resistant vegetation, and endangered plant communities.[410] Permits shall also limit construction which interferes with public access across the beach.[411] Beginning in

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[402] These include structures such as houses, condominiums, multi-family dwellings, restaurants, and hotels. FLA. ADMIN. CODE r. 62B-33.002(59)(c)1.

[403] Coastal armoring includes revetments, bulkheads, seawalls, and geotextile tubes.

[404] Development of infrastructure such as roads and sewer lines contribute significantly to the demand for and growth in major habitable structures. Thus, it is imperative that comprehensive planning for infrastructure consider the dynamic nature of the beach-dune system and sea-level rise.

[405] FLA. STAT. §161.053(5)(a)3 (2007).

[406] FLA. STAT. §161.053(1)(a) (2007). The substantive standard applied by DEP in its permitting review is "no significant adverse impact." FLA. ADMIN. CODE r. 62B-33.005(3)(a) ("After reviewing all information required pursuant to this rule chapter, the Department shall: Deny any application for an activity which either individually or cumulatively would result in a significant adverse impact including potential cumulative effects.").

[407] FLA. STAT. § 161.053(5) (2007).

[408] *Id.* at § 161.053(5)(a) (2007).

[409] *Id.* at § 161.053(5)(b) (2007).

[410] *Id.* at § 161.053(5)(c) (2007).

[411] *Id.* at § 161.053(5)(d) (2007).

1985, the Legislature added a setback line to areas with a CCCL line.[412] This new line was the 30-year erosion projection line (30-yr. EPL).[413] The 30-yr. EPL represents the line, based on site-specific historical trends and topography, of where the mean high water line will be in thirty years.[414] The 30-yr. EPL does not account for likely future movements of the beach due to sea level rise, thus sometimes resulting in a determination that the 30-yr. EPL is at the current water line.[415] The 30-yr. EPL provisions prohibit permits for construction seaward of the 30-yr. EPL for anything other than shore protection structures, piers, other minor structures, intake/discharge structures,[416] or certain single-family homes.[417]

The state's policy on rigid coastal armoring[418] specifies that armoring permits may be granted to protect private structures or public infrastructure vulnerable to frequent coastal storms,[419] to close gaps of less than 250 feet in existing armoring,[420] and for use of geotextile tubes in dune reconstruction.[421] DEP rules indicate that only "eligible" private structures may be armored. A structure is eligible if it is "non-conforming,"[422] and non-conforming means "any major habitable structure which was not constructed pursuant to a permit issued by the Department [of Environmental Protection] pursuant to Section 161.052 or 161.053, F.S., on or after March 17, 1985."[423]

The statutory section on armoring also grants local governments the authority to install or permit temporary, emergency armoring.[424] Armoring below the mean high water line is subject to the provisions of section 161.041, which requires a permit for such construction[425] and allows issuance upon consideration of engineering data related to shoreline stability and stormtides,

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[412] This setback line does not affect structures intended for shore-protection purposes. FLA. STAT. § 161.053(6)(b) (2007).

[413] *Id.* at § 161.053(6) (2007).

[414] *Id.* at § 161.053(6)(b).

[415] *See, e.g.* DEP memorandum to DEP Permit File Number: ST-1137, from S. Muthuswamy, Ph.D. (Dec. 16, 1996).

[416] FLA. STAT. § 161.053(6)(b) (2007).

[417] *Id.* at § 161.053(6)(c) (2007).

[418] *Id.* at § 161.085 (2007).

[419] *Id.* at § 161.085(2)(a) and (b) (2007).

[420] *Id.* at § 161.085(2)(c) (2007).

[421] *Id.* at § 161.085(9) (2007).

[422] FLA. ADMIN. CODE r. 62B-33.0051(1)(a)1.

[423] FLA. ADMIN. CODE r. 62B-33.002(43).

[424] FLA. STAT. §§ 161.085(3) through (8) (2007).

[425] *Id.* at § 161.041(1) (2007).

design features of the proposed structure, and the potential impacts of the proposed structure.[426] Armoring above the mean high water line is subject to 161.053,[427] which allows for issuance of permits after consideration of a virtually identical list of factors.[428]

a. The CCCL

The CCCL demarcates the extent of "the beach-dune system subject to severe fluctuations based on a 100-year storm surge, storm waves, or other predictable weather conditions."[429] The statute further provides that CCCL's shall be established by the DEP only after it has been determined that the CCCL is needed to protect upland properties and control beach erosion. Next, the statute provides that a public hearing must be held and affected persons must be given the opportunity to be heard. Following the hearing, the CCCL becomes effective upon filing with the Department of State. After the line becomes effective, it is a violation of the statute to develop seaward of the line without a permit.[430]

b. Calculating the CCCL

The basis of the CCCL is the line created by calculations of the 100-year storm surge. The 100-year storm surge can be defined as that surge that has a 1% chance of occurring in any given year. It does not necessarily correlate to the 100-year storm. Storm surge is defined as:

> "An abnormal rise in sea level accompanying a hurricane or other intense storm, and whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone. Storm surge is usually estimated by subtracting the normal or astronomic high tide from the observed storm tide."[431]

Use of the storm surge as indicator has two inherent difficulties; first, if measurements are taken post-storm by using the visible water line, it is difficult to measure the height of the storm surge as opposed to the height of the storm wave, and second, the storm surge is not necessarily the highest point the water will reach during a storm, nor is it the most dangerous aspect of a storm. The waves of a storm can be especially destructive; wave setup is defined as "the super-elevation of the water surface above storm surge level due to onshore mass transport of the water by wave

[426] *Id.* at § 161.041(2) (2007).

[427] *Id.* at § 161.053(9) (2007).

[428] *Id.* at § 161.053(5)(a) (2007).

[429] *Id.* at § 161.053(1)(a) (2007).

[430] FLA. STAT. §161.053(2)(a) (2007). DEP "has authority to regulate by the permitting process all coastal construction activity: that is all activity that is likely to have a material physical effect on the existing coastal conditions or natural shore and inlet processes." Town of Palm Beach v. Department of Natural Resources, 577 So. 2d 1383, 1386 (Fla. 4th Dist. Ct. App. 1991).

[431] National Hurricane Center, http://www.nhc.noaa.gov/aboutgloss.shtml

action alone."[432] Therefore, storm surge does not indicate the level of water that is most dangerous during a storm, and may not be the best indicator to use in setting the CCCL, a line intended to protect structures.

However, the 100-year storm surge is not the only criteria used in calculating the CCCL. The 100-year storm surge is used to calculate the beach/dune erosion limits, wave action effects, and wave run-up. These three elements, plus topographic and hydrographic data, are used to calculate the control line. In summary, the CCCL analysis uses the following factors: topographic factors including dune elevations, foreshore slopes, offshore slopes, beach widths, adjacent profiles, upland development, and vegetation bluff lines; and dynamic factors including storm tide elevations, storm tide erosion, erosion trends, wave action effects, and fluctuations of beach profiles. It is not always clear how these factors are weighed or considered in determining the CCCL.[433]

c. Establishing the CCCL

The political process of establishing the CCCL can be more time-consuming than the actual research to calculate the CCCL. The calculations generally take approximately 6 months to 1 year to complete, while the administrative process of approving the CCCL has been known to take up to 7 years.[434]

The process of establishing the CCCL is an administrative rulemaking process carried out by the Department of Environmental Protection. Therefore, the process follows the rules set forth by the Florida Administrative Procedure Act, subject to certain restrictions, discussed below. The process is also subject to Florida Statute §161.052(2)(a), which requires that the Department hold a public hearing allowing for all affected persons to have an opportunity to be heard. The Department is also required to publish notice of the hearing in Florida Administrative Weekly. Notice is also usually published in local newspapers and other publications.[435]

Florida statute section 161.053(2) prevents private property owners and local governments from becoming grandfathered into building inside the CCCL by taking advantage of the 20-day waiting period between the time that a CCCL (regarded as a rule) is filed with the Office of the

[432] ROBERT G. DEAN, ET AL., BEACHES AND SHORES RESOURCE CENTER, COASTAL CONSTRUCTION CONTROL LINE REVIEW AND REESTABLISHMENT STUDY FOR PINELLAS COUNTY 9 (December 2000), available at http://beach10.beaches.fsu.edu/pinellas.html

[433] *Cf., e.g.* BEACHES AND SHORES RESOURCE CENTER, COASTAL CONSTRUCTION CONTROL LINE REVIEW AND REESTABLISHMENT STUDY FOR PINELLAS COUNTY 14-15 (revised December 2000), available at http://beach10.beaches.fsu.edu/pinellas.html.

[434] Telephone interview with Dr. Todd L. Walton, Jr., Director, Beaches & Shores Research Center, Florida State University, March 27, 2008

[435] Telephone interview with Rosaline Beckham, Environmental Specialist III, Beaches & Coastal Systems, Florida Department of Environmental Protection, April 2, 2008

Secretary of State and the effective date of the rule. This does not, however, stop property owners from taking similar advantage of the months—or years—it takes to update CCCLs

d. Review and Re-establishment of the CCCL

The calculation of the CCCL takes into account several factors, many of which change over time. Therefore, it is necessary to continually update the CCCL to maintain its purpose as a line of protection. Neither the statutes nor the rules provide an exact time frame within which the CCCL must be updated. However, papers relied on by the Department of Environmental Protection state that the long-term erosion calculation included in the CCCL allows for an estimation of 5 years of long-term erosion.[436] Therefore, the CCCL would need to be updated at least every 5 years to maintain the supposed validity of the long-term erosion calculation. In reality CCCLs are infrequently updated and usually drastically out-of-date.

The re-establishment of the CCCL is governed by Florida Statute §161.053(2)(a), which states:

> "…Control lines established under the provisions of this section shall be subject to review at the discretion of the department after consideration of hydrographic and topographic data that indicate shorelines changes that render established coastal construction control lines to be ineffective for the purposes of this act or at the written request of officials of affected counties or municipalities."

The impetus for either of these actions is not clear. Neither the statute nor the rules provide a timeline within which each CCCL must be reviewed, nor do they provide a timeline for studies that may indicate need for review.

History of the Reestablishment Of Coastal Construction Control Lines
Pursuant to Section 161.053, Florida Statutes:

COUNTY	FLORIDA ADMINSTRATIVE CODE	DATE RE-ESTABLISHED
Broward	62B-26.013	November 1981
Dade	62B-26.012	February 1982
Walton	62B-26.001	December 1982
Nassau	62B-26.005	April 1983
Franklin	62B-26.014	April 1984
Charlotte	62B-26.006	January 1985
Martin	62B-26.015	July 1985
Gulf	62B-26.016	February 1986
Escambia	62B-26.002	June 1986
Brevard	62B-26.017	December 1986

[436] T.Y.CHIU & ROBERT G. DEAN, BEACHES AND SHORES RESOURCE CENTER, METHODOLOGY ON COASTAL CONSTRUCTION CONTROL LINE ESTABLISHMENT 70 (June 2002), available at http://www.dep.state.fl.us/beaches/publications/tech-rpt.htm#CCCL_Methodology.

Indian River	62B-26.018	March 1987
Manatee	62B-26.008	August 1987
St. Johns	62B-26.019	January 1988
Flagler	62B-26.020	April 1988
St. Lucie	62B-26.021	September 1988
Sarasota	62B-26.009	January 1989
Collier	62B-26.022	June 1989
Volusia	62B-26.023	January 1991
Lee	62B-26.007	May 1991
Okaloosa	62B-26.003	December 1991
Duval	62B-26.004	July 1992
Bay	62B-26.024	February 1997
Palm Beach	62B-26.010	August 1997
Pinellas	62B-26.011	December 2001

Source: http://www.dep.state.fl.us/beaches/publications/worddoc/reestabh.doc

Currently, Gulf and Walton counties are in the process of re-establishing the CCCL, at the recommendation of the Coastal High Hazard Study Committee (discussed below).

e. Challenges to the CCCL

In the 1986 case of *Island Harbor Beach Club v. DNR* [437] the court evaluated the establishment procedures used by the DNR (Department of Natural Resources, precursor to the current Florida Department of Environmental Protection) to establish the CCCL and found them to be valid based on the complex matter and methodology used by the DNR. The outcome of this decision is that it is difficult for private stakeholders to challenge the validity or accuracy of CCCLs set by the DEP.

Nonetheless, statutes provide a way for landowners to challenge the line, but only if the line is too restrictive and should be moved seaward, not for challenges that the line is not restrictive enough and should be moved landward. The statute states:

> "…Any riparian upland owner who feels that such line as established is unduly restrictive or prevents a legitimate use of the owner's property shall be granted a review of the line upon written request."[438]

The ramifications of this statute are that a citizen may not challenge the line unless he/she is a landowner desiring to move the line seaward. This means that there may never be challenge to the line asserting that the line should be moved landward. This removes an essential check on the Department because citizens may not urge the Department to increase protections on the beach and shoreline by moving the line landward. Therefore, the decision to increase protections

[437] 495 So. 2d 209, rev. denied 503 So. 2d 327 (1986).

[438] FLA. STAT. §151.053(2)(a)(2007).

and move the line is left solely within the discretion of the Agency. The only other outlet that citizens may have is to make use of the provision allowing for review of the CCCL upon written request by counties or municipalities. Citizens may urge the municipality or county to make such a request. However, past instances of CCCL re-establishment have shown that counties are generally opposed to the review because of economic implications of moving the CCCL: local governments fear that a CCCL further landward will decrease property values, leading to decreased property tax revenue for the local government.

As stated, the procedures for establishment of the rule are set forth in the Florida Administrative Procedure Act, Florida Statue Chapter 120. However, Florida Statute §161.053(2)(a), which controls setting of the CCCL, states that some of the rulemaking provisions do not apply to the setting of the CCCL. Chapter 161 provides that neither §120.56(2) nor §120.54(3)(c)(2) apply to setting of the CCCL. These sections provide for challenges to proposed rules and to rulemaking proceedings, respectively. Chapter 161 does allow for §120.56(3) challenges, which are challenges to existing rules. Therefore, one may not challenge the line or its procedures before the CCCL is set, only after the CCCL has been set may one officially challenge the rule. The public has access to the rulemaking procedure via the required public hearings, but may not officially challenge a CCCL until *after* the line is set.

Challenges to a CCCL typically occur tangentially via a permit challenge where an applicant challenges a denied permit.[439] In these cases, the applicant would likely be asserting that the line is too far landward and that the applicant was wrongly denied the permit. Occasionally, an environmental group will challenge a permit asserting the permit was wrongly granted and so arguing against the placement of the CCCL as well.[440] These challenges are not to the CCCL itself, but instead to the permit granted allowing the applicant to build seaward of the CCCL. Given the statutory restrictions on challenges to the CCCL, challenges to the permit are often the only way to contest the CCCL, especially if the challenger is arguing the CCCL is too far seaward.

In 2005 the Coastal High Hazard Study Committee was created, which is "charged with studying and formulating recommendations for managing growth in Coastal High Hazard Areas, which are defined as the Category 1 hurricane evacuation zone."[441] The Committee has provided some recommendations and led to studies for the re-establishment of CCCL lines in several counties in the Panhandle region of Florida.[442] In addition to these recommendations, the Committee made

[439] Florida Statute §161.212 allows for judicial review of permits and licenses, stating, "Any person substantially affected by a final action of any agency with respect to a permit may seek review…"

[440] Telephone interview with Gene Chalecki, P.E., Program Administrator, Beaches & Coastal Systems, Florida Department of Environmental Protection, April 3, 2008

[441] Coastal High Hazard Study Committee Website, http://www.dca.state.fl.us/fdcp/DCP/chhsc/index.cfm

[442] Telephone interview with Gene Chalecki, P.E., Program Administrator, Beaches & Coastal Systems, Florida Department of Environmental Protection, April 3, 2008

some other pertinent recommendations, including updating models used to calculate the CCCL and re-evaluating setbacks and dune protection criteria. [443]

f. Construction Landward of Existing Armoring

Section 161.053(2)(b) provides an exemption from certain siting and design criteria for structures located landward of existing armoring.[444] Structures may be built landward of existing armoring and seaward of the CCCL if the structure is sited to allow for maintenance of the armoring, located at or landward of the existing line of construction, is designed to comply with the windload requirements of the Beach and Shore Preservation Act, and is sited and designed to protect marine turtles.[445]

g. Cumulative Impacts

Florida Statutes specify that cumulative impacts are to be considered in reviewing a permit application.[446] Unfortunately, consideration of cumulative impacts appears to be a virtually useless exercise. Examples of the failure to effectively apply cumulative impacts analysis in other contexts abound.[447] As noted in a report required by the Coastal Zone Management Act,

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[443] THADDEUS COHEN, ET AL., FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS, COASTAL HIGH HAZARD STUDY COMMITTEE FINAL REPORT 15-19 (February 2006), available at http://www.dca.state.fl.us/fdcp/DCP/chhsc/final031306.pdf.

[444] Section 161.053(2)(b) provides that "1. The department shall exempt construction proposed for a location seaward of a coastal construction control line and landward of existing armoring from certain siting and design criteria of this chapter, provided the armoring is capable of protecting the proposed construction from the effects of erosion from a 100-year storm surge. The exemption shall apply to proposed structures involving the foundation, siting, and excavation criteria of this section, except such structures shall be:

a. Sited a sufficient distance landward of the armoring to allow for maintenance of the armoring.

b. Located up to or landward of the established line of construction.

c. Designed to comply with the windload requirements of this section.

d. Sited and designed to protect marine turtles."

[445] It is hard to imagine how any siting requirements could help protect sea turtles from a structure behind armoring. Assuming that the armoring is exposed, the armoring itself may affect sea turtles because it may eliminate prime nesting habitat and may cause increased "false crawls" in which a sea turtle fails to lay her eggs. The only design requirement that could help protect sea turtles in such a situation would be to eliminate lighting affecting the beach.

[446] FLA. STAT. §161.053(5)(a) (2007).

[447] For example, in permitting by the U.S. Army Corps of Engineers, many scientists have complained that the need to examine cumulative impacts has become a meaningless administrative recital without any scientific basis. *See* Letter to Colonel Joe R. Miller, District Engineer, Jacksonville District, Army Corps of Engineers from 70 Ph.D. Scientists, June 27, 2000, available at http://www.edf.org/documents/457_BeachDredgingLetter2000.pdf.

> Addressing the indirect consequences of individual projects has a limited effect on managing the broad-based environmental impacts commonly associated with accelerated growth and development and other significant land use changes.[448]

Similarly, up until recently, "cumulative impacts" assessment had been of little value in protecting wetlands.[449]

h. "Line of construction"

The "line of construction" provision[450] in statute is actually more of the rule itself rather than an exception to the rule. This provision allows that if there is a "reasonably continuous and uniform line of construction closer to the mean high water than the foregoing. . .", a proposed major habitable structure may be permitted along this line. The statement that the Department of Environmental Protection "may" permit construction up to the existing line of construction actually means that, absent exceptional circumstances, applicants are entitled to a permit up to the "line of construction."[451]

In addition, the line of construction appears in another part of the Beach and Shore Preservation Act. The exemption from siting and design requirements for construction landward of existing armoring specifies that such construction must be at or landward of the existing line of construction.[452] Taken together, the provisions indicate that it may be the Legislature's policy to effectively allow the existing line of construction to serve as the line up to which others are allowed to build.

i. Close the gap

The so called "close-the-gap" provision in statute states that DEP may issue permits for armoring if the application is to armor an existing gap of less than 250 feet of shoreline in between existing armoring.[453]

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[448] Florida Coastal Management Program, Final Assessment and Strategies: FY 2006-2010, page 38.

[449] *See id.*

[450] FLA. STAT. §161.053(5)(b) (2007). This provision only pertains to applications for major habitable structures but does not affect armoring permits.

[451] *See, e.g.* FLA. ADMIN. CODE r. 62B-33.005(9) ("If in the immediate area a number of existing major structures have established a reasonably continuous and uniform construction line and if the existing structures have not been unduly affected by erosion, except [where the 30-year erosion projection applies], the Department **shall** issue a permit for the construction of a similar structure up to that line." (emphasis added)). *Also cf, e.g.* DEP Permit # ST-1653.

[452] FLA. STAT. §161.053(2)(b)1.b. (2007).

[453] FLA. STAT. §161.085(2)(c) (2007).

The "close-the-gap" provision is very important for various reasons. First, since armoring accelerates erosion, parcels located in between armoring structures are subject to greater erosive forces than if the armoring to each side did not exist. Second, the provision also appears to profoundly affect sea turtle nesting in the short term. Evidence indicates that the small, isolated beaches found in between existing armoring structures support a disproportionately large share of sea turtle nesting in heavily armored areas. Third, gap closing promotes increased investment that works against efforts to allow dynamic movement of the beach-dune system over the long term. It does this by allowing construction of major habitable structures closer to the beach than they otherwise might be constructed since the structures may be built behind the armoring that is constructed to close the gap.

The gap closure provision applies even when the sea walls creating the gap have no permits.[454] This raises the possibility that a gap might be the result of illegal armoring. Absence of a permit for existing armoring does not indicate that armoring is illegal as the armoring may predate Florida's permitting program for armoring, but this is unclear since there is no method to assure that existing sea walls were legally constructed. Permitting officials expressed little concern about this today as they believe that the large number of sea turtle advocates that now watch Florida beaches serve as an effective source of information for capturing current illegal construction activities. Nonetheless, permit applications are pending under the close-the-gap provisions where the armoring that helps create the gaps has applied for, but not received, a permit for the armoring. In most of these cases, the applicant has waived their right to a timely permit decision while waiting to see if the neighboring armoring will receive permits.

j. Protection of Public Access

Statutes dictate that construction of structures which limit public access shall be limited.[455] According to BBCS officials, protection of public access only looks to the immediate impacts of construction on public access, not to future impacts on public access. Continued and increased sea-level rise (SLR) and limitations on nourishment may combine to destroy public access in the future due to permits being issued today. In addition to this failure to comply with the statutory requirement of limiting structures which limit public access, state permitting activities which lead to the long-term destruction of Florida's beaches arguably violate the State's public trust doctrine fiduciary duty to preserve the beach for the citizens of the state.

k. 30-yr. EPL

In 1985 Florida's Legislature again added a definitive setback into the CCCL permitting program. The 30-year erosion projection (30-yr. EPL) is intended to prevent issuance of permits for non-shore-protection structures "proposed for a location which, based on . . . projections of

[454] As an example of a close-the-gap permit issued where the adjacent sea walls had no permits, see DEP Permit # PB-880 AR, memo from Perry Ponder.

[455] FLA. STAT. § 161.053(5)(e) (2007).

erosion in the area, will be seaward of the seasonal high-water line within 30 years."[456] The 30-yr. EPL may not include any areas landward of the CCCL,[457] is based on historic shoreline change,[458] and must consider existing beach nourishment projects or those projects for which funding has been secured and permits have issued.[459]

Research into the 30-yr. EPL has been hampered by a lack of organized information on the 30-yr. EPL. The BBCS database does not allow for any searches related specifically to the 30-year erosion control line. The only method researchers have to gather information on the 30-year erosion control line is to contact BBCS and to use a random sample of permits. Statutes require that DEP annually report to the Legislature on the status of the 30-yr. EPL,[460] but for over twenty years no such report has ever been written or submitted to the Legislature pursuant to this requirement.

l. Rebuild

Statutes specifically address the rebuilding of existing structures.[461] Rebuilt structures receive blanket exemptions from whatever limitations the 30-year erosion projection may have imposed on the location of a structure.[462]

2. CCCL Provisions to Protect Sea Turtles

The Beach and Shore Preservation Act contains several provisions intended to protect marine turtles by limiting construction, reconstruction, and other physical activities. Statutes limit the exemption from certain siting and design requirements for structures behind existing armoring to

[456] FLA. STAT. § 161.053(6)(b) (2007).

[457] *Id.*

[458] FLA. ADMIN. CODE r. 62B-33.024(2)(a)1.

[459] FLA. STAT. § 161.053(6)(d) (2007).

[460] *Id.* at § 161.053(6)(e) (2007).

[461] *Id.* at § 161.053(13) (2007). This section provides that:

> Notwithstanding the coastal construction control requirements defined in subsection (1) or the [30-year] erosion projection determined pursuant to subsection (6), the department may, at its discretion, issue a permit for the repair or rebuilding within the confines of the original foundation of a major structure pursuant to the provisions of subsection (5). Alternatively, the department may also, at its discretion, issue a permit for a more landward relocation or rebuilding of a damaged or existing structure if such relocation or rebuilding would not cause further harm to the beach-dune system, and if, in the case of rebuilding, such rebuilding complies with the provisions of subsection (5), and otherwise complies with the provisions of this subsection.

[462] *Id.*

those structures that are "[s]ited and designed to protect marine turtles."[463] This siting element of this restriction seems almost pointless, however, since the existing armoring itself usually poses a far greater threat to sea turtle nesting habitat than the structure behind the armoring.

When the DEP grants a permit for alteration, excavation, or construction on property seaward of established CCCLs, statutes provide that DEP "may condition the nature, timing, and sequence of construction of permitted activities to provide protection to nesting sea turtles and hatchlings and their habitat."[464]

DEP may grant "areawide permits"[465] for certain activities so long as the permitted activities, due to the type, size, or temporary nature of the activity, *will not cause measurable interference with marine turtles or their nesting sites*.[466] Similarly, DEP may grant "general permits" for projects, so long as the projects, due to the type, size, or temporary nature of the project, will not cause a measurable interference with marine turtles or their nesting sites.[467]

A section incorporating certain provisions[468] of the Beach and Shore Preservation Act into the Florida Building Code notes that such incorporation "does not limit or abrogate the right and authority of the [D]epartment [of Environmental Protection] to…adopt and enforce environmental standards, including but not limited to, standards for ensuring the protection of…marine turtles…"[469]

Development agreements authorized by the CCCL program must "further the conservation, preservation, and protection of the beach-dune system and cause no measurable interference with marine turtles or their nesting sites."[470]

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[463] *Id.* at § 161.053(2)(b)1.a (2007).

[464] *Id.* at §161.053(5)(c) (2007). DEP has interpreted this subsection's "nature, timing, and sequence" to *not* give DEP the authority to regulate *location* of proposed structures to provide protection to nesting sea turtles and their hatchlings.

[465] Florida Statute section 161.053(18) allows areawide permits to be granted "to local governments, other governmental agencies, and utility companies for special classes of activities in areas under their general jurisdiction or responsibility…" The special classes of activities include: road repairs, not including new construction; utility repairs and replacements, or other minor activities necessary to provide utility services; beach cleaning; and emergency response.

[466] FLA. STAT. §161.053(18) (2007) (emphasis added).

[467] *Id.* at §161.053(19) (2007) (allowing general permits to be granted "for projects, including dune walkovers, decks, fences, landscaping, sidewalks, driveways, pool resurfacing, minor pool repairs, and other nonhabitable structures…").

[468] The provisions incorporated are those "which pertain to and govern the design, construction, erection, alteration, modification, repair, and demolition of public and private buildings, structures, and facilities…"

[469] FLA. STAT. §161.053(22) (2007). An identical provision exists at §161.052(12). Both of these provisions were added by Chapter 2000-141, Laws of Florida, and made effective in 2002.

[470] *Id.* at §161.0531 (2007).

When constructing emergency rigid armoring pursuant to §161.085(3), protection of nesting marine turtles and their hatchlings should be "considered and incorporated into such emergency measures."[471] In addition, when using geotextile containers in dune reconstruction, there must be "reasonable assurance that adequate sand cover will be maintained over the structure such that the structure will not…adversely affect marine turtle nesting."[472]

DEP's charge to "develop and maintain a comprehensive long-term management plan for the restoration and maintenance of the state's critically eroded beaches" also requires that the plan "[i]dentify beach areas used by marine turtles and develop strategies for protection of the turtles and their nests and nesting locations."[473] In addition, statute required DEP to "adopt by rule a designation of coastal areas which are utilized, or are likely to be utilized, by sea turtles for nesting"[474] and to "adopt by rule guidelines for local government regulations that control beachfront lighting to protect hatching sea turtles."[475]

DEP does sometimes turn down permits based on the impacts to sea turtles and their nesting habitat.[476]

3. Trends in CCCL Permitting

[471] *Id.* at §161.085 (2007).

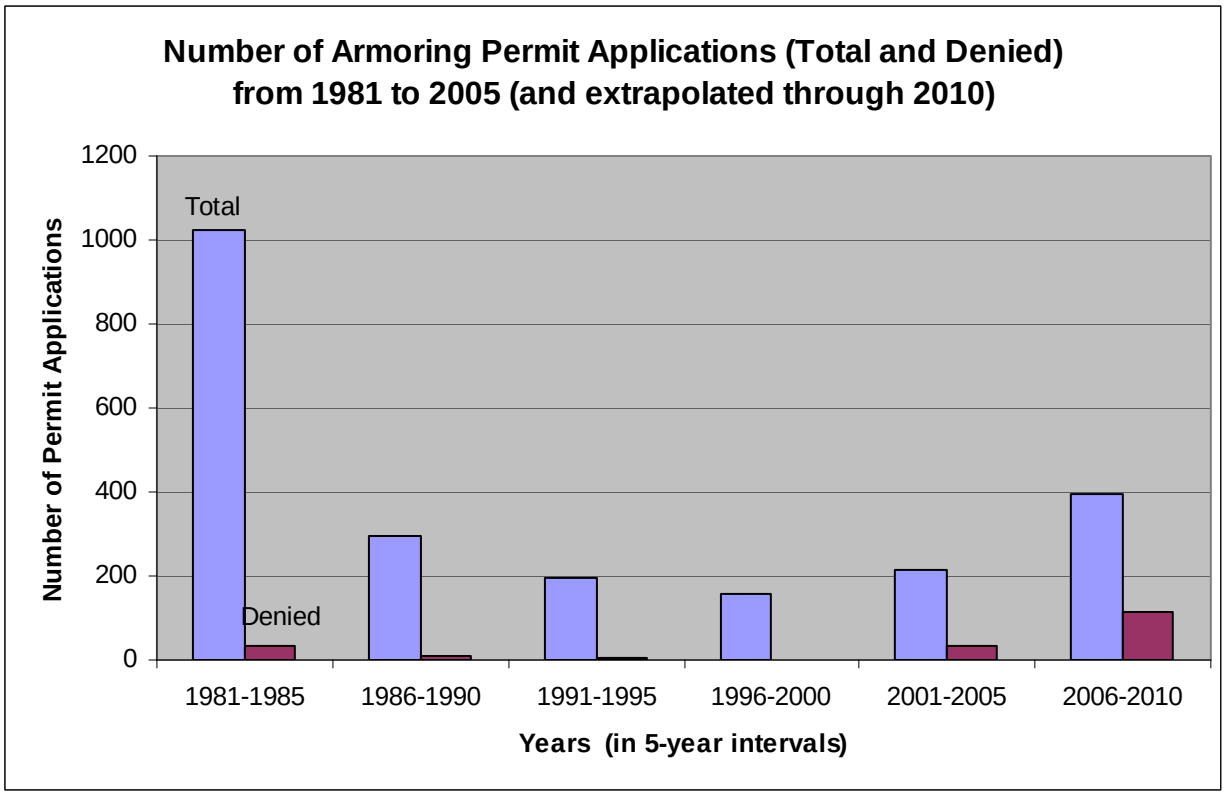
[472] *Id.* at §161.085(9) (2007).

[473] *Id.* at §161.161(1)(i) (2007).

[474] *Id.* at §161.163 (2007). DEP adopted a rule noting that sea turtles can use all beaches in the state for nesting, but the rule specifically listed 26 counties on Florida's coasts. FLA. ADMIN. CODE r. 62B-55.003.

[475] *Id.* In response, DEP adopted Florida Administrative Code rules 62B-55.004-.008.

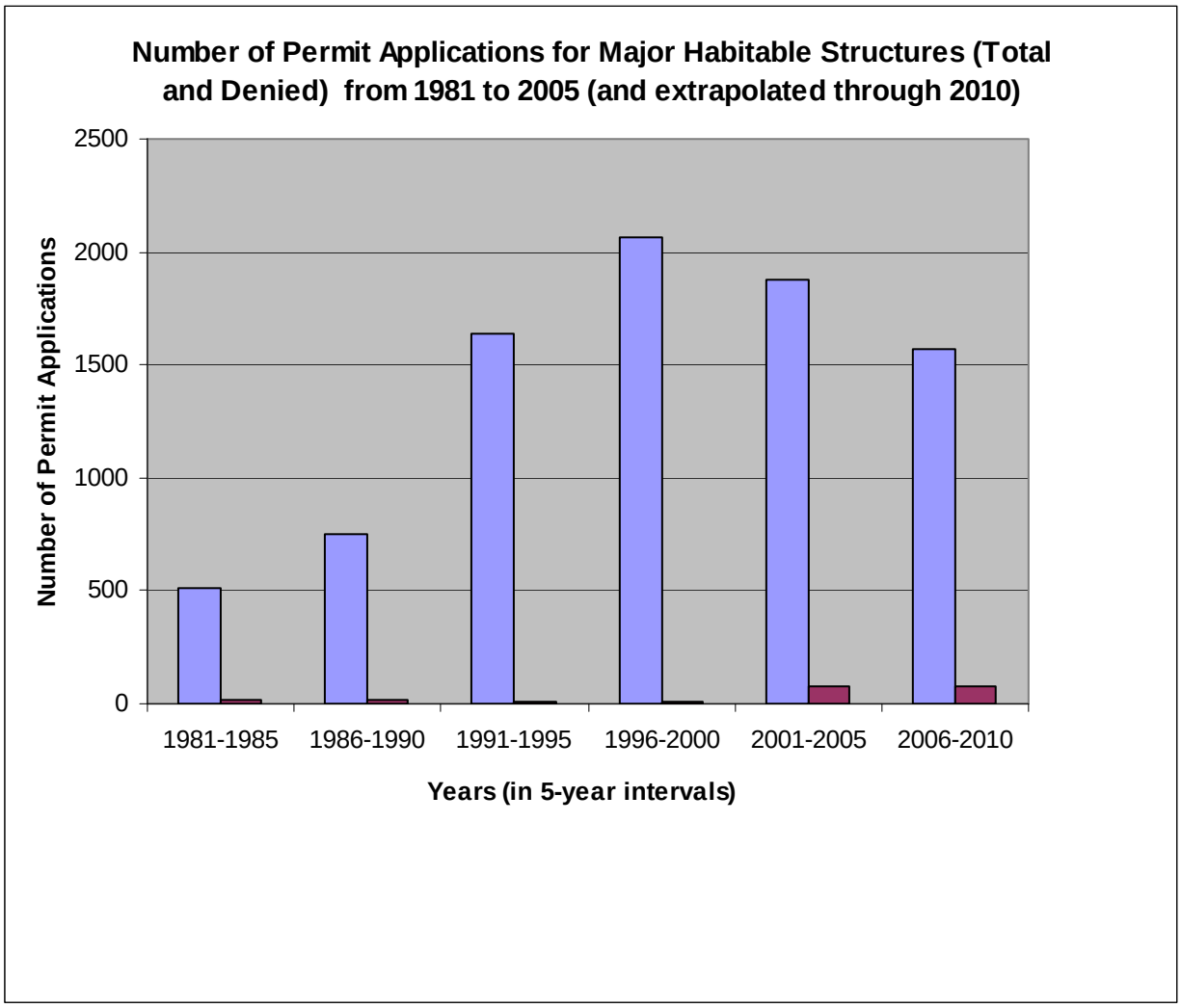
[476] *See, e.g.* DEP Final Order for DEP permit application FR 816 AR ATF. In addition, DEP has denied applications to make permanent a number of emergency armoring structures permitted by the Walton County Board of County Commissioners. Most of these denials have been challenged and remain in the administrative law system.



The permitting of armoring structures along Florida beaches declined dramatically after 1985. Much of the decrease is likely due to the new emphasis on beach nourishment coupled with changes to the permitting criteria. An increase in permit applications that began in the 2001-2005 period and continued into 2006-2007 will lead to almost a doubling of issued permits if the trend continues through 2010. A large part of this increase in permit applications and denials stems from the very active 2004 and 2005 hurricane seasons and much of the activity is centered in Walton County in Florida's panhandle.[477] The situation in Walton County, Florida receives further consideration below in the context of emergency permitting of armoring.

Even as the total number of armoring permits around the state has decreased, the average length of armoring requested in each permit application has increased. During the period of 1981 to 1985, the average length of new armoring granted per issued permit was 176.1 feet. During the initial twenty-one months of the 2006-2010 time period, the average length of new armoring granted per permit issued was 269.2 feet—which represents a 53% increase in the average length of new armoring per permit.

[477] This research used final orders of Florida's Department of Environmental Protection as its source of information. Two factors contribute to armoring constructed in response to 2004 and 2005 hurricane seasons being included in the 2006-2010 timeframe. First, those that armored under local government permits issued in response to emergency conditions in 2004 and 2005 have a window during which to file for state permits. Second, final orders in response to a permit application sometimes issue long after the permit application was filed.



The trend for permits for major habitable dwellings is virtually the inverse of the pattern for armoring. Permits consistently and dramatically increased from 1981 to 2000. From 2001 to the present they have been decreasing. The reasons for the increase and decrease are not clear. Current state regulations prohibit the issuance of armoring permits for major habitable structures permitted after 1985.

E. *Problems with the CCCL Program*

Some problems with the CCCL have already been addressed above in the context of specific provisions of the CCCL permitting program. This subsection looks at additional problems within the CCCL program.

1. Exception for Building Landward of Existing Armoring

The provision in statute allowing for construction landward of existing armoring should be modified or eliminated. The exception may have made more sense before realization of the potential impacts of SLR, but now that we clearly understand that SLR is occurring and is expected to *dramatically* increase in speed and magnitude, the current exception to criteria for construction of major habitable structures landward of existing armoring makes no sense since it promotes development behind a structure that will not be capable of continuing to offer the level of protection required by the exception. In addition, the increase in investment in coastal development contributes to increased difficulty in relocating development to preserve a dynamic beach.

The exception should be abolished and construction behind existing armoring should be subject to all criteria for any other development.

2. Rebuild

Policy on rebuilding of storm-damaged or simply old, out-dated structures has tremendous impact on the feasibility of allowing more economically-rational and measured movement back from dynamic beaches. Rebuilding of structures not only increases development investment in at-risk areas but also undermines the concept that buildings might be allowed in an area based on assumptions about the typical lifespan of the type of building being constructed.

Current Florida statutes provide that DEP may issue permits to rebuild a structure "within the confines of the original foundation"[478] or may permit "a more landward relocation or rebuilding of a damaged or existing structure if such relocation or rebuilding would not cause further harm to the beach-dune system. . . ."[479] DEP may not issue permits for "repairs or rebuilding that expand the capacity of the original structure seaward of the 30-year erosion projection."[480] In addition, when "reviewing applications for relocation or rebuilding, [DEP] shall specifically consider changes in shoreline conditions, the availability of other relocation or rebuilding options, and the design adequacy of the project sought to be rebuilt."[481]

To the average reader the rebuild provisions in statute appear to limit rebuilding to the confines of the original foundation of a structure, or, alternatively, to allow a rebuilding or repair of the existing building at a more landward location.[482] The ordinary observer might also think that such "repairing" or "rebuilding" would reflect the size and type of structure that was present before the need for "repairing" or "rebuilding." Such is not the case.[483]

[478] FLA. STAT. § 161.053(13)(a) (2007).

[479] *Id.*

[480] *Id.* at § 161.053(13)(b) (2007).

[481] *Id.* at § 161.053(13)(c) (2007).

[482] *Id.* at § 161.053(13)(a) (2007).

[483] The statute does contain language that explicitly states that no repair or rebuilding shall expand the capacity of the original structure if the original structure is landward of the 30-year erosion

In 2000, the Florida Legislature amended the Florida Building Code[484] to make it uniform across the state.[485] The legislation also modified the Beach and Shore Preservation Act to incorporate provisions on design and construction of structures into the Florida Building Code and gave authority to the Florida Building Commission to adopt rules to implement such provisions.[486] Prior to these changes, applicants for a CCCL permit needed to submit a form from a local building official that established that the "rebuild" was not "substantial."[487] After the effective date of the updated Florida Building Code—March 1, 2002—applicants no longer needed to supply a local government statement as to whether the proposed construction is a substantial improvement if the application is to repair, rebuild, improve, or add to an existing structure.[488] Thus, rebuilding is not limited to work that is not "substantial."

Removal of the "substantial" requirement for rebuilding has led to additional confusion, which is evident in the case of *Atlantis at Perdido Association, Inc., et al v. Bobby L. Warner, et al and State of Florida Department of Environmental Protection*.[489] In *Atlantis at Perdido,* the plaintiff applied for a "rebuild" permit to construct a fifteen-unit, nine-story condominium in place of an existing one-story quadriplex and one-story duplex. In addition to the new proposed project being substantially larger in surface area and square footage, it was also located more seaward and added a pool, concrete parking lot and other ancillary structures.[490] DEP justified granting of permit #ES-540 by arguing that the proposed project constituted a rebuilding of the existing structure, and thus held that it was not subject to CCCL requirements.[491] The administrative law judge rejected this argument and found that the proposed nine-story condominium, pool, deck, and parking lot constituted new development.[492]

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projection line. Given the shortcomings of the 30-year erosion projection, such a limitation is seldom applicable.

[484] Florida Statutes Chapter 553, Part IV, Florida Building Code (§§ 553.70-553.898) (2007).

[485] Laws of Florida, ch. 2000-141.

[486] FLA. STAT. § 161.053(22) (2007).

[487] FLA. ADMIN. CODE r. 62B-33.008(4). Florida Administrative Code rule 62B-33.002(50) defined "rebuilding" as "a substantial improvement of the existing structure as defined in 161.54, F.S." The long definition at section 161.54 includes more than just rebuilding, leading to an argument that the rule defining "rebuilding" is beyond the scope of the statute that includes rebuilding. In addition, the definition of "substantial improvement" excludes large parts of the actual costs of a substantial improvement as it excludes "nonstructural interior finishings. . . ."

[488] *See* DEP Form 73-100 (Updated 12/06), available at http://www.floridadep.org/beaches/data/forms.htm#CCCL_App_Form.

[489] Case No. 1D05-4069, 31 Fla. L. Weekly D1827c (July 6, 2006).

[490] DEP's Proposed Recommended Order at 4-5.

[491] *See* generally DEP's Proposed Recommended Order at 15.

[492] Case No. 1D05-4069, Benton, J. at 11.

The *Atlantis at Perdido* case arguably reached the correct outcome in rejecting DEP's interpretation of "rebuild." DEP's interpretation stood poised to allow almost any increase in size and density of existing coastal construction. While this would be a boon to coastal landowners in the short term, it would prove disastrous for efforts to adapt to SLR and protect dynamic beaches as sea turtle nesting habitat since every increase of density of coastal development creates that much more future loss, leading to ever greater political pressure by powerful coastal property owners to use the public's money—and coastal resources—for the protection of their private property. Thus, the first step in making rebuilding more rational is to establish that it cannot be used as a way to increase development and investment in areas already at danger from a moving beach.

The State of Florida should identify a zone (based on erosion rates and/or proximity to the MHW line or the landward toe of dune, when present) seaward of which rebuilding would simply be prohibited. If this policy is not implemented, a similar policy would be for the state and local governments to begin a project whereby they purchase the rebuild rights from properties.

Alternatively, the State of Florida could alter comprehensive planning statutes and regulations to require adoption by local governments of "post-disaster redevelopment plans" which could prohibit/restrict rebuilding in certain zones. Development of local post-disaster redevelopment plans constitutes a priority for Florida's Coastal Management Program.[493]

3. Administrative Problems

A fundamental problem in evaluating the effects of the CCCL program is the lack of clarity in the analysis that leads to permit decisions. Final agency action by FDEP usually consists of one long paragraph of boiler-plate language concluding that "the activities indicated in the project description of this permit are of such a nature that they will result in no significant adverse impacts to the beach/dune areas or to adjacent properties; that the work is not expected to adversely impact nesting sea turtles, their hatchlings, or their habitat; that the work is expendable in nature and/or is appropriately designed in accordance with Sections 62B-33.005, Florida Administrative Code; and that it is an activity or type of construction which the designee of the Chief of the Bureau of Beaches and Coastal Systems has authority to approve or deny."

Upon going to permit files to review the analysis that leads to such broad conclusions, one is met with a wildly-varying array of detail and clarity in what is contained in the permit.[494] In many

[493] *See, e.g.* U.S. DEPARTMENT OF COMMERCE, OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT, FINAL EVALUATION FINDINGS FLORIDA COASTAL MANAGEMENT PROGRAM JUNE 2004 THROUGH AUGUST 2007, pages 16-17, available at http://coastalmanagement.noaa.gov/mystate/docs/floridacmp2008.pdf.

[494] For example, DEP permit file FR 734 ATF CF M1 contains no "Analysis of Impacts" document. This document is supposed to form part of the official file per DEP procedures. Bureau of Beaches and Coastal Systems, Florida Department of Environmental Protection, Procedures Manual for Permit Managers 27 (Sept. 2006). As an example of a permit file with excellent information in the "impact analysis," see DEP file SL-215.

instances, permit files do not contain sufficient information to give an outside reviewer detailed information on the existing status of the site (or prior status of the site in the case of "after-the-fact" permits), the impact to existing vegetation, the history of use of the site for sea turtle nesting, and larger development context for the area. BBCS has some guidance for each of these,[495] and each invariably has some limited amount of information available in the permit file. However, actual documentation to create a traceable trail in the permit file of the specific evidence used to determine compliance of the application with all applicable statutory and regulatory criteria often is lacking. Application files that involve an analysis of vulnerability typically contain the figures and statistics from the computer model used to ascertain vulnerability. Files also contain extensive information about engineering for structures. The area with the least information, however, is about the impact to the beach dune system. In many permit files it is impossible to tell how the permit reviewer took into account different factors to conclude that the proposed activity would result in no significant adverse impact.

BBCS's standardized format for review of each permit application should require the reviewer to list the evidence (including pictures, diagrams, plant surveys, etc.) and include a copy in the official file that support a judgment as to each statutory and regulatory criterion assessed. This would increase the size of permit files and would also require more careful organization of information and materials. At the same time, such a process would allow reasonably intelligent, informed individuals to review a permit application file and understand the application, the context of the proposed site, and more or less how the final permit decision is reached. The current process is an opaque morass of scattered documents—few of which appear in permit files—which often leave a person reviewing the permit file with far more questions than answers about the project and how permit decisions were reached.

4. The "Line of Construction" Provision[496]

Establishing the "line of construction" is a murky business.[497] Written guidance on the line of construction simply refers to statutory and regulatory descriptions.[498] Conversations with those familiar with the CCCL program indicate that it may be applied differently in different cases. Conversations with various officials involved in permitting indicate that usually one structure on either side of the applicant lot would likely be sufficient to establish a line of construction, and there is some indication that structures farther away and not in line with adjacent structures

[495] *See*, *e.g.* BUREAU OF BEACHES AND COASTAL SYSTEMS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, PROCEDURES MANUAL FOR PERMIT MANAGERS (Sept. 2006).

[496] FLA. STAT. §161.053(5)(b) (2007)

[497] One memo in BBCS files about a dispute over the line of construction emphasized that the line is a very subjective one. Memorandum to Gene Chalecki from Ken Erlick & Tom Tomasello, dated April 2, 2007, permit file ST-1653.

[498] This guidance appears at pages 29-30 of the BUREAU OF BEACHES AND COASTAL SYSTEMS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, PROCEDURES MANUAL FOR PERMIT MANAGERS (Sept. 2006).

might be used to establish a "line of construction." Thus, uncertainties cloud how a "reasonably continuous and uniform line of construction" is determined and questionable application may effectively be advancing the line of construction seawards and more immediately into the path of harm and beach migration.

The statute limits application of the line-of-construction provision to cases in which "the existing structures have not been unduly affected by erosion."[499] No standardized definition of "unduly affected by erosion" exists;[500] conversations with various permitting officials resulted in conflicting opinions. One official maintained that the presence of armoring protecting adjacent structures indicated that they had been unduly affected by erosion or they would not have needed armoring. Another official opined that armoring, because it protects the adjacent structures, would mean that they were not unduly affected by erosion. This official would look at whether the proposed structure would be landward of the 30-year erosion projection line and see if the adjacent structures had received permits under the CCCL program. The most seaward buildings on a developed beach nourished by state funds should be assumed to be unduly affected by erosion since a beach must be classified as "critically eroding" to receive state funds. The only case in which this would not be true is when critically-eroding status of the beach and the state-funded nourishment were based on threats to recreation, wildlife habitat, or important cultural resources that did not include buildings establishing the line of construction.[501]

Furthermore, the line-of-construction provision states that "This paragraph does not prohibit [DEP] from requiring structures to meet design and siting criteria established in paragraph (a) or subsection (1) or subsection (2)."[502] Research in permits, conversations with those inside and outside of DEP, and a draft analysis of the CCCL program all indicate that the line of construction can be the determining factor in siting decisions.

Application of the line-of-construction provision in statute may effectively advance the line in construction in some cases. Furthermore, allowing construction up to the existing line of construction promotes increased investment and proportionally greater difficulty in adjusting to future movements of the beach-dune system. Building to the line of construction may be the difference in changing an area from one where policies of moving back from the migrating shoreline would be adopted to one where the beach will be entirely lost along with its habitat, ecosystem, and all the recreational, esthetic, and spiritual benefits it provides us.[503]

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[499] FLA. STAT. §161.053(5)(b) (2007).

[500] DEP's guidance manual for permit managers does not address this issue when discussing the line of construction. BUREAU OF BEACHES AND COASTAL SYSTEMS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, PROCEDURES MANUAL FOR PERMIT MANAGERS 29 (Sept. 2006).

[501] *Cf., e.g.* FLA. ADMIN. CODE r. 62B-36.003; 62B-36.006(1)(a)&(b).

[502] FLA. STAT. §161.053(5)(b) (2007).

[503] This has already happened in some areas. For example, Male, the capital island of the Maldives, had its beach eliminated entirely by a $60 million armoring project. *See* Maldives Builds Barriers to Global Warming, National Public Radio, available at http://www.npr.org/templates/story/story.php?storyId=18425626.

Application of the line-of-construction provision should be eliminated or at least limited in application to those areas that are most densely developed and already likely to be protected in the short-term. However, even in such instances, development should be conditioned on recordation of deed restrictions limiting rebuilding of the property and requiring removal of any structures that interfere with the dynamic beach.

5. The 30-Year Erosion Projection Line

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The 30-yr. EPL is the only setback line in the CCCL program. Long-term evaluation and research on the efficacy of the 30-yr. EPL since its inception in 1985 does not seem to exist. In part this lack of information is due to the failure of DEP to comply with the statutory requirement to submit a yearly report on the status of the 30-yr. EPL and any changes to the procedure for establishing it to the Legislature.[505] Even as a setback prohibition, it appears to fail to effectively protect the beach-dune system due to a number of inherent deficiencies. Some of these deficiencies are considered here.

First, the planning horizon for the 30-yr. EPL is flawed. The line is only estimated for 30 years worth of erosion. Since most buildings last much longer than 30 years (with some infrastructure assumed to last up 100 years in planning documents), it unclear why the Legislature chose this number to serve as a measurement of a safe distance from the shoreline.

[504] Picture from http://www.beachbrowser.com/Archives/Environment/June-2000/How-to-Save-Wetlands-and-Beaches.htm.

[505] FLA. STAT. § 161.053(6)(e) (2007).

Second, the 30-yr. EPL requires putting a structure behind the line where the seasonal high water line (SHWL) will be in 30 years.[506] This fails to protect the dynamic dune structure of the beach-dune system since, even in the best-case scenario (i.e.—accurate assessments of average erosion, no major storms, no recession due to sea level rise), a structure built behind the 30-yr. EPL will be at the SHWL in 30 years, meaning that a structure built to the line will be forward of the primary dune, harming this critical portion of the beach-dune system. Dune systems provide sand storage for the coastal system, and failure to protect the long-term integrity of the dunes constitutes failure to protect the beach-dune system. The weakness of using the SHWL as a reference point is especially acute in the panhandle area of Florida where the beach profile and low SHWL leaves the SHWL so far out from the toe of the dune that even relatively high average annual erosion rates multiplied by 30 years would may still place the 30-yr. EPL at or seaward of the dune bluff.[507] Thus, the 30-yr. EPL serves no additional beach-dune protection service in such a situation. At best, the line means that in 30 years or less, the waves will be lapping at the pilings of a newly-permitted structure.

Third, the eight possible methods for calculating the 30-yr. EPL listed in Florida's administrative code[508] look only to "historical measurements."[509] Historical measurements do not effectively incorporate future changes due to sea level rise, creating a problem with the fundamental measuring stick of the 30-yr. EPL.[510] As sea levels rise, the shoreline migrates landward at a rate which is a function of the gradient of the local topography.[511] Estimates for this process, called shoreline recession, vary greatly for Florida and may also vary radically from place to place in Florida depending on local conditions. However, as a rule of thumb, scientific analyses appear to indicate that shorelines in Florida are subject to 500 to 1,000 feet of shoreline recession for each foot of sea level rise. The higher end of the most recent estimates of sea level rise from the Intergovernmental Panel on Climate Change, which are arguably quite conservative, amount to almost 2 feet of sea level rise from about 1990 to 2095.[512] Thus, 2 feet of sea level rise would

[506] The seasonal high water line is "the line formed by the intersection of the rising shore and the elevation of 150 percent of the local mean tidal range above local mean high water." FLA. STAT. § 161.053(6)(a)2 (2007).

[507] For information on the SHWL in various parts of Florida, see Tidal Datums and Ranges for Open Coast Gauges of Coastal Florida (March 31, 2004), available at http://www.dep.state.fl.us/beaches/publications/pdf/tidal.pdf.

[508] FLA. ADMIN. CODE r. 62b-33.024(2)(a) through (h).

[509] FLA. ADMIN. CODE r. 62b-33.024(1).

[510] A paper originally published in 1992 concluded that historical sea-level rise up to that point had been entirely masked by daily tides, storms, and the longshore movement of sand. Emmett R. Foster, Thirty Year Erosion Projections in Florida: Project Overview and Status, p. 16, available at ftp://ftp.dep.state.fl.us/pub/water/beaches/HSSD/reports/overview.pdf.

[511] Information on shoreline recession here is taken from ROBERT E. DEYLE, KATHERINE C. BAILEY, AND ANTHONY MATHENY, ADAPTIVE RESPONSE PLANNING TO SEA LEVEL RISE IN FLORIDA AND IMPLICATIONS FOR COMPREHENSIVE AND PUBLIC-FACILITIES PLANNING 9-11 (September 1, 2007).

[512] *Supra* Part I.C.

result in approximately 1,000 to 2,000 feet, or almost 2/10 of a mile to more than 1/3 of a mile of beach recession if beaches are allowed to move naturally. Even breaking this down into 30 year periods for purposes of the 30-yr. EPL would result in the 30-yr. EPL being located about 475 feet landward of the current MHWL after 30 years. Yet, under current methodologies, the BBCS may apply default erosion rates of 1 foot per year[513] or even less if nourishment is occurring.[514]

The calculations of the 30-yr. EPL in areas being nourished particularly deserve mention. The BBCS maintains very broad discretion in how nourishment gives credit to the 30-yr. EPL calculation.[515] In essence, nourishment allows the BBCS to move the 30-yr. EPL further seaward than it would otherwise be located.[516] BBCS officials currently give 50 years credit in the 30-yr. EPL calculation for existing federally-funded nourishment projects and existing state funded projects usually receive around 10-15 years credit in the calculation. An administrative law case held that "existing" projects include future nourishment projects only if "all funding arrangements have been made and all permits have been issued at the time the application is submitted."[517] Thus, "the potential for continued nourishments beyond the term of the 'existing' project is not appropriate for consideration under Rule 62B-33.024."[518]

Additionally, rules state if the pre-project erosion rate cannot be determined, the 30-yr. EPL shall be set along a "reasonably continuous and uniform line of construction that has shown to be not unduly affected by erosion."[519] The rules do not provide a definition of "unduly affected by erosion." One would assume the definition of "unduly affected" would include areas so affected by erosion that they are in need of nourishment. However, since no definition is provided, and since this definition of "unduly affected" would prevent use of this subsection, it is clear that this is not the accepted interpretation.

As another weakness, the role storm events play in determining "the average annual shoreline change rate"[520] has not been clearly determined. For example, no policy exists for how to incorporate into the 30-yr. EPL the fact that some areas may have lost dozens of feet of beaches during the 2004-05 hurricanes in Florida. Do such storm events qualify as "prevailing coastal processes acting on or likely to act on the site"?[521] If they are deemed not to be, they "shall not be used" in calculation of the 30-yr. EPL, which would mean that the "average" erosion rate

[513] FLA. ADMIN. CODE r. 62b-33.024(2)(a)3.

[514] *Id.* at 62b-33.024(2)(d).

[515] *Id.* at 62b-33.024(2)(d)2.

[516] *See, e.g.* DEP document "30-Year Erosion Recommendations for St. Lucie County" (original document date 1/26/05) (in DEP permit file SL-223)(deferring any calculation .

[517] *Beach Group Investments v. DEP*, 2007 WL 1182441 (Fla.Div.Admin.Hrgs. 2007).

[518] *Beach Group Investments v. DEP*, 2007 WL 1182441 (Fla.Div.Admin.Hrgs. 2007).

[519] FLA. ADMIN. CODE r.62B-33.024(2)(d)(4).

[520] *Id.* at 62b-33.024(2)(a).

[521] *Id.* at 62b-33.024(2)(a)1.

under the 30-yr. EPL would not include storms. In addition, the effect of storm events can make 30-yr. EPL estimates inaccurate.[522]

Finally, a significant exception to the 30-yr. EPL setback allows construction of a single-family home seaward of the 30-yr. EPL on certain parcels.[523] This exception likely owes its existence to the U.S. Supreme Court case of Lucas v. South Carolina Coastal Council.[524]

Thus, under current rules, the 30-yr. EPL fails to act as a significant setback that will protect the beach-dune system from imprudent construction well into the future and not even for the next 30 years in many cases. The rules for the 30-yr. EPL should be modified to account for a much longer time frame, such as 50-100 years, and take into account the crucial importance of protecting the dune structure by siting structures behind the line of the projected dune structure location instead of the seasonal high water line. The shoreline change rates should also account for sea level rise and should contain a "severe storm safety measure" on top of the average shoreline change rates to account for the inevitable hurricane or tropical storm. Finally, the 30-yr. EPL statute should not give any credit for nourishment projects on the beach. In other words, the 30-yr. EPL should be calculated from the mean high water mark *before* the nourishment takes place.[525] This would be more consistent with the policy of statute section 161.141, which states that any nourishment additions to upland property landward of the established line of mean high water "are not be used to justify increased density or relocation of the coastal construction control line as may be in effect for such upland property." Currently section 161.053(6) allows construction further seaward due to nourishment even though the reason the beach needs nourishment is that it is eroding so quickly.

As a tangible example of the failure of the 30-yr. EPL to protect the beach-dune system, public access, or sea turtle nesting habitat through proper siting, one can look at permits GU-355 and GU-450. Permit # GU-355 permitted a house *landward* of the 30-yr. EPL in 1992, but the house

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[522] For example, in 2000, a report stated that "The future for Walton County appears favorable in that no major shoreline orientation adjustments appear likely. . . ." Emmet Foster, *et al.*, Shore Change Rate Estimates, Walton County, April 2000, page 1, available at ftp://ftp.dep.state.fl.us/pub/water/beaches/HSSD/reports/walsre.pdf. This same report noted that "There are no obvious indications of major storms permanently changing the MHW shoreline erosion pattern in Walton County to date." *Id.* at p. 5. The report did, also, state that "the main concern from an erosion standpoint in this county is the fact that the primary bluff or dune face is vulnerable to recession during major storm events, threatening buildings that may be sited too close to the edge or with inadequate foundations." *Id.* at 14. This is what happened during 2004-2005 in Walton County.

[523] FLA. STAT. § 161.053(6)(c) (2007). To be eligible for this exemption, all the following criteria must be met: 1.) The parcel must have been platted or subdivided by metes and bounds prior to 1985; 2.) the owner of the parcel must not own another parcel which is adjacent and landward of the parcel where the proposed house would be located; 3.) the proposed house must be landward of the frontal dune; and 4.) the structure will be as far landward as practicable.

[524] Lucas v. South Carolina Coastal Council, 505 U.S. 1003 (1992).

[525] This line is known as the erosion control line. FLA. STAT. § 161.151(3) (2007).

already suffered damage from erosion below the structure during the 2004-2005 hurricanes season, leading to need to repair the septic tank and service connections to the structure. The owner also constructed illegal armoring to protect the repairs and the parking slab.

6. Outdated CCCLs

CCCLs must remain current to give the maximum amount of protection they are capable of giving. As noted above in Part III.D.1.a-d, the process for establishing them is so arduous and takes so much time and no statutory or regulatory schedule requires their reestablishment. Thus, many erosion control lines are outdated, with the oldest being twenty seven years old.[526] While some beach areas experience little erosion or actual accretion, erosion rates of up to twenty feet per year in some areas mean that such CCCLs may be of little use in protecting the beach-dune system.

7. Definitions of Eligibility

Current regulations will only allow an armoring permit for a structure vulnerable to erosion if the structure is "eligible," meaning that it was ***not*** constructed pursuant to a CCCL permit after March 1985. As erosion rates in some areas push the beach ever closer to the CCCL, buildings constructed ***behind*** the CCCL become threatened by erosion.[527] Since such structures were built without a CCCL permit, they qualify as "eligible" structures. Assuming a scenario in which SLR leads to increased recession rates, the problem of relatively new structures begin armored looms large.

File # FR-878 AR ATF serves as an example of what the future holds under current CCCL eligibility requirements. The building was built *without* a CCCL permit in 1985 because it was behind the CCCL that had been established in Walton County in 1982. Thus, though the structure was built in 1985,[528] it is "eligible" for armoring.[529]

Picture of building at issue in file # FR-878 AR ATF:

[526] *See supra*, table in Part III.D.1.d.

[527] For example, the

[528] Information from a real estate listing on the internet. The ad also states that "Beach restoration and additional white sand have been installed beach front to Palms of Dune Allen"

[529] Permit # FR-878 AR ATF was denied by DEP on multiple grounds, including non-vulnerability of the structure according to DEP rules, "take" of sea-turtles through habitat modification, and failure of the armoring to comply with design standards in rule.

In addition to the problems associated with the definition of "eligibility," more and more applications for armoring are beginning to seek variances to the definition of eligibility.[530] Allowing variances to the need for eligibility would mean that the CCCL program serves little protective function to the beach-dune system as it first allows poor siting and then allows the landowner to armor to make up for the poor siting too close to the water. In addition, allowing armoring as a result of a variance to the definition of "eligible" will further promote the belief of property owners that the risk of erosion to coastal property must be borne by the public and the coastal system via a loss of public beach rather than by the coastal property owner via loss of the coastal property. Yet precisely this attitude must change as a part of better coastal management.

8. Waiver of Permit Deadlines

A "waived" permit is one in which the applicant has waived the applicant's right to have BBCS make a decision on the permit within the statutory timeframe of 90 days from the date the permit is deemed complete. Since the application is already complete, waiver is not a way for the applicant to have more time. An applicant will often do this if BBCS has indicated it may deny the permit. The waiver gives the applicant time to amend the application, wait for changed circumstances, or take some action to encourage issuance of the permit. DEP in some instances recommends that staff initiate the waiver process with applicants.[531]

In some cases waivers serve as mechanisms that allow a permit to remain pending and ultimately receive approval rather than being rejected. For example, in one case several permit applications to construct single-family homes were going to be denied because the homes would fall seaward of the 30-year erosion projection line but did not meet the criteria for the exceptions to this setback. The permit applicants waived the permit deadlines and supported a beach nourishment project in the area. After the nourishment project, DEP issued permits for the single-family homes.

[530] Variances more generally are discussed *infra* at Part III.E.10.

[531] BUREAU OF BEACHES AND COASTAL SYSTEMS, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, PROCEDURES MANUAL FOR PERMIT MANAGERS 25-26 (Sept. 2006).

As of August 15, 2007, there were seventy-eight waived permits. Forty-two appeared to be indefinite waivers with twenty-six of these in Walton County and all but six being ATF permits.[532]

9. Lack of Clarity and Political Problems

Review of permit files demonstrated a lack of clarity in how permit applications are assessed. This lack of clarity is due in large part to the vagueness of the statutory and regulatory criteria implementing the CCCL program. For instance, CCCL permits only issue if the proposed activity will not result in a "significant adverse impact,"[533] which is defined as impacts that cause a "take" or that alter the coastal system by measurably affecting the existing shoreline change rate, significantly interfering with its ability to recover from a coastal storm, or disturbing topography or vegetation such that the dune system becomes unstable or suffers catastrophic failure or the protective value of the dune system is significantly lowered.[534] However, there is little other guidance on how to measure whether the impact of a permit rises to the level of significant adverse impact.[535] The inclusion of many different factors which lack measurable criteria creates a situation in which BBCS permit reviewers compile and review data, but the ultimate decision on whether the impacts would be significantly adverse occurs through an unknown calculus in the head of the permit reviewer that purportedly takes into account all the information assessed. This extensive exercise of judgment with little measureable external criteria reflected in permit files creates a level of vagueness and lack of transparency that creates ample space for the possibility of political considerations to enter into the permit approval process.

Coastal property in Florida carries tremendous value.[536] High property values and the wealth of many coastal property owners often translate into political connections for those interested in building along Florida's coast. Such political clout can translate into the ability of some to get permits. During research, numerous individuals familiar with the CCCL program asserted that

[532] For example, one of the non-ATF waivers is file # CH-531 AR. This is a permit to fill the gap between existing armoring. DEP analysis indicates that adjacent armoring is exacerbating erosion, but the Florida Fish and Wildlife Conservation Commission concluded that the armoring would cause a "take" of sea turtles due to destruction of nesting habitat. The permit has been waived multiple times, with the most recent waiver effective until October 31, 2008.

[533] FLA. ADMIN. CODE r. 62B-33.005(3)(a).

[534] *Id.* at 62B-33.002(32)(b).

[535] A recent draft evaluation of the CCCL program also noted the difficulty of applying the "significant adverse impact" standard. Coastal Technology Corp, CCCL Program Evaluation- Report No. 1: Findings Regarding Current Florida Coastal Construction Control Line Policies, Rules and Statutes, pp. 9-13 (report in partial fulfillment of FDEP Contract No. BS015).

[536] Coastal property in Florida is estimated to be worth about $1 trillion. FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS, COASTAL HIGH HAZARD STUDY COMMITTEE FINAL REPORT 9 (Feb. 2006).

enough political pressure will usually result in the issuance of a permit. DEP's internal procedures automatically send applications up the chain of command to the Bureau Chief for consideration if DEP receives communications from the Office of Legislative Affairs of other policy makers inside or outside DEP.[537] Thus, those individuals with the ability to get their legislators to call DEP will bypass ordinary staff review of their permit application.

The lack of clarity in how factors are weighed in making permit decisions may contribute significantly to the vulnerability of the permitting process to political influence. CCCL statutes and rules require modification to clarify the standards and criteria and how they interact to result in a determination of "no significant adverse impact." Modifications could include development of a matrix of different factors to consider for each permit. Each factor would be weighted and rated according to defined formulas with a minimum overall score necessary for issuance.[538] There is also the possibility of setting a lowest possible score on one or more factors. A possible model for such development is the creation of Florida's Uniform Mitigation and Assessment Methodology for wetlands.

10. Variances

The BBCS database of permits cannot search exclusively for variances, but since the addition of a "variance" checkbox to BBCS's internal "permit routing" document, permit numbers have been amended with a "V."[539] A search of all permit numbers with a "V" permitted researchers to discover nine permit files titled "variance" as of late 2007.[540]

Two statutes allow variances to the limitations on coastal construction in Chapter 161. The first of these specifically allows a variance to the 50-foot setback requirement of section 161.052.[541] The other variance, which is of more concern here, is the general statutory language allowing agencies to grant variances to their rules.[542] This second variance relies on the authority of state

[537] Bureau of Beaches and Coastal Systems, Florida Department of Environmental Protection, Procedures Manual for Permit Managers 16 (Sept. 2006).

[538] This could be modeled after the ranking system for beach management funding in the current Florida Administrative Code. *See* FLA. ADMIN. CODE r. 62B-36.006.

[539] Within the last year, BBCS's internal "permit routing" document was modified to add a variance checkbox that distinguishes between the "variance" defined by statute as part of § 161.052(2) and a variance under § 120.542.

[540] The permits were IR 522 V; LE 887 V; PB 787 AR V; OK 327 V; WL 822AR V (file has been listed as inactive and incomplete, thus "undetermined"); WL 831AR V (application complete yet indefinitely waived by bureau chief); WL 868AR V (application complete yet indefinitely waived by bureau chief); WL 872AR V (application complete yet indefinitely waived by bureau chief); and WL 883AR V. These results had to be separated from permits of Volusia County and Brevard County as the permit code for each of these also contains the letter "v."

[541] FLA. STAT. § 161.052 (2007) (allowing for variances to the fifty-foot setback line under certain circumstances).

[542] FLA. STAT. § 120.542 (2007).

agencies to grant variances to their regulations when the purpose of the statute will be or has been achieved by other means and literal application of the rules would cause substantial hardship or would affect a particular person in a manner significantly different from the way the rule affects other similarly situated persons subject to the rule.[543]

Permit application WL 883 AR V gives an example of a variance request. The property owner was originally denied an after-the-fact permit for armoring constructed pursuant to a local government emergency armoring permit. The permit was denied for four reasons. The structure was not deemed "eligible" for armoring[544] the structure was not considered vulnerable; the sea wall was not located as far landward as practicable; and construction of the sea wall constituted a "take" of marine sea turtles. The application sought a variance to the "eligibility" criterion of rule and to argue that the structure is "vulnerable."[545]

Under cited law, the variance could be granted upon a showing of hardship and that the purpose of the statute has been met. The variance petition argued that continued erosion without the sea wall would cause hardship because future erosion could:

- sever utilities to the structure, requiring expensive repairs,
- destroy air conditioning units
- destroy landscaping and a hot tub
- cause loss of use of the structure during repairs occasioned by erosion
- cause loss of part of the parcel

Further losses contributing to hardship claimed by the applicant included a substantial cost for removal of the armoring and loss of the investment in installation of the armoring.[546] The applicant estimated that the total economic hardship due to these factors could rise to almost $2.6 million. The applicant also asserted a "technological" hardship since removal of the unpermitted sea wall would make it difficult to retain sand under the structure.

In addition, the variance requires that the purpose of the statute be met. The applicant emphasized that one purpose of the statute is to allow for protection of private property and asserted that the sea wall does exactly this. The applicant then acknowledges the intent of other portions of relevant statute to protect the beach-dune system from imprudent construction, protection for native vegetation, and protection of public access. The petitioner asserted that the sea wall would protect the dunes behind it and that the sea wall did not affect native, salt-tolerant

[543] FLA. STAT. § 120.542 (2007).

[544] In the case of a house, the structure is eligible if it is "non-conforming." FLA. ADMIN. CODE r. 62B-33.0051(1)(a)1. A non-conforming structure is "any major habitable structure which was not constructed pursuant to a permit issued by the Department [of Environmental Protection] pursuant to Section 161.052 or 161.053, F.S., on or after March 17, 1985." FLA. ADMIN. CODE r. 62B-33.002(43).

[545] The petition states that a habitat conservation plan that is under development would alleviate the "take" problem and that the petitioners would meet with the agency to discuss the claim that the armoring was not cited as close as practicable to the structure.

[546] Petition for Variance or Waiver, FDEP file # WL-883 V.

vegetation. Thus, said the applicant, the sea wall accomplishes the statutory goal of protecting the beach-dune system.

As another example of a variance request, one can look to a variance application received May 1, 2008 by DEP for a house in St. Johns County.[547] A newspaper article describing the plight of the this and four other homeowners in St. Johns County stated that "U.S. Rep. John Mica, R-Fla., and St. Johns County officials announced Friday afternoon that five Vilano Beach homeowners can install permanent seawalls to stop their homes from toppling into the ocean."[548] However, St. Johns County officials may only issue "temporary" armoring permits, and DEP must issue the permanent permits. The appearance of a U.S. representative and assertions that the armoring will be "permanent" gives the appearance that politics might be at play in the permitting process since current DEP rules do not allow armoring for these houses.[549]

Granting of variance requests such as this one would erode the few fundamental protections for the beach-dune system incorporated into the CCCL program. The requirement that a structure cannot be armored unless it was not built pursuant to CCCL permit should serve as notice to property owners building on Florida's beaches since 1985 that the risk of erosion of their property resides with them and that the risk should not be borne by the public and ecosystem by loss of the natural beach.[550] Without this fundamental limitation, DEP would further guarantee the loss of our beaches to armoring every time it issued a permit for coastal construction. The prohibition on armoring for structures built pursuant to the program recognizes that such structures are built to ***not*** lock up the sand underneath them and interfere as little as possible with the beach-dune system. Currently the variance sought by WL 883 AR V is undetermined and waived indefinitely.

The push to grant evermore variances to protect property built after 1985 will only grow as more and more houses built with a CCCL permit are threatened by coastal erosion. DEP has continued to receive variance requests since the nine already received by late 2007 and those familiar with the CCCL program expect many more to be coming, mostly from Walton County.[551]

11. After-the-Fact Permitting

[547] DEP application SJ-1029 AR V.

[548] Christina Abel, Times-Union (electronic addition), Seawall waivers granted to 5 beach homeowners (April 12, 2008) available at http://www.jacksonville.com/tu-online/stories/041208/met_267694953.shtml.

[549] *Id.*

[550] In 2008 the Florida Legislature passed a bill that would create an exception to this. *See supra* notes 56 - 57 and accompanying text.

[551] For example, a letter to DEP requesting a variance for a home in Walton County stated that within the neighborhood concerned, "All [those that armored] are currently requesting variances . . ." Petition letter of Keith R. Jackson, DEP file #WL-999 AR V.

Instances arise when activities take place within the CCCL jurisdictional area without a permit from the state. The most common cause of this is the authority of local governments to issue "temporary" armoring permits to protect structures from erosion that occurred during a storm event.[552] In most cases, the party responsible for the permit will seek an "after-the-fact" permit (ATF). Many ATFs issue in response to armoring built pursuant to a local government's issuance of an emergency armoring permit.[553] In other cases, structures are built with no legal permit at all. Review of selected ATF permit files indicated that in some instances an applicant applies for a permit for a structure, builds the structure prior to receiving the permit, and DEP then converts the application to an ATF application.[554]

DEP has statutory authority to grant ATF permits in two instances. First, subsection 161.054(5), Florida Statutes provides that DEP shall deny a permit to an applicant whose property is subject to a lien due to an enforcement action, but that DEP may grant an after-the-fact permit once the violation is resolved. In addition, DEP has statutory authority for granting ATF permits as part of the regime allowing local governments to issue temporary armoring permits which then must apply for permanent permits.[555]

Walton County has been the current center of ATF permitting due to issuance of about 250 emergency "temporary" armoring permits by Walton County in response to severe coastal erosion in 2004 and 2005. In addition, some armoring was constructed without even a local government permit.[556] Most of these 250 have properly submitted permit applications to DEP to make their armoring permanent. Some ATFs have been granted and others denied. A denial of an ATF permit does not lead to an immediate order to remove the armoring. If the permit applicant challenges the denial of the permit, then during the legal process, the armoring is not considered a violation because it complied with the law to apply for a permit. On the other hand,

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[552] FLA. STAT. § 161.085(3) (2007). This authority has a history of causing problems in Florida. A number of sea walls permitted by Indian River County—prime sea-turtle-nesting habitat on Florida's east coast—precipitated creation of the Indian River habitat conservation plan. More recently, in reaction to coastal erosion due to hurricanes Ivan (2004) and Dennis (2005), Walton County in Florida's panhandle issued about 250 temporary permits for coastal armoring. Many of these have applied for after-the-fact permits from the state. Some of these applications have been granted, some are undetermined or in "waived" status, and others have been denied. Virtually all denials are currently being challenged.

[553] *See infra* Part III.F on emergency permitting.

[554] *See infra* notes 570-71 and accompanying text (discussing permit WL-878 AR ATF).

[555] FLA. STAT. § 161.085(3)-(8) (2007).

[556] These include: James E. Mountjoy- DEP violation #VWL 05-07/WL-844 AR ATF; Lee Shook- DEP violation #VWL 06-02/WL-888 AR ATF; John Higdon- DEP violation #VWL 06-03/WL-911 AR ATF; Tony & Linda Hill- DEP violation #VWL 06-04/WL-947 AR ATF; Silver Shells Townhomes- DEP violation #VWL 06-07/WL-887 AR ATF; Palms of Dune Allen- DEP violation #VWL 06-08/WL-878 AR ATF; Alan H. Nix- VWL 06-09/WL-928 AR ATF; Patrick Tylka- DEP violation #VWL 06-10/WL-928 AR ATF; James & Michelle Spires- DEP violation #VWL 06-11/WL-934 AR ATF; Stephen Chambers- DEP violation #VWL 06-19/WL-975 AR ATF; Ed Foy- DEP violation #VWL 06-21/WL-1002 AR ATF; Scott Bumpas- DEP violation #VWL 06-22/WL-970 AR ATF.

if the ATF application is denied and not challenged, the armoring is to be removed. Researchers were unable to verify that this has happened with any armoring in Walton County despite the passage of several years since installation of most of the "temporary" armoring. For example, permit #WL-841-AR ATF was denied Nov. 9, 2006, and the denial was not challenged. DEP sent a warning letter April 27, 2007 requiring removal of the armoring, but the wall has not been removed. As of April 2008, DEP had requested additional information and was in settlement talks; DEP officials did not disclose what settlement might include.

12. Enforcement Issues

Enforcement activities under the CCCL program include both compliance and violation activities. A compliance action results when a permit holder violates the permit whereas a violation occurs when a regulated activity takes place without a permit. DEP has seven to eight field agents around the state. Field agents conduct monthly inspections of permitted activities and fill out reports on these inspections. Field agents may discover compliance issues at the site of the permitted activity or discover violations at nearby sites, but DEP does not have anyone that regularly patrols the beaches to look for violations. DEP stated that most of the violations it deals with are brought to its attention by the public, often by disgruntled neighbors or sea turtle advocates monitoring beaches.

Statute and rule give significant authority to the Department of Environmental Protection to remove unauthorized construction and impose sanctions for unpermitted activities seaward of the CCCL. For example, unpermitted work is declared a public nuisance which is to be removed after notice.[557] If the owner does not remove, DEP may remedy the violation and place a lien on the property for DEP's cost in doing so.[558] Violations of permitting requirements can lead to criminal charges of a first degree misdemeanor.[559] In addition, statutes allow for administrative fines of up to $10,000 per day for violations.[560] Fines go into the Ecosystem Management and Restoration Trust Fund,[561] which also supplies funds for beach nourishment.[562]

Enforcement actions usually begin with a warning letter. The violator[563] is apprised of the relevant law and why DEP believes a violation has occurred. The violator will then typically

[557] FL. STAT. § 161.053(7) (2007). In addition, DEP may request that the Department of Legal Affairs institute proceedings to enjoin any regulated activity that does not have a proper permit. FL. STAT. § 161.081 (2007).

[558] *Id.*

[559] FL. STAT. § 161.053(8) (2007).

[560] *Id.* at § 161.054(1) (2007).

[561] FLA. ADMIN. CODE r. 62B-54.004(5).

[562] FL. STAT. § 161.091(1) (2007).

[563] "Violator" and "violation" from this point forward will refer to any person subject to an enforcement action, whether because of a compliance issue or failure to acquire a permit.

apply for an after-the-fact permit for the activity, apply for a modification to an existing permit, or otherwise remedy the violation. Application for an after-the-fact permit will halt the enforcement action assuming that the violating activity (or construction constituting the violation) is halted during the pendency of the permit application. If an after-the-fact permit is issued, the enforcement action is typically dropped.[564]

From January 1, 2006 to March 25, 2008, the total number of enforcement actions opened or closed by DEP was one hundred and seventy-three.[565] DEP seldom uses the great enforcement authority is possesses. For example, the current head of DEP's CCCL enforcement is not aware of a single instance in which DEP has used its authority to prosecute a CCCL violation as a criminal offense. DEP does sometimes use its authority to assess civil fines. From January 1, 2006 to March 25, 2008, DEP issued twenty-two fines for a total of $28,950.[566] Of this total, $27,700 had been collected. Fines ranged from $300 to $10,000, with the average being $1,315.91.

Arguably the most egregious cases of violations are those in which the situation demonstrates that the violator clearly new they were violating the law and intended to do so. For example, file # WL-878 AR ATF indicates that the applicant had applied for a geo-tube armoring structure. Before the permit review process was completed, DEP discovered that the applicant had installed an unauthorized armoring system different from the one in the pending application. The structure was ordered removed after denial, but even with such a willful, major violation, DEP did not recommend imposition of a fine since the "costs associated with removal of the [unpermitted armoring] will likely be significant."[567] If the unpermitted armoring by some settlement or litigation is allowed to remain, imposition of a fine would be reconsidered.[568] In most cases of illegal armoring, DEP takes this approach of assuming that the cost of removing the armoring is penalty enough.

This leads one to ask how often illegal armoring is removed. During research the rumor often surfaced that no armoring in the state had ever been removed despite many denials of after-the-fact permits over the years. Working with DEP officials, researchers proved that this is not entirely true. Research revealed three instances in which permit denial had an impact on existing armoring. In one instance, the owner of a structure that was not eligible for armoring[569] had

[564] For more information on "after-the-fact" permits, see Part III.E.11 above.

[565] This number does not include enforcement actions that may have been pending prior to the dates included but which had not been resolved during the dates stated.

[566] Beaches and Coastal Management System Fines Report, March 25, 2008 (on file with Thomas Ruppert).

[567] DEP Memorandum to VWL 06-08 from Jim Martinello, Environmental Manager, Bureau of Beaches and Coastal Systems.

[568] *Id.*

[569] The structure was not eligible because the house was built after 1985 with a permit under the CCCL program. *See supra* Part III.E.7 (describing eligibility requirements for armoring).

cement walls poured in between the piles supporting the house.[570] DEP discovered the violation and denied an application for an after-the-fact permit, and ordered removal. The owner of the house complied with the removal order. In another instance, a rock revetment was relocated landward due to an initial denial of a permit.[571] In the third instance, a sea wall was relocated landward.[572]

DEP has only one person in charge of CCCL enforcement for the entire state of Florida. This lack of staffing and resources may contribute to the small number of enforcement actions pursued and seen through to imposition of a civil fine.

As part of the review of enforcement activities, researchers conducted limited "groundtruthing" of certain permits in Martin, Palm Beach, St. Lucie and Walton counties.[573]

Martin County

In Martin County, five permits were slated for groundtruthing. Researchers were only able to visit two locations. One had armoring that was "undetermined" at the time but subsequently approved.[574] The second site was denied an armoring permit, and no armoring was present on the property.[575]

Palm Beach County

In the course of conducting ground truthing activities, several structures were observed for which inquiries were made to the Bureau of Beaches and Coastal Systems for permits associated with the properties. First, dune restoration was observed at 5540 N. Ocean Dr. in Palm Beach County, in front of a condominium building called Water Glades. The inquiry to BBCS yielded two permits associated with Water Glades condominium, neither of which appears to be associated with the observed dune restoration. The first permit[576] was for a bulkhead or seawall, or return wall. The second permit[577] was for Vegetation, Native Salt Resistant for Beach/Dune Stabilization, or fill, but was from 1996. The observed dune restoration appears to have been conducted much more recently than 1996. Further research, however, revealed that DEP and BBCS had issued emergency permit PB-875 M1 E for emergency beach restoration activities, including placement of sand, after sub-tropical storm Andrea in 2007.[578]

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[570] DEP Permit Application #GU-450 AR ATF and violation file #VGU 06-03.

[571] DEP permit #s FR-816 AR ATF and FR-836 AR.

[572] DEP permit # IR-511 M1 and IR-511 M2.

[573] For more detailed information on ground truthing activities and photos, see appendices D-F.

[574] DEP permit #MI-461 AR ATF.

[575] DEP permit #MI-426.

[576] DEP permit #PB-910.

[577] DEP permit #PB-542.

[578] It is unclear why the initial inquiry to BBCS did not reveal the existence of this permit.

Second, a new sea wall was observed at 5440 N. Ocean Dr. in Palm Beach County, in front of a condominium building called Aquarius. The inquiry to BBCS yielded one permit associated with the address. In that permit, the restoration or repair of sand retaining walls was approved in July 2007.

Finally, a new sea wall was observed at 5420 N. Ocean Dr. in Palm Beach County, in front of a condominium building called Connemara. The inquiry to BBCS yielded two permits, PB000832 and -8021778. PB-832 was for a Bulkhead or Seawall and a Return Wall (all approved). -8021778 was for Vegetation, Native Salt Resistant for Beach/Dune Stabilization; Fences and Railings - Privacy, Safety, Security and Ornamental; and Walkways, Walkover Structures, Boardwalks and/or Stairs (all approved).

Researchers also observed that the sea wall constructed at 5420 N. Ocean Drive in front of the Connemara building extended to a large portion of the property of the Sea Dunes building, which applied for an armoring permit.[579] This permit was not issued but was waived until March 22, 2008. Thus, the legal status of the seawall extending in front of the Connemara building was not clear.

Walton County[580]

Inquiries indicated the existence of at least eleven after-the-fact (ATF) permits for coastal and shore protection structures that had been denied in Walton County, as of August 22, 2007. Ten of the properties corresponding to the permits contained the structures or dune restoration activity that had been denied. For example, at one property, for which an ATF armoring permit was denied on November 9, 2006, an armoring structure was observed in August 2007. As of April 2008 the head of enforcement for BBCS said that all but one of the ten properties visited by researchers was permitted by Walton Cty. and all but one has challenged the DEP permit denial.

13. Structural Problems

The stated goal of the CCCL is "to preserve and protect [Florida's beaches] from imprudent construction, [which can] accelerate erosion, provide inadequate protection to upland structures, endanger adjacent properties, or interfere with public beach access."[581] While it appears common sense to assume that a program with the stated goal of protecting beaches would protect the sea turtles that depend on those beaches for their habitat, this is not the case.

The CCCL program is a program designed to issue permits for coastal construction. Such construction is not supposed to be "imprudent construction which can jeopardize the stability of

[579] Permit application PB-904.

[580] University of Florida graduate student Lori Brinn conducted the onsite visits for ground truthing in Walton County.

[581] FL. STAT. § 161.053 (2007).

the beach-dune system. . . .", but defining "imprudent construction" and "stability of the beach-dune system" focuses primarily on minimizing storm and erosion-related losses for people. Thus, Florida's Department of Environmental Protection emphasizes the great decrease in loss of structures and concomitant decrease in insurance claims for structures permitted under the CCCL program.[582]

This focus relegates the general ecosystems that relate to the beach as little more than tools to further storm protection. For example, while statutes and rules mention turtles in several places,[583] the only real reason for turning down a project due to turtle impacts is when the Florida Fish and Wildlife Conservation Commission determines that the construction would constitute a "take" of sea turtles. Yet it is hard to imagine that the continued construction of sea walls on beaches that continue to migrate towards the sea wall will leave sufficient dry-sand beach habitat for sea turtle nesting. When migrating beaches encounter armoring or other development, it can be of little solace that the permit for the development interfering with the beach included no net excavation of sand and minimized damage to native plants.

It is no surprise that CCCL permitting could lead to an eventual loss of dynamic beaches for sea turtle nesting since the CCCL's structure fails to account for SLR.[584] Siting and design permitting critieria for major habitable structures and coastal armoring do not account for the processes of SLR.

As further evidence of the bias towards protection of property in the CCCL, it should be noted that DEP and the BBCS have not interpreted the phrase "beach-dune system" to include sea turtles or other life that depends on the beach-dune system." One result of this narrow interpretation is that BBCS then has the authority to modify the timing or nature of a project to protect sea turtles, but not the siting of the project.[585] Again, siting of development without regard to the long-term impacts of SLR will lead to extensive armoring that will eliminate turtle-nesting beaches, all done legally because the law neither forces DEP to look at the future repercussions of its permitting program nor does the law explicitly place the risk of coastal erosion and SLR losses with private property owners.

F. *Emergency Permitting*

[582] *See infra* note 592 and accompanying text.

[583] *See supra* Part III.D.2.

[584] The one exception to this rule appears at FLA. ADMIN. CODE r. 62B-41.005(7)(c). This rule authorizes, but does not require, DEP to consider the effects of SLR on permitting, but only for projects below the mean-high water line. Thus, this applies to nourishment but not to sea walls.

[585] FLA. STAT. § 161.053(5)(b) (2007). Siting is still affected by whether the Florida Fish and Wildlife Conservation Commission will call a "take" of sea turtle due to habitat modification, but this usually only occurs for armoring.

DEP's BBCS and local governments can issue emergency armoring permits,[586] but local government emergency permitting for armoring has generated significant controversy in both cases in where it has seen extensive use. The first widespread use of this authority was Indian River County, which issued a number of emergency armoring permits after hurricane Erin in 1995. The potential for "take" of sea turtles by emergency armoring led Indian River County to working with the U.S. Fish and Wildlife Service to develop a habitat conservation plan under the U.S. Endangered Species Act, which then allowed Indian River County to receive an incidental take permit that would allow the county to issue future emergency armoring permits.

The severe erosion during 2004 and 2005 in Walton County again led to extensive granting of emergency armoring permits by a local government. Walton County issued about 250 emergency armoring permits. Many of these are now applying for after-the-fact permits. Eighteen after-the-fact armoring applications for armoring had been denied as of March 13, 2007, and all but one of these has filed a challenge to the permit denial. The experience of Walton County can help to shed light on some of the problems with local government authority to grant temporary emergency armoring permits.

The statute granting local governments authority to permit temporary emergency armoring stipulates that it shall only be authorized when a private structure or public infrastructure is threatened.[587] Local governments should also take into account a list of criteria similar to the ones considered by DEP in the CCCL program. These include protecting the beach-dune system, siting and design of the structure, impacts on adjacent properties, preservation of public beach access, and protection of native coastal vegetation, nesting threatened or endangered species, and nesting marine turtles and their hatchlings.[588]

Statutes require local governments to inform DEP when the local government issues an emergency armoring permit.[589] However, it appears that local governments sometimes do not accurately inform DEP when they issue emergency permits. For example, Walton County not only failed to accurately inform DEP of all emergency permits it issued, but the county sometimes even said that no county permits existed for work that did have county permits. This seemed to be a symptom of a local permitting system without the administrative capacity to function properly. The county sometimes issued permits to different properties with the same permit number, and referenced properties inconsistently in documents, sometimes using a parcel number, sometimes address, or other methods. This has generated problems as the State attempts to come to grips with the armoring on Walton County beaches. Even were Walton County to have submitted an accurate and detailed list of all the temporary emergency armoring permits it had granted, DEP does not maintain a database that contains such information.

[586] FLA. STAT. § 161.085(3)-(8) (2007).

[587] *Id.* at § 161.085(3) (2007).

[588] *Id.* at § 161.085(3)(a)-(e) (2007).

[589] *Id.* at § 161.085(4) (2007).

Statutes also require that emergency armoring issued by local governments be "temporary" in nature.[590] Despite this, those familiar with the issue inside and outside of DEP usually acknowledge that there is usually no difference between "temporary" armoring and that which is intended to be permanent. If the armoring consists of sheet piling, the concrete cap that often covers the top might be left off as evidence that the sheetpiling is "temporary." Nonetheless, once armoring is in the ground, everyone agrees that it is very unusual that the armoring would be removed.

Due to extensive problems with emergency permitting, in 2006 the Florida legislature amended Florida Statutes to give DEP the ability to revoke the right of local governments to issue emergency armoring permits.[591]

G. *Can the CCCL Program Protect Sea Turtle Habitat?*

Arguably the CCCL program has not proven to be the best tool for long-term protection of dynamic beaches as turtle nesting habitat. In addition to the program's failure to consider SLR, the program seems at least, if not more, focused on protecting private structures than on protecting the beach-dune system or the ecosystems that depend on the beach. For example, a report from DEP stated that

> The storms of the very active 2004 and 2005 hurricane season produced similar, extensive damage. Most of the damage occurred to habitable structures (which include single and multi-family homes) constructed prior to the establishment of the state's CCCL Program and as a result were not built to the more stringent construction standards of the current program. Habitable structures built to the CCCL Program's standards (those constructed to withstand the wind and water forces experienced in a high hazard coastal zone) survived. Specifically, of the 1,992 major habitable structures impacted by Hurricane Opal, 768 (or 40%) were destroyed. On the other hand, of the 576 structures permitted by the CCCL Program, only 2 (or 0.2%) were destroyed. Experiences during the 2004 and 2005 hurricane seasons confirmed the importance of CCCL Program standards in reducing damage to structures and the beach and dune system.[592]

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[590] *Id.* at § 161.085(6) (2007).

[591] Laws of Florida ch. 2006-99, § 1.

[592] DIVISION OF BEACHES AND COASTAL SYSTEMS, FLORIDA DEPT. OF ENVIRONMENTAL PROTECTION, THE HOMEOWNER'S GUIDE TO THE COASTAL CONSTRUCTION CONTROL LINE PROGRAM (February 2006). This quote from the BBCS demonstrates the focus in Chapter 161 on making structures built on or next to beaches safer. The article provides statistics to back up its assertion that Chapter 161 has indeed made structures located on the coasts safer. However, the assertion that the CCCL Program has reduced damage to the beach and dune system has no similar substantiation in the document.

The CCCL program's focus on protecting dunes, which on many beaches have been long destroyed or never really existed, misses a critical point: beaches need the space to migrate regardless of whether the beach has a dune, escarpment, or other feature behind it. Better siting decisions in the CCCL program could effectuate this if effective CCCL program regulations were able to realize the stated goal of Chapter 161 to site construction "a sufficient distance landward of the beach to permit natural shoreline fluctuations and to preserve dune stability."[593] Unfortunately this statutory directive is not effectively implemented by the CCCL program. Current regulations are severely limited in part because of the word "dune" in the need to protect the "beach-dune" system and "dune stability." DEP appears to have interpreted this to mean that they have less authority to protect the dynamic nature of the beach if clear dunes are not present. Eliminating the phrase "beach-dune system" and replacing it with "dynamic beach system" would give DEP better statutory authority to protect the dynamic beach even if classic "dunes" are not present.

In addition, it appears that the future elimination of beaches due to permitting structures now that will come into direct conflict with the beach due to SLR does not rise to the level of "take." An administrative law judge has held that where the statistical probability of sea turtle nesting actually occurring on the property in question is extremely low, the statutory definition of "take"[594] is not met because "future habitat impacts of the dwelling are speculative and cannot be interrupted [sic] to cause an actual killing or injuring of a marine turtle or to significantly impair marine turtle habitat."[595] In coming to this conclusion, the administrative law judge noted that "[s]ince the definition of 'take' in Section 370.12(1)(f) is the same as the definition of 'take' under the Federal Endangered Species Act (ESA) and its implementing regulations, federal case law is instructive on the issue of speculative take."[596] Further, the case suggested that even if a permitted structure subsequently became located in the vicinity of sea turtle nesting habitat (i.e. because of the erosion of a dune that formerly kept sea turtles away), a take would not occur

[593] FLA. STAT. § 161.55(3) (2007).

[594] Fla. Stat. § 370.12(c)(1) defines "take" as "an act which actually kills or injures marine turtles, and includes significant habitat modification or degradation that kills or injures marine turtles by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering."

[595] Barnett and Hanlon v. Wentz and DEP, 2003 WL 21312172 20 (FLA. DIV. ADMIN. HRGS. 2003) (Here, the facts leading to the conclusion that the property was not located in sea turtle nesting habitat were as follows: "The location of the proposed dwelling is not marine turtle nesting habitat at the present time. There is no preponderant evidence that a marine turtle has ever nested in the area of the beach dune system where the dwelling will be located. The dune scarp or artificial berm will prevent marine turtles from nesting in the area of the proposed dwelling as long as the artificial dune or berm lasts. Statistically speaking, the chance that a marine turtle might nest on the property is once every two years."). This administrative case was a recommended order. The final order on the permit challenged in *Barnett and Hanlon v. Wentz and DEP* was denied, 2003 Fla. ENV LEXIS 231, but the final order accepted the administrative law judge's sea turtle take analysis. *Id.*

[596] Id. at 21; That federal case law includes Babbitt v. Sweet Homes Chapter of CMTYS. For A Greater Oregon, 515 U.S. 687 (1995), Defenders of Wildlife v. Bernal, 204 F.3d 920 (9th Circuit 1999), and National Wildlife Federation v. Burlington Northern Railroad, 23 F.3d 1508 (9th Cir. 1994).

because a.) "a nesting turtle encountering the dwelling has the option of false crawling" and b.) nests can "be relocated since nest relocation is an accepted, successful and routine practice."[597]

H. *Suggestions for Reform of the CCCL Program*

Suggestions for reform included in this white paper are founded on the basic realizations that SLR is already occurring and will become more rapid, nourishment will not be able to protect all sand beaches in Florida from all the effects of SLR, and Florida wants to maintain at least some natural beaches. Another basic premise of the suggestions included here is that the risk for constructing in the coastal zone, especially for new construction, should rest with the property owners and should not be borne by the public through the need of the public to choose between protecting/purchasing threatened property or loss of the beach.[598]

- Account for a substantial amount of SLR in determination of the CCCL.
- Broaden application and authority of Dept. of Envt'l Protection to protect the beach by replacing the phrase "beach-dune system" in Chapter 161 with "dynamic beach system." This would overcome the limitation on the Department's authority to act if classic beach dunes are not present.
- Establish area- or region-wide construction setbacks
- Improve the transparency of the permitting process by creating detailed templates and matrices for analysis of impacts of proposed projects. The methods and evidence included in such analyses should be clearly represented in the permit file and understandable to those reviewing the file.
- Either eliminate the statute granting local governments authority to issue temporary armoring permits or reform it by specifying in the statute that issuance of a local permit does not assure issuance of a permanent state permit, that all risk of failure to receive a permanent state permit resides with the property owner, and that prior to construction a property owner must post a bond for removal costs should the state permit be denied.
- All permits for new, non-armoring construction should require a deed restriction noting that the property will never be allowed to armor the property.
- All new permits for non-armoring should require an easement whereby the property owner must remove any structure interfering with the natural dynamics of the dynamic beach system.[599]
- The "line-of-construction" provisions should be modified to set minimum requirements to assure that it is only applied in situations of existing, high-density construction; the provisions should also set criteria defining a "reasonably continuous and uniform line of

[597] Barnett and Hanlon v. Wentz and DEP, 2003 WL 21312172 20 (FLA. DIV. ADMIN. HRGS. 2003).

[598] One exception to this could be erosion that is clearly caused by maintenance of an artificial inlet. *See supra* notes 57-58 and accompanying text (discussing 2008 legislation in Florida making the State responsible for inlet erosion).

[599] "Interference" here should be defined as when a structure intrudes onto the dry sand beach or seaward of the vegetation line.

construction" that qualifies as the basis for exception. (Alternative: establish area- or region-wide setbacks)

- The term "unduly affected by erosion" should be statutorily defined to include any property which has armoring, which has applied for armoring, which is on a nourished beach, which lies seaward of the 30-year erosion projection line (as modified per suggestions below), or is in an area classified as "critically eroding."
- The current "eligibility" requirement for armoring should be modified to add that structures built without a CCCL permit are not eligible unless they are within a densely-developed area served by central water and sewer.
- Current "eligibility" requirements should be modified to prohibit armoring for any structure built after 2008.
- All major habitable structures receiving a permit to build, construct additions, or rebuild should be required to record a deed restriction prohibiting any armoring of the property where the project is located.
- The 30-year erosion projection should be extended to consider a longer time frame; the time frame could, if desired, be divided into one time frame for single family homes and a longer one for major infrastructure, commercial, or multifamily dwellings.
- Account for a significant time span of SLR in calculation of the 30-year erosion projection line.
- No credit for nourishment projects should be given when calculating the 30-year erosion projection unless the nourishment project is determined to be necessary exclusively due to erosion caused by inlet maintenance.
- The 30-year erosion projection line should be placed at the landward toe of the primary dune, when present, rather than at the seasonal high water line. Other provisions should be developed for a setback when no discernible dune is present. The 30-year erosion projection should *never* simply be placed at the existing "line of construction" as a default.
- Limitations on new development should be developed for areas that currently have primarily residential, low-density residential, or limited development. Several possible options could serve this end:
    - New structures might be allowed in low-density or undeveloped areas seaward of the CCCL only if the building is designed to be disassembled and/or moved and if the property owner can demonstrate fee-simple ownership of an undeveloped lot (with deed restrictions limiting its use to relocation of the proposed structure) significantly landward and within a reasonable distance of the proposed structure's site.
    - Alternatively, a new structure might be allowed if the structure is built to fail in an extreme storm event and rebuilding would be dependent upon sufficient space remaining on the affected property. Any such permit should also require a bond or insurance policy to pay for clean up of a destroyed structure.
    - Alternatively, a new structure might be allowed if the proposed property has sufficient depth to allow relocation behind the projected location of the landward toe of the primary dune as determined by the modified 30-year erosion projection.
- Rebuilding of damaged structures should be limited and conditioned to discourage substantial new investment in existing properties, thus promoting the possibility of eventual relocation out of highly hazardous areas.

  - A major habitable structure should be allowed to be rebuilt only once with the permit conditioned on recordation of a deed restriction noting that future rebuilding in the same location is prohibited. In addition, no rebuilding should be permitted in the coastal high hazard area,[600] which may need to be redefined to include more than just the area subject to a category 1 storm surge.
  - Rebuilding of armoring should be modeled on Brevard County's approach of only allowing a rebuild if the cost is less than 50% of the sea wall. New armoring should generally be prohibited.[601]
- The "close-the-gap" provision should be modified to only apply in densely-developed areas. The impact of excluding property in non-densely-developed areas could be mitigated by a state law creating a right of action for property owners for damages due to the erosive effects of neighboring armoring.[602]
- The CCCL program should incorporate a significant program promoting accommodation of the dynamic beach system by offering incentives for relocation of existing structures prior to the structure's succumbing to forces of the beach or coastal storms.[603]
- Develop more rigorous standards for research on the environmental impacts of beach nourishment projects, including research design that assesses biota prior to nourishment, controls for ordinary temporal changes in biota, includes anonymous and independent peer review, considers cumulative impacts, and uses the best scientific tools and modeling practices.[604]

I. *Public Access as a Tool for Preservation of Dynamic Beaches*

Lateral public access to beaches is not synonymous with preservation of turtle-nesting habitat, but lateral public access can serve a limited role as a proxy for preservation of turtle nesting

[600] This is defined as "the area below the elevation of the category 1 storm surge line as established by a Sea, Lake, and Overland Surges from Hurricanes (SLOSH) computerized storm surge model." FLA. STAT. § 161.3178(2)(h) (2007).

[601] Brevard County imposes strict limitations on new "hard" armoring but does allow "soft" armoring in the form of geotubes. However, such geotubes pose substantial problems for the beach-dune system. *See, e.g.* DEP Permit #BE-1142 (geo-tube that has failed to fulfill requirements for sand coverage in permit conditions every year since it was installed). In addition, a proposed rule published by DEP in the Florida Administrative Weekly, Volume 34, Number 17, April 25, 2008, would prohibit local governments from allowing geotubes as emergency armoring.

[602] Responsibility for erosion caused by one's action is not a radical change from the fact that the U.S. Army Corps of Engineers has already accepted responsibility for the erosion to nearby properties caused by its maintenance of Canaveral Inlet. *See supra* Part I.C. This same idea appears in 2008 legislation on inlet management and sand bypassing. *See supra* notes 57-58 and accompanying text (discussing 2008 legislation to make the State of Florida liable for inlet-induced erosion).

[603] *See supra* Part II.G. (discussing the Upton-Jones Amendment).

[604] Information on the failings of most environmental research on beach nourishment is available at Charles H. Peterson & Melanie J. Bishop, *Assessing the Environmental Impacts of Beach Nourishment*, 55 BIOSCIENCE 887 (Oct. 2005).

habitat in some instances. In those areas where the public has a right to move laterally across the beach, preservation of that right against armoring or interference by structures may help protect turtle nesting habitat. Public access to the beach has become a significant issue in Florida. In Walton County, the following sign was placed on a beach. There is no Florida Statute 16D2, nor is there a division 16D-2 in the "FAC" or Florida Administrative Code.

Both statutes and case law contribute to an understanding of the public's right to access to beaches and how this may contribute to protection of sea turtle nesting habitat.

1. Florida Statutes and Public Access

For the purposes of Florida statutes governing coastal construction, public access is defined as

> the public's right to laterally traverse the sandy beaches of this state where such access exists on or after July 1, 1987, or where the public has established an accessway through private lands to lands seaward of the mean high tide or water line by prescription, prescriptive easement, or any other legal means, development

> or construction shall not interfere with such right of public access unless a comparable alternative accessway is provided.[605]

Subsequent sections of statute emphasize that one goal of the regulation of coastal construction is protection of public access.[606] Other sections give DEP and the BBCS explicit authority or a mandate to consider public access in the permitting process.[607] Many, but not all,[608] statutory provisions to protect public beach access have potential to protect sea turtles depending on interpretation and regulation pursuant to statute. Research indicates that DEP and BBCS give little weight to public access concerns in decisions on siting. One DEP official stated that DEP does not look at lateral beach access as an issue in siting for major habitable structures. Public

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[605] FLA. STAT. § 161.021(1) (2007).

[606] For example, Florida Statute section 161.053(1)(a) states:

> The Legislature finds and declares that the beaches in this state and the coastal barrier dunes adjacent to such beaches, by their nature, are subject to frequent and severe fluctuations and represent one of the most valuable natural resources of Florida and that it is in the public interest to preserve and protect them from imprudent construction which can jeopardize the stability of the beach-dune system, accelerate erosion, provide inadequate protection to upland structures, endanger adjacent properties, or *interfere with public beach access*.

FLA. STAT. § 161.053(1)(a) (2007) (emphasis added). Further on, this same section also states:

> Special siting and design considerations shall be necessary seaward of established coastal construction control lines to ensure the protection of the beach-dune system, proposed or existing structures, and adjacent properties and the *preservation of public beach access*.

Id. (emphasis added).

[607] *See, e.g.* FLA. STAT. § 161.041 (2007) ("The department may require, as a condition to granting permits under this section, the provision of alternative access when interference with public access along the beach is unavoidable. The width of such alternate access may not be required to exceed the width of the access that will be obstructed as a result of the permit being granted."); FLA. STAT. § 161.052(12) (2007) ("This subsection does not limit or abrogate the right and authority of the department to require permits or to adopt and enforce environmental standards, including but not limited to, standards for ensuring the protection of the beach-dune system, proposed or existing structures, adjacent properties, marine turtles, native salt-resistant vegetation, endangered plant communities, and the preservation of public beach access."); FLA. STAT. § 161.053(5)(e) (2007) ("The department shall limit the construction of structures which interfere with public access along the beach. However, the department may require, as a condition to granting permits, the provision of alternative access when interference with public access along the beach is unavoidable. The width of such alternate access may not be required to exceed the width of the access that will be obstructed as a result of the permit being granted.").

[608] Florida Statute section 161.041 protects public access in projects extending below mean high water. If a project extends from dry land to below mean high water, granting public access over or landward of the project will not help replace lost sea turtle nesting habitat.

access does, on occasion, get mentioned in evaluations of armoring,[609] but research did not produce any denials in which harm to public access was the exclusive basis of the denial. Furthermore, DEP asserts it has no authority to look to the future impacts current DEP permitting decisions will have on lateral public access. Under this scenario, the "special siting and design considerations . . . necessary seaward of established coastal construction control lines to ensure the . . . preservation of public beach access" do not need to consider that permitting a wall or structure today may lead to loss of the public's beach in the future due to erosion and SLR.

2. Other States, the Common Law of Property, and Public Access

Oregon and Hawaii provide unique examples of public access to the beach. This section will discuss the most notable feature of each state's public access legislation and case law to determine what lessons Florida could learn from these state programs.

The Oregon legislature has firmly established statutory protection for public access to and recreational use of the Oregon coast. In clear terms, the legislature has declared that "it is in the public interest to do whatever is necessary to preserve and protect scenic and recreational use of Oregon's shoreline."[610] The legislature also aims to give permanent protection to public easements – acquired through dedication, prescription, grant, or other means[611] – for free, frequent, and uninterrupted use.[612] Similar to Florida, state ownership of the shoreline along the Pacific Ocean extends from the ordinary high tide line to the extreme low tide line.[613]
In *Thornton v. Hay*,[614] the Oregon Supreme Court held that the state could enjoin coastal property owners from erecting structures in the dry-sand area in front of their property.[615] Because these structures would have impeded public use and enjoyment of the dry-sand, the court also held that the state could further remove the structures by exercising an equitable right to protect the public.[616] The Oregon Supreme Court is alternately praised and reviled for reviving the common law doctrine of custom to protect the public's use of the dry-sand area, defined as the area between the mean high tide line and the visible line of vegetation.

[609] For example, DEP permit # FR-816 AR ATF notes in its denial that "the location of the structure at the water's edge . . . interferes with lateral public access, and no alternative access has been provided by the applicant." This formed one of the reasons for denial of the permit. The other reason is that the location of the structure was deemed a take of sea turtles.

[610] Ore. Rev. Stat. § 390.610(4) (2007).

[611] *Id.* § 390.610(2).

[612] *Id.* § 390.610(1)-(2).

[613] Exceptions to state ownership include lands divested before July 5, 1947. *Id.* § 390.615.

[614] State ex. rel. Thornton v. Hay, 462 P.2d 671, 672-73 (Or. 1969).

[615] 462 P.2d 671 (Or. 1969).

[616] *Id.* at 673.

Relying on the doctrine of custom to preserve public access, the court noted that "an established custom… can be proven with reference to a *larger* area."[617] This "larger area" refers to the ocean-front lands from the northern to southern border of Oregon, which the court opined should be treated uniformly.[618] The court rejected prescription because it applies only to a specific tract of land at issue and would not provide uniform treatment of Oregon's beaches.[619]

Customary use of the dry-sand areas is reflected in the beginning of Oregon's political history, when European settlers and other newcomers used the foreshore for clam-digging and the dry-sand for building fires.[620] This long-established use lead to a public mindset that the dry-sand areas are part of the public beach.[621] In addition, the court noted that the dry-sand area is generally not suitable for purposes other than recreation because the area has unstable seaward boundaries, is unsafe during winter storms, and is unsuitable for permanent structures.[622] Finally, the court noted that a custom-based rule for public access precludes takings claims because the application of the rule "takes from no man anything which he has had legitimate reason to regard as exclusively his."[623]

While the Oregon Supreme Court in *Thornton* seemingly extended the doctrine of custom to all ocean-front property, it later narrowed its ruling in *McDonald v. Halvorson*.[624] Here, the court limited the application of custom to beaches "similarly situated" as the beach in *Thornton*, which was a sandy beach that abutted the Pacific Ocean. Thus, gravel and boulder beaches formed in inlets would fall under the doctrine only upon separate and independent establishment of the elements of custom.[625] However, the public may always acquire and establish a right through dedication or prescription.

As noted by the court in *Thornton*, the doctrine of custom is a "background principle" under the Fifth Amendment Takings jurisprudence articulated by the Supreme Court in *Lucas v. South*

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[617] *Id.* at 673-74 (emphasis added).

[618] *Id.*

[619] *Id.*

[620] *Id.* at 673.

[621] *Id.*

[622] *Id.* at 673-74.

[623] *Id.* at 678.

[624] 780 P.2d 714 (Or. 1989).

[625] The following elements of custom must be established: (1) the use is ancient such that the "memory of man runneth not to the contrary"; (2) the use is exercised without interruption, even if not continuously; (3) the use is peaceable and free from dispute; (4) the use is reasonable for the land and in the community; (5) the use certain, in both visible boundaries and the character of the land; (5) the use is obligatory such that the owner has no option but to recognize the use; and (6) the use is not repugnant or inconsistent with other customs or other law. *Thornton*, 462 P.2d at 677.

Carolina Coastal Council.[626] In 2006, the Oregon Supreme Court explicitly stated that the doctrine of custom is not "newly legislated or decreed" because for at least eighty years, the state has claimed interest in the dry-sand beaches. *Stevens v. City of Cannon Beach* involved coastal property owners who applied for and were denied a permit to build a seawall on their property.[627] The court found that the property owners were on notice that "exclusive use of the dry-sand areas was not part of the 'bundle of rights' that they acquired" upon purchasing the property because public use of the dry-sand area is "so notorious" that notice is presumed.[628] Thus, the coastal property owners did not suffer a compensable Fifth Amendment taking.[629]

Public access to beaches in Hawaii relies on state ownership rather than custom.[630] The shoreline in Hawaii is markedly landward, defined as "the upper reaches of the wash of the waves." This shoreline marks the boundary between public beaches and private land and is derived from "ancient Hawaiian tradition, custom, practice, and usage."[631] Hawaiian coastal construction statutes require setbacks from a certified shoreline, which the Hawaii Supreme Court recently interpreted as the "highest reach of the highest wash of the waves" in non-storm and non-tidal conditions.[632] In a state where beach culture shapes the economy and lives of Hawaiians, the court reaffirmed the public policy of extending public use and ownership to "as much of Hawaii's shoreline as reasonably possible."[633] For certification purposes, the highest reach may be measured by either the debris line or the vegetation line, with no preference for either. Property owners may not, however, try to manipulate the location of the shoreline by planting new plants seaward of the natural plant line.[634]

In 1959, the Texas Legislature passed the Open Beaches Act in response to a Texas Supreme Court ruling that limited state ownership to the wet beach.[635] The Act mandates the public's

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[626] 505 U.S. 1003, 1029 (1992).

[627] 854 P.2d 449, 456-57, 460 (Or. 1993), *cert. denied*, 510 U.S. 1207 (1994). The property owners were denied a permit based on numerous factors, including: failure to comply with permit requirements and policies; failure to demonstrate that seawall was required for lack of other methods of erosion control; failure to demonstrate that the area required a new seawall; seawall would obstruct the view, eliminate dry-sand area, pose an obstacle for an escape route from the beach; and seawall negatively affected neighboring property by contributing to accelerated erosion. *Id.* at n.4.

[628] *Id.* at 457.

[629] *See also* David J. Bederman, *The Curious Resurrection of Custom: Beach Access and Judicial Takings*, 96 COLUM. L. REV. 1375, 1442-46 (1996).

[630] *See* Simeon L. Vance & Richard J. Wallsgrove, *More Than a Line in the Sand: Defining the Shoreline in Hawai'i After* Diamond v. State, 29 U. HAW. L. REV. 521 (2007).

[631] Diamond v. State, 145 P.3d 704, 711 (Haw. 2006).

[632] *Id.* at 716.

[633] *Id.* at 716-17.

[634] *Id.*

[635] TX. NAT. RES. § 61.011 (2007); Luttes v. State, 324 S.W.2d 167 (1958).

"free and unrestricted right of ingress and egress" on state-owned beaches along the Gulf of Mexico. More importantly, the Act extends the public right to areas over which the public has acquired an easement through prescription, dedication, or custom.[636] In enforcing the act, an attorney general must establish an obstruction of public access to the beach by showing that the object or structure (1) constitutes "an imminent hazard to safety, health, or public welfare" or (2) "substantially interferes with the free and unrestricted right of the public to enter or leave the public beach or traverse any part of the public beach."[637]

To establish an easement by prescription under Texas law, the user must establish the elements of adverse possession.[638] Texas courts have consistently found easements by prescription to continue public access to the beach.[639] In *Seaway Co. v. Attorney General*, evidence based on witness testimony of public use of the beach, Texas Highway Department maps showing public roads on the beach, historical guides showing public use, and city management of beach sufficiently established an easement by prescription.[640] In one scholar's opinion, maintaining public access to Texas beaches by establishing an easement by prescription "should continue to be a highly effective method of providing open beaches… unless the courts decide to enforce the exclusivity requirement."[641]

To establish an easement by dedication, the user may establish either an express dedication or an implied dedication. In the former, the coastal property owner expressly manifests her intent to dedicate her property for public use. In the latter, the following elements must be established:

> (1) the acts of the landowner induced the believe that the landowner intended to dedicate the [property] to public use; (2) [the landowner] was competent to do so; (3) the public relied on these acts and will be served by the dedication; and (4) there was an offer and acceptance of the dedication.[642]

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[636] Specifically, the Act states that "[i]t is declared and affirmed to be the public policy of this state that the public, individually and collectively, shall have the free and unrestricted right of ingress and egress to and from the state-owned beaches bordering on the seaward shore of the Gulf of Mexico, or if the public has acquired a right of use or easement to or over an area by prescription, dedication, or has retained a right by virtue of continuous right in the public, the public shall have the free and unrestricted right of ingress and egress to the larger area extending from the line of mean low tide to the line of vegetation bordering on the Gulf of Mexico." TX. NAT. RES. § 61.011(a) (2007).

[637] *Id.* § (d)(9).

[638] The elements of adverse possession are (1) actual possession of the land, (2) an adverse claim to the land, (3) notorious use by the public, (4) exclusivity, and (5) continuous use. Mark D. Holmes, *What About My Beach House? A Look at the Takings Issue as Applied to the Texas Open Beaches Act*, 40 HOUS. L. REV. 119 (2003).

[639] Neal E. Pirkle, *Maintaining Public Access to Texas Coastal Beaches the Past and the Future*, 46 Baylor L. Rev. 1093, 1097 (1994).

[640] Seaway Co. v. Attorney General, 375 S.W.2d 923 (Tex. Civ. App. 1964).

[641] Pirkle, *supra* note 639, at 1097.

[642] Lidner v. Hill, 691 S.W.2d 590 (Tex. 1985) (quoting Las Vegas Pecan & Cattle Co. v. Zavala County, 682 S.W.2d 254, 256 (Tex. 1984)).

Texas courts seem to generously interpret these elements. For example in *Villa Nova Resort, Inc. v. State*, the court found that public use and enjoyment of the beach indicates "an intent to dedicate the area to the public."[643]

To establish an easement by custom or continuous use, the public's use must be so long-established that continued use becomes a "relative necessity."[644] In the single Texas case to uphold an easement by custom, the court stated:

> No one doubts that proof exists from which the district court could conclude that the public acquired an easement over Galveston's West Beach by custom. As early as 1836, the public used the beach for travel. That use has continued through the years. In [*Seaway*] one reads recollections of venerable witnesses about a lifetime of driving, swimming and fishing along the Galveston beach. No one ever asked these persons if they had permission to use the beach and no one ever tried to stop them from that use. These persons just "figured" everyone had the right to use the beach.[645]

What truly expands and distinguishes the Open Beaches Act is Texas' explicit recognition of a rolling easement.[646] First recognized in *Feinman v. State*,[647] a rolling easement permits the public's easement to shift with the dynamic boundaries of the shoreline. Thus, in certain cases, the public may gain an easement across coastal property having never used that portion of the property. One justification for the expansion of a public easement is that if coastal property owners benefit by gaining coastal property through accretion, they must also bear the risk of losing property through erosion.[648] In *Mikeska v. City of Galveston*, the Fifth Circuit recognized that "to prevent destruction of the public beach from a landward shift of the mean low tide line, the legal boundaries of the public easement change with their physical counterparts."[649] A federal district court later summarized the Fifth Amendment argument, stating that the natural movement of the beach "does not work a constitutional wrong."[650]

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[643] Villa Nova Resort, Inc. v. State, 711 S.W.2d 120 (Tex. 1986); see also Moody v. White, 593 S.W.2d 372 (Tex. Civ. App. 1980) (intent can be implied by grantor's conduct, open acts, and other circumstances that evince intent; public can "accept" offer by general and customary use, including swimming, fishing, and engaging in other activities).

[644] Holmes, *supra* note 638, at 131-32.

[645] Matcha v. Mattox, 711 S.W.2d 95, 99 (Tex. App. 1986).

[646] Rolling easements are described more fully in below in Part IV.E.

[647] Feinman v. State, 717 S.W.2d 106 (Tex. App. 1986) (concluding that "the vegetation line is not stationary and that a rolling easement is implicit" in the OBA).

[648] Holmes, *supra* note 638, at 145.

[649] Mikeska v. City of Galveston, 451 F.3d 376, 378 (5th Cir. 2006)

[650] Severance v. Patterson, 485 F. Supp. 2d 793 (S.D. Texas 2007).

While coastal property owners in Texas have attempted to assert Fifth Amendment takings effected by the Texas Open Beaches Act, courts have consistently rebuffed these assertions. Texas courts have focused on the "background principles" exception to the *Lucas* categorical regulatory takings and have focused on the lack of government action. First, coastal property owners in Texas are inherently limited in their ability to exclude the public "seaward of the dynamic, natural boundary of the beach."[651] Thus, these owners are also limited in their ability to establish a constitutionally-protected property right where a fundamental right – the right to exclude – is already somewhat circumscribed. Moreover, basic and widespread familiarity with beaches and coastal dynamics leads most coastal property owners to purchase with the knowledge that the beach boundary is not and cannot be dictated by the plat lines on a property map. This prior knowledge further limits the property right as the Constitution "does not guarantee or require static real property boundaries."[652]

Second, courts repeatedly emphasize that the easement is not a result of the Act but rather a mere recognition of an easement that existed prior to the Act. In *Arrington v. Mattox*, the court stated:

> The fundamental distinction is between a governmental taking of an easement through an act of sovereignty and judicial recognition of a common law easement acquired through historical public use. The Open Beaches Act does not empower the Attorney General to take rights from an owner of land, but merely furnishes a means for the public to enforce its existing collective rights.[653]

Most recently, a Texas district judge ruled in favor of state enforcement of the Act, ordering beach homeowners to move their homes off a beach that became public as a result of erosion.[654] In the Village of Surfside Beach, several beach homes ended up seaward of the vegetation line due to migration of the shoreline.[655] Enforcing the Texas Open Beaches Act, the state offered to pay each homeowner $50,000 to move her home and ultimately severed water and sewer utilities to the houses. The Texas Land Commissioner also pointed to the lack of state action, stating:

> [T]he houses on the beach must go. The government is not responsible for creating this situation. I am not trying to take these people's homes away, I don't want and can't do anything with these houses. It's like when a river changes course and alters international boundaries, they have forever lost their land."[656]

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[651] *Id.*

[652] *Id.*

[653] Arrington v. Mattox, 767 S.W.2d 957 (Tex. App. 1989).

[654] Hunter Sauls, *Ruling Supports Houses' Removal*, available at http://thefacts.com/story.lasso?ewcd=dd6332f29a19bd5b.

[655] *Id.*

[656] Hunter Sauls, Galveston County Daily News, Judge backs beached house plan (April 14, 2007), available at http://news.galvestondailynews.com/story.lasso?ewcd=d820bc98becea1d1.

3. Florida, the Common Law of Property, and Public Access

Unlike Texas, Oregon, and Hawaii, Florida's interpretation of the common law of property and beach access has been far less protective of public beach access.

Florida courts have recognized public access to beaches through dedication, prescription, and customary rights.[657] To establish an easement by either express or implied dedication, the applicant must establish that the owner intended to dedicate her coastal property (1) in a written instrument; (2) by designating public use on a filed plat; (3) through recitals in a deed; (4) through oral declarations and consistent acts; (5) through affirmative acts by the owner; or (6) through acquiescence of public use by the owner.[658] However, critics consider dedication ineffective to acquire public access to the dry sand beaches of Florida because public use of dedicated property is treated as a license and thus revocable by the owner and because dedication requires a piecemeal approach to establishing public access.[659] Moreover, in *Trepanier v. County of Volusia*, a recent Florida case, the Fifth District Court of Appeals required "clear and unequivocal" proof of dedication.[660] Although the plat for the development dedicated the "boulevards, avenues, streets, roads, and drives to the public use," the court found that the dedication did not extend to the dry sand beaches along the shoreline.[661]

Thus, perhaps the more effective means of establishing public access to and thus protection of the beach are through prescription and customary use. Prescription requires adverse use of property; the use must be known to the owner or open and notorious; the use or possession must be inconsistent with the owner's use and enjoyment of the property; and must not be by permission from the owner.[662]

In general, Florida courts adhere to a strict requirement of adversity.[663] For example, in *City of Miami Beach v. Undercliff Realty & Investment Company*, the Florida Supreme Court found that "the fact that the upland owners did not prevent or object to [public use] is not sufficient" to show that the public use was adverse or under a claim of right.[664] Also in *Trepanier*, the court found conflicting evidence regarding the continuity of the public's use of the beach as a vehicle thoroughfare, noting the alteration of routes following the hurricane seasons in 1999 and 2004

[657] S. Brent Spain, *Florida Beach Access: Nothing but Wet Sand?*, 15 J. Land Use & Envtl. L. 167, 171-72 (1999).

[658] City of Palmetto v. Katsch, 98 So. 352 (Fla. 1932).

[659] *Id.*

[660] Trepanier v. County of Volusia, 965 So. 2d 276, 286 (Fla. 5th DCA 2007).

[661] *Id.*

[662] *See, e.g.* Downing v. Bird, 100 So.2d 57, 64 (Fla. 1958).

[663] Spain, *supra* note 657, at 173.

[664] City of Miami Beach v. Undercliff Realty & Inv. Co., 21 So. 2d 783, 786 (Fla. 1945).

and the existence of dunes prior to 1999 where the public was currently using the dry sand beach.[665]

The seminal case in Florida regarding acquisition of dry sands beach through custom is *City of Daytona Beach v. Tona-Rama, Inc.*[666] The Florida Supreme Court stated:

> The beaches of Florida are of such a character as to use and potential development as to require separate consideration from other lands with respect to the elements and consequences of title. The sandy portion of the beaches are of no use for farming, grazing, timber production, or residency-the traditional uses of land-but has served as a thoroughfare and haven for fishermen and bathers, as well as a place of recreation for the public. The interest and rights of the public to the full use of the beaches should be protected.[667]

In this case, although the court did not find a public right through prescription or dedication, the court borrowed from the State of Oregon in adopting and reviving custom. To establish public access by custom, the applicant must show that the use has been "ancient, reasonable, without interruption and free from dispute."[668] A right established by custom does not create any interest in the land itself, and the public may abandon or the government may regulate the customary use.[669]

In *Trepanier*, the Fifth District Court of Appeal limited the holding in *Tona-Rama* to "the area of beach at issue in that case" instead of an expansive reading to "announce a right by custom for public use of the entire sandy beach area of the entire State of Florida."[670] The court's holding illustrates a significant obstacle to using custom to acquire public access – custom must be established for each portion of the coastline and cannot be applied at once to the entire coastline.[671]

As discussed earlier, the distinguishing feature of the Texas Open Beaches Act is the recognition of a rolling easement – an easement that permits the public use to shift with the dynamic boundaries of the shoreline.[672] While Florida's underlying legal framework regarding public access by dedication, prescription, and easements is similar to that of Texas, Florida courts have

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[665] *Trepanier*, 965 So. 2d at 284.

[666] 294 So. 2d. 73 (Fla. 1974).

[667] *Id.* at 77.

[668] *Id.*

[669] *Id.* at 78.

[670] *Trepanier*, 965 So. 2d at 288.

[671] Meg Caldwell & Craig Holt Segall, *No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast*, 34 ECOLOGY L.Q. 533, 556 (2007).

[672] *See supra* Part III.I.2 (discussing the Texas Open Beaches Act).

yet to recognize such expansive public access rights to the beach. In *Trepanier*, the court discussed the significance of rolling easements, as distinguished from migration of the mean high water line.[673] If the mean high water line migrates landward, the court noted that "the right of the public up to the mean high water line *does* migrate because of the constitutional reservation of title to all land seaward of the mean high water line."[674]

Here, the court adopted the distinction among accretion, avulsion, and erosion made by another Florida court:

> When land bordering a body of water is increased by *accretion* – … by such a slow and gradual deposit of particles that its progress cannot be always measured even though its results may be discerned from time to time – the new land thus formed belongs to the upland to which it attaches. …[W]hen the sea, lake, or navigable stream gradually and imperceptibly encroaches upon the land, the loss falls upon the owner, and the land thus lost by *erosion* returns to the ownership of the state. This is not the rule where the loss of the land occurs by *avulsion*, defined as the sudden or violent action of the elements, the effect and extent of which is perceptible while it is in progress. In such cases the boundaries do not change.[675]

Underlying this distinction and rule is the recognition that:

> The loss of lands by the permanent encroachment of the waters is one of the hazards incident to littoral or riparian ownership. Such changes are due to natural causes to which the courts have from time immemorial applied rules of law founded upon considerations of natural justice and public necessity.[676]

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[673] However, the court did not specifically refer to the movement of the public use as "rolling easements." It is ironic that the *Trepanier* case might be considered as positive for the protection of sea turtle nesting habitats since the County of Volusia argued the case on the basis of retaining public rights to *drive vehicles* along the beach. This despite the fact that in 2007, a survey of 73.9 kilometers of Volusia County beach totaled more than 1,500 loggerhead, green turtle, and leatherback nests. Fish and Wildlife Research Institute, *2007 Statewide Nesting Totals*, http://research.myfwc.com/features/view_article.asp?id=11812 (last visited April 24, 2008).

[674] *Trepanier*, 965 So. 2d at 292.

[675] *Id.* (*quoting* Siesta Props., Inc. v. Hart, 122 So. 2d 218, 220 (Fla. 2d DCA 1960) (*citing* In re City of Buffalo, 99 N.E. 850, 852 (N.Y. 1912))).

[676] *City of Buffalo*, 99 N.E. at 852. In this case, the New York Supreme Court referred to the long time lapse in erosion and accretion events versus the "sudden and violent" avulsion event. With the imperceptible gain or loss of land, the lapse of time "will preclude the identity of the property from being established upon its reliction," whereas a violent and perceptible impact may render the changed property as still belonging to the owner. *Id.* at 327-28. The time lapse for erosion or accretion also leads to "no reasonable hope or expectation that [the land] can ever be reclaimed." *Id.* at 328.

However, in *Trepanier* the court further noted that if customary use is rendered impossible as a result of the migrating mean high water line, "it is not evident… that the areas subject to the public right by custom would move landward with it to preserve public use on private property that previously was not subject to the public's customary right of use."[677] In the latter situation, customary use in the "new" area – in this case, on private land – must be established by proof.[678] The court rejected the Texas court's approach in *Matcha v. Mattox,* finding unsupported by evidence the Texas court's conclusion that "applying static real property concepts" to the dynamic beach would "produce completely unworkable results."[679] The Florida court dismissed the Texas decision as a "policy judgment" that the public's right results in greater good.[680] However, the Florida court left open the possibility that the migration of the area subject to customary use could be established by proof.[681]

As in Texas, where the public in Florida can ultimately establish a right to use the beach, a coastal property owner's takings claim would fail for lack of a constitutionally protected property right.[682]

IV. Additional Policies to Preserve Beaches as Dynamic Habitat

A. *Moving Forward Together: Policies and Implementation in Other States*

Some states and local governments have explicitly recognized SLR and have developed policies to respond. One of the oldest and still most progressive policies and responses is that of the Maine.

> The Legislature [of Maine] declares that certain areas of the Maine coast, because of their fragile nature, valuable habitat and their storm buffering abilities should be protected and conserved in their natural state and that it is inappropriate to use state funds to encourage or support activities incompatible with the ability of these areas to sustain these activities.[683]

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[677] *Id.* at 293.

[678] *Id.*

[679] *Id.* (*citing* Matcha v. Mattox, 711 S.W.2d 95, 100 (Tex. App. 1986)).

[680] *Id.*

[681] Florida's Fifth District Court of Appeals remanded the to the trial court for further development of the facts related to whether the beach moved due to erosion or avulsion and related to customary use. The trial on remand had not yet been scheduled as of late May 2008. Conversation with Daniel Eckert, Volusia County Attorney, May 21, 2008.

[682] *Id.*

[683] Maine Revised Statutes Title 38, Chapter 21, § 1901 (2007).

Maine law prohibits the use of state funds for construction or acquisition of buildings; construction of roads, airports, or bridges; or any shore stabilization activities within Maine's identified Coastal Barrier Resources System.[684] "In order to protect valuable coastal sand dune systems, the department will evaluate proposed developments with consideration given to future sea level rise and will impose restrictions on the density and location of development and on the size of structures."[685] Maine has strong restrictions on armoring, providing in its regulations that "No new seawall or similar structure may be constructed."[686]

Furthermore, Maine Department of Environmental Protection regulations acknowledge "a scientifically documented rise in relative sea level" and predicts that "sea level will rise approximately two feet in the next 100 years."[687] The regulations go on to integrate the likelihood of SLR in a meaningful way, taking it into account with provisions that seek to adapt to future change. For example, coastal projects may not be permitted "if, within 100 years, the property may reasonably be expected to be eroded as a result of changes in the shoreline such that the project is likely to be severely damaged after allowing for a two foot rise in sea level over 100 years."[688] Additionally, buildings over a certain size are prohibited unless the building's applicant can demonstrate that "the site will remain stable after allowing for a two foot rise in sea level over 100 years..."[689]

Brevard County, Florida's policy recognizes that the confluence of armoring and SLR has the potential to eliminate our beaches.[690] Brevard's county regulations state an intent "to discourage the further construction of rigid coastal and shore protection structures"[691] and recognize that these structures "block the movement of sand from the dunes to the beach, thereby preventing the natural renourishment of the sandy beaches."[692] These general statements of policy are realized in later regulatory provisions which prohibit new rigid coastal armoring or shoreline hardening structures in significant parts of Brevard County, except in certain narrowly defined

[684] Maine Revised Statutes Title 38, Chapter 21, § 1902 (2007). This limitation, if enacted in Florida, would dramatically alter Florida's contribution to beach nourishment, assuming that state coastal barrier resources would match those established under the federal Coastal Barrier Resources Act. For example, such a limitation would eliminate the almost $13 million that the State of Florida is contributing to nourishment activities on Cape San Blas in Florida's panhandle.

[685] 38 M.R.S.A. § 480-A (2007).

[686] Me. Code R. Chapt. 355, Rule 06-096 5. E.

[687] Me. Code R. Chapt. 355, Rule 06-096 1.

[688] Me. Code R. Chapt. 355, Rule 06-096 5.C.

[689] Me. Code R. Chapt. 355, Rule 06-096 5.D.1.

[690] Brevard County Code of Ordinances 62-4206(b).

[691] Brevard County Regulations, Chapter 62, Article XII, Sec. 62-4205.

[692] Brevard County Regulations, Chapter 62, Article XII, Sec. 62-4206(b).

emergency situations.[693] The armoring that is restricted here only includes "rigid coastal and shore protection structures," which are narrowly defined to mean "shoreline hardening structures including sea walls, bulkheads, revetments, mound structures, and groins and breakwaters."[694] Because of this narrow definition, "soft" armoring mechanisms, or sandbag systems (defined as "sandbags, geotextiles, tubes, and any other pliable or soft shoreline protection system meant as temporary erosion control measure"[695]) are not strictly limited and thus, have served as an alternative means of coastal protection.[696] Changes to statutes, however, no longer allow local governments to issue emergency temporary armoring permits for geotextile tubes.[697] Additionally, Brevard County also limits creating new hazards by prohibiting new construction of major habitable or major accessory structures seaward of the coastal setback line.[698]

Other states have recognized the threat of SLR as well. South Carolina has a regulatory provision that states: "It must be accepted that regardless of attempts to forestall the process, the Atlantic Ocean, as a result of sea level rise and periodic storms, is ultimately going to force those who have built too near the beachfront to retreat."[699] The Rhode Island Coastal Resources Management Council adopted a policy of accommodation of "a base rate of expected 3 to 5 foot rise in sea level by 2100 in the siting, design, and implementation of public and private coastal activities and to insure proactive stewardship of coastal ecosystems under these changing conditions."[700]

B. *Information to the Public*

[693] Brevard County Regulations, Chapter 62, Article XII, Sec. 62-4213(d) states: "No new rigid coastal armoring or shoreline hardening structures shall be permitted in unincorporated Brevard County south of Patrick Air Force Base (PAFB) property or within the Archie Carr National Wildlife Refuge, unless an emergency amendment to the coastal management element of the county comprehensive plan authorizing the construction of such a structure is approved by the board of county commissioners in accordance with the review procedures applicable to such emergency comprehensive plan amendments as set forth in F.S. Section 163.3187(a)."; Sec. 62-4213(e) states: "North of the PAFB, no new shoreline hardening structures should be permitted unless an emergency exists."

[694] Brevard County Regulations, Chapter 62, Article XII, Sec. 62-4201.

[695] Brevard County Regulations, Chapter 62, Article XII, Sec. 62-4201.

[696] Telephone interview with Darcy McGee (Special Project Coordinator, Environmental Permitting Section, Brevard County Natural Resources Management Office). April 10, 2008.

[697] 2007 Fla. Laws ch. 99, § 1 (codified at FLA. STAT. § 163.085(3)).

[698] Brevard County Regulations, Chapter 62, Article XII, Sec. 62-4212

[699] South Carolina Code of Regulations, Ch. 30: Department of Health and Environmental Control—Coastal Division, 30-1. C.(4)

[700] While this has been adopted as a policy, work is still underway by the Council to develop standards and criteria to implement this policy. PAMELA RUBINOFF, NATHAN D. VINHATEIRO & CHRISTOPHER PIECUCH, SUMMARY OF COASTAL PROGRAM INITIATIVES THAT ADDRESS SEA LEVEL RISE AS A RESULT OF GLOBAL CLIMATE CHANGE 22 (Rhode Island Sea Grant/Coastal Resources Center University of Rhode Island, February 2008), available at http://seagrant.gso.uri.edu/ccd/slr/SLR_policies_summary_Mar6_final.pdf.

The role of information and the knowledge of the public about SLR and coastal dynamics plays a critical role in many aspects of the policy making for coastal management. General public awareness of the impacts of SLR and coastal dynamics will affect the actions of purchasers of coastal property, the mortgage industry, the insurance industry, and, one can hope, state and local officials making policy. In addition, public awareness of SLR and coastal dynamics can play a key role in Fifth Amendment constitutional takings analysis.[701]

1. Developing Information Resources

Informing the public and making policies for accommodating dynamic beaches as effective and efficient as possible, we need more information. For example, the scale of mapping for the impacts of SLR and hurricane flooding needs improvement.[702]

Florida and its local governments should focus on local issues such as development of detailed, accurate maps depicting ground levels.[703] Such resources allow mapping of areas subject to inundation and increased storm surges.[704] They also may inform local and state decisions regarding infrastructure, comprehensive planning, and zoning even as they also help the public and commercial interests plan for the future. This effort requires tremendous resources. Integrating SLR into various areas of state policy may allow leveraging of funding sources to focus on the identification of hazards from SLR.[705]

As an example of an impressive undertaking of assessment, one can look to Hawaii. Hawaii's coastline is threatened by coastal erosion, tsunamis, hurricanes, sea level rise, flooding, subsidence, earthquakes, and lava flows. One objective from the Hawaii Coastal Zone Management Program (HCZMP) is to reduce the hazard to life and property from tsunami,

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[701] *See infra* Part V.A.

[702] During the 2008-09 fiscal year, Florida Sea Grant is funding a research project titled "High resolution coastal inundation mapping to enhance hurricane resiliency in Florida," which will be conducted by Sheng, Davis and Sheremet at the University of Florida.

[703] For example, the Miami-Dade Climate Change Advisory Task Force recommended this in their April 2008 recommendations. Miami- Dade Climate Change Advisory Task Force, Second Report and Initial Recommendations, recommendation A.2. (April 2008), available at http://www.miamidade.gov/derm/library/08-10-04_CCATF_BCC_Package.pdf.

[704] Ideally mapping should also predict erosion, but erosion models appear notoriously inaccurate at giving specific estimates of erosion. *See* ORRIN H. PILKEY & LINDA PILKEY-JARVIS, USELESS ARITHMETIC: WHY ENVIRONMENTAL SCIENTISTS CAN'T PREDICT THE FUTURE, Chapter Six (Beaches in an Unexpected Universe) (2007). The difficulty of assessing erosion to any greater level of specificity other than broad trends argues for use of "indicator-based" strategies.

[705] For example, it may be possible to share costs for this work with FEMA. *See* ASSOCIATION OF STATE FLOOD PLAIN MANAGERS, NO ADVERSE IMPACT: A TOOLKIT FOR COMMON SENSE FLOODPLAIN MANAGEMENT 17 (2003).

erosion, storm waves, stream flooding erosion and subsidence. Under the HCZMP, a coastal hazard atlas was developed by researchers at the University of Hawaii.[706] The Atlas depicts the intensity of seven potentially hazardous coastal processes in Hawaii including: tsunami inundation; coastal stream flooding; seasonal high waves; high winds and marine overwash; coastal erosion; SLR and volcanism and seismicity. These maps depict coastal sections, at a scale of 1:50,000, in 5-7 mile segments with color bands ranking the relative intensity of each coastal hazard at the adjacent shoreline. Each map also depicts the geology of the coast using a simple alphabetical code. Additionally, the coastal slope is mapped from sea level to an elevation of approximately 200 feet, or the first major change in slope. Both geology and slope are important variables in determining the hazardous character of the coastal shoreline.

2. Educating Purchasers Near The Beach

The bulk of Florida's population growth during the past decades has occurred at or near Florida's beaches. Unfortunately many of those coming to Florida to buy beachfront property have no idea about the dynamism of natural beaches. Many purchasers, be they from Minnesota, Ohio, or Montana, may expect the beach to remain as it was when they first viewed the property. Beaches rarely fulfill such unrealistic expectations.

In an effort to address this, the Conservation Clinic at the University of Florida Levin College of Law conducted a student project to design modifications to state statutes to require that potential oceanfront land purchasers receive notice of the erosion that might occur and the limitations to which the land is exposed due to its location on the beach if the parcel is on a beach classified as "critically eroding." This project helped give birth to Florida Law 2006-273, codified at Florida Statute section 161.57.

This law, however, could still be dramatically improved. It should be expanded to include to include notice to prospective purchasers of any property within the jurisdiction of the CCCL as expanded to account for SLR. The law could require signing, at least two business days before the closing, of a statement that the purchaser received notice (to avoid that the notice is buried in a pile of other papers) and that a copy of the notice be submitted to a DEP office to demonstrate that the property owner was aware of the dynamics of the beach-dune system.

3. Public Outreach and Education Efforts

In addition to educating owners and purchasers of land along the coast, the general public must understand coastal dynamics and the potential impacts of SLR before the public will support the policy decisions now that seem difficult in the short run but will make adaptation easier in the long run. Local and state governments should be using the information they generate on the potential impacts of SLR on the local area as the substance of a public education campaign.

Since few local governments have undertaken such action, citizens in some U.S. cities have waged a grassroots campaign to raise public awareness about sea-level rise with the

[706] Atlas available at http://pubs.usgs.gov/imap/i2761/sections/1_Intro.pdf.

"lightblueline" project. The project seeks to show the public precisely what a seven-meter[707] rise in sea level will look like by painting blue lines on the streets of coastal cities to represent the new coastline that will be created if human-induced climate change is not stopped.[708] Proponents argue that this visual representation translates scientific abstraction into a reality that people can better understand. The project asks citizens to "remember that the coastline is an outcome of our collective human efforts."[709] The volunteer-run lightblueline has so far sought to bring painted lines to the streets of six American cites: Santa Barbara, New York City, Santa Monica, Ventura, Washington, D.C., and San Francisco. The project works with local governments and would only draw the blue lines after gaining official authorization.

To date, no city government has yet fully approved the project. Activists came very close to success in Santa Barbara, when the city's the Historic Landmarks Committee voted 5-to-2 to approve plans to place a 1,000 foot long line throughout downtown Santa Barbara. Despite this approval, however, the plan was tabled by its proponents because of fierce opposition from real estate interests, who argued that the project would diminish property values seaward of the blue line and force property owners to disclose the line's meaning to potential buyers.[710]

Similar public awareness campaigns have been conducted, although lightblueline seems to be the only effort to place permanent lines on public streets. In New York City, a public, government sanctioned artwork called HighWaterLine allowed an artist to draw a blue chalk line along almost 70 miles of coastline.[711] In San Francisco, an ongoing collaborative art project called FutureSeaLevel.org places brightly colored tape at various hotspots around the city, such as public libraries and the Aquarium and the Bay.[712]

C. *Accepting Beach Dynamics: Moving Ahead By Moving Back*[713]

Some places where we have built on the beach we may seek to protect from the ocean regardless of the cost in money or ecosystem damage/loss. In many cases, however, moving development

[707] This number was chosen because it is the predicted effect of the ice on Greenland melting.

[708] http://lightblueline.org/

[709] http://www.lightblueline.org/what-lightblueline

[710] http://www.independent.com/news/2007/aug/23/white-flag-blue-line/

[711] http://www.highwaterline.org/

[712] http://www.futuresealevel.org/

[713] The terminology often used for moving human development back from beaches is "strategic retreat." We have resisted use of this terminology since the term "retreat" implies that some battle has been lost. Avoiding such emotionally laden terminology has also led to our use of the phrase "dynamic habitat accommodation" to signify that our real goal is to recognize and preserve the dynamic nature of the beach as sea turtle nesting habitat. This seems a more appropriate characterization than that of waging a war with a natural system. Any war that should be waged in this case should be waged on the widespread lack of understanding of beach dynamics and the folly of building too near the beach.

back from the beach may be the preferable policy. Relocating back from the beach, when carefully planned and executed, may cost less, be more technically feasible, better protect property and life, and better distribute the costs of moving back from the beach.[714]

Implementing policies that move development back from the beach have costs. Incurring these costs can, however, reduce other costs. First and foremost moving back from the beach can eliminate or reduce nourishment costs. In addition, moving back from the beach instead of nourishing or armoring avoids the ecosystem losses and damage that accrue due to nourishment and armoring. Little work has been done on the costs of policies to move development back from the beach; one such study assumed that nourishment would continue[715] but did not make clear what amount of sea-level rise contemplated in the study.[716] This paper concluded that nourishment would cost less than moving back from the beach over the next 50 years. Another paper suggests, however, that the cost of moving back from the beach for residential development would be an average annual cost per mile of $900,000-$1,460,000.[717] Further research should be conducted in Florida communities on the economic viability of policies to move development back from the beach.

Strategies to promote movement back from the beach should include:

- Federal, state, and local incentive plans to assist in the costs of relocation or removal
    - These could mitigate the impact of limitations on rebuilding
- Internalize costs through sales, property, and occupancy taxes on coastal development and tourism
- Accurate and scientific assessment of the true fiscal impacts of moving back from the beach as opposed to nourishment
- Develop comprehensive planning strategies

D. *Comprehensive Planning for the Beaches We Want*

Increasingly there is recognition that planning and hazard mitigation should consider the impacts of SLR.[718] Comprehensive planning has a substantial role to play in promoting the continued

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[714] ANDY COBURN AND DAVID LEWIS, AN EVALUATION OF STRATEGIC RETREAT AS A VIABLE COASTAL EROSION RESPONSE MANAGEMENT ALTERNATIVE (Program for Study of Developed Shorelines, Western Carolina University [program formerly housed at Duke University] 2004) (copy on file with principal author).

[715] George R. Parsons and Michael Powell, *Measuring the Cost of Beach Retreat*, 29 COASTAL MANAGEMENT 91, 95 (2001).

[716] *Id.* at 92.

[717] ANDY COBURN AND DAVID LEWIS, AN EVALUATION OF STRATEGIC RETREAT AS A VIABLE COASTAL EROSION RESPONSE MANAGEMENT ALTERNATIVE 17 (Program for Study of Developed Shorelines, Western Carolina University [program formerly housed at Duke University] 2004) (copy on file with principal author).

[718] HARRINGTON AND WALTON, *supra* note 19.

existence of dynamic beaches as sea-turtle nesting habitat, particularly in light of SLR. In addition to state and local jurisdiction policies discussed in the previous section, many jurisdictions have already begun the process of incorporating SLR into their planning processes.[719]

Incorporating climate change and SLR into land use plans and decision-making requires a broad perspective to account for the broadly shared risks of climate change and SLR.[720] Florida's statute integrates land-use planning with related growth decisions, such as transportation and infrastructure. Within the text of the statute, the Florida Legislature emphasizes the innovative and holistic process of comprehensive planning that will help conserve, develop, and protect natural resources and other features of the state.[721] Although none of the required or optional elements mention SLR, thinking has begun on how to integrate SLR into comprehensive planning.[722] The table below highlights the comprehensive land use plan elements that are most relevant and most amenable to including sea-level rise (SLR).

Element	Relevant Language	Observations & Recommendations

[719] *See* Appendix G for examples. A 2007 case in Australia required that development consider the impacts of climate change and sea-level rise. *See*, Sunanda Creagh, The Sydney Morning Herald, A Change in Climate for Developers, available at http://www.smh.com.au/news/environment/a-change-in-climate-for-developers/2007/11/27/1196036894092.html?page=fullpage#contentSwap1.

[720] NATIONAL RESEARCH COUNCIL, POTENTIAL IMPACTS OF CLIMATE CHANGE ON U.S. TRANSPORTATION (2008) at 122.

[721] FLA. STAT. § 163.3161(3) (2008).

[722] Statewide planning activities include the Florida Planning Toolbox, a document that describes and provides examples of planning tools designed to assist Florida communities to "protect and enhance natural resources, promote economic prosperity for all residents, and enable a sustainable quality of life." *Florida Planning Toolbox*, http://www.cuesfau.org/toolbox/about_us.asp (last visited Apr. 28, 2008). The Toolbox was prepared as part of a Department of Community Affairs grant to the Center for Urban and Environmental Solutions at Florida Atlantic University. SLR is generally discussed under the adaptation and land-use planning tools.

Coastal Mngmnt . § 163.3177(6)(g)(1)	• Objectives of element include: maintaining, enhancing, and restoring the living and non-living quality of the coastal zone environment and its resources, including biodiversity • Element seeks to limit "public expenditures that subsidize development in high-hazard coastal areas" • Develop management and regulatory techniques to achieve objective	• Most appropriate element for addressing SLR • Establish the geographic area at risk from storms and SLR • Create a "SLR Overlay" zone based on best estimates of temporal and spatial impacts of SLR; overlay will include special zoning and other considerations; coordinated with the future land use map • Redefine the "coastal high hazard area" to include the 100-year storm surge elevation *plus* an increment of elevation for SLR • Inclusion of *rolling easement* as a regulatory technique • Indirectly applies to insurance subsidies and other perverse incentives that make coastal development possible • Identify and acquire coastal properties that are located in hazardous areas
Future Land Use § 163.3177(6)(a)	• Element designates "proposed future general distribution, location, and extent" of land uses, including residential, commercial, recreation, conservation, and education • For coastal counties, this element must include "regulatory incentives and criteria that encourage the preservation of recreational and commercial working waterfronts…" • Land use map should identify beaches and shores; rivers, bays, lakes, flood plains, and harbors; and wetlands	• Prohibit new development in coastal areas and other areas vulnerable to SLR • Timeline for FLU element is crucial for planning for SLR (extend timeline of FLU element to reflect long-term SLR) • Land use map could be coordinated with SLR maps • To account for uncertainties in SLR predictions, this element could include a set of conditions that, when met, dictate a certain path of development or future land use ("indicator events")

Conservation § 163.3177(6)(d)(1)	• Element details the conservation, use, and protection of natural resources in the area, including water, water recharge areas, wetlands, estuarine marshes, beaches, shores, flood plains, rivers and other surface waterbodies, and marine habitats • For coastal counties, recreational surface water use policies should consider natural resources, manatee protection needs, and public access to water	• Could include acquisition of open, undeveloped spaces near the shoreline to conserve the area, to prevent future development, to sustain natural barrier protection, and to allow plant or animal migration
Recreation § 163.3177(6)(e)	• Element designates a "comprehensive system of public and private sites for recreation," including natural reservations, and beaches and public access to beaches	• Encourage development of parks and passive public recreation in areas threatened by SLR • Florida's unfortunate combination of permitting sea-walls and other hard structures plus erosion impacts from SLR will complicate efforts to maintain recreation areas along the coast
Capital Improvements § 163.3177(3)(a)	• Element requires consideration of the need for and location of public facilities	• Planners should consider how SLR will affect placement of public facilities, particularly those along the coast • SLR considerations for prioritizing and improving new and existing structures • Element is criticized for being "too short-range" to be a feasible means for addressing SLR adaptation[723]

[723] ROBERT E. DEYLE, KATHERINE C. BAILEY, AND ANTHONY MATHENY, ADAPTIVE RESPONSE PLANNING TO SEA LEVEL RISE IN FLORIDA AND IMPLICATIONS FOR COMPREHENSIVE AND PUBLIC-FACILITIES PLANNING 27 (September 1, 2007).

Infrastructure § 163.3177(6)(c)	• Element designates general future municipal waste and water treatment services, including what services will be needed and how to address shortages • Element must also incorporate regional water supply and alternative water supplies, projects, and conservation measures	• Prohibition on creation of new public infrastructure/facilities (except recreational areas) in the SLR overlay area • Limitations on rebuilding of public infrastructure/facilities in the SLR overlay area • Existing sewage lines should be inventoried to determine vulnerability to exposure and breakage as a result of SLR • SLR impacts on water supplies, surface and groundwater, should be considered when identifying alternative water supplies • Look beyond concurrency to consider future SLR and salt-water intrusion when evaluating new development
Transportation	• Element addresses capability to evacuate the coastal population prior to an impending natural disaster	• Temporal requirement for *impending* may significantly limit applicability to SLR • Possible to incorporate evaluation of SLR impacts through transportation surveys
Optional: Safety § 163.3177(7)(h)	• Element intended to address protection of residents and property from natural and man-made catastrophe • Element considers infrastructure protection, water supply requirements, and clearances around and elevations of structures	• Coordinate element with transportation element to ensure that population can be safely evacuated
Optional: Historic & Scenic Preservation § 163.3177(7)(i)	• Element describes programs and plans to preserve lands with scenic or similar significance	•

Florida's robust comprehensive planning law appears to be an underutilized tool to help protect Florida's beaches. Currently, few coastal counties mention SLR in their comprehensive plans. Indian River, St. Lucie, Martin, and Palm Beach have no policies related to SLR.[724] Brevard and

[724] TREASURE COAST REGIONAL PLANNING COUNCIL, SEA LEVEL RISE IN THE TREASURE COAST REGION (2005), available at www.tcrpc.org/special_projects/TCRPC%20SLR%20Report%2012-05-05.pdf.

Volusia mention sea level rise[725] but have no regulations related to a SLR policy.[726] For examples of other local governments that mention sea-level rise, see Appendix H.

One of the few instances in which Florida has directly examined the potential impacts of SLR occurs in the context of a series of reports by some of Florida's regional planning councils.[727] Several regional planning councils participated,[728] and each developed a map that categorized all lands below ten feet above sea level[729] as one of four types: 1) Protection [through armoring] almost certain, 2) Protection reasonably likely, 3) Protection uncertain, and 4) No protection. In the Treasure Coast region, which includes Indian River, St. Lucie, Martin, and Palm Beach counties, 77.0% of upland land was categorized as "protection almost certain," 6.7% as protection likely, 10.7% as protection unlikely, and only 5.6% as no protection. Thus, 16% of the coastal area in these four counties is even considered likely to have a dynamic beach that would allow for sea turtle nesting habitat in the face of sea level rise. The East Central Florida Regional Planning Council concluded that its two coastal counties—Brevard and Volusia—had 30% and 60% of their territory categorized as "protection almost certain" but also with 45% and 15% as "no protection."[730] Significantly, approximately 25% of area in each county could still fall toward either "protection almost certain" or "no protection" depending on the planning decisions of the counties.[731]

The results of this indicate support the basic principle that effective and cost-effective planning for SLR requires planning for areas long before they are subject to the impacts of SLR.[732] Many

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[725] EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL, LAND USE IMPACTS AND SOLUTIONS TO SEA LEVEL RISE IN EAST CENTRAL FLORIDA 2 (2004).

[726] *Id.* at page 57.

[727] TREASURE COAST REGIONAL PLANNING COUNCIL, SEA LEVEL RISE IN THE TREASURE COAST REGION 36-37 (2005), available at www.tcrpc.org/special_projects/TCRPC%20SLR%20Report%2012-05-05.pdf.

[728] This U.S.EPA-funded effort to create local planning resources for sea-level rise was not always welcomed. *See, e.g.* East Central Florida Regional Planning Council, Land Use Impacts and Solutions to Sea Level Rise in East Central Florida, page 42 (2004) (noting that Volusia County had no suggested changes to a draft report because the 200-year sea-level rise scenario exceeded the County's 20-year planning horizon and that the City of Daytona Beach questioned the very assumptions and process underlying the study).

[729] The elevation of ten feet was selected as the area that would be subject to periodic flooding with a sea-level rise of five feet—which was the estimated rise assumed by the study to occur over the next 200 years. East Central Florida Regional Planning Council, Land Use Impacts and Solutions to Sea Level Rise in East Central Florida, page 6 (2004).

[730] EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL, LAND USE IMPACTS AND SOLUTIONS TO SEA LEVEL RISE IN EAST CENTRAL FLORIDA 2 (2004), available at http://www.ecfrpc.org/Files/Projects/SEALEVEL_RISE_REPORT_11-04.pdf.

[731] *Id.*

[732] James G. Titus, *Rising Seas, Coastal Erosion and the Takings Clause: How to Save Wetlands and*

local government comprehensive plans contain objectives that would seem to limit coastal development,[733] but it is unclear that these are effectively implemented through the development permitting process.

The overarching policies that should guide comprehensive planning's response to SLR are largely encompassed by the recommendations of the Treasure Coast Regional Planning Council. They are:

Policy 1: Consider the impact of sea level rise in all land use amendments in coastal areas less than 10 feet in elevation.
Policy 2: Obtain detailed topographic maps showing one foot contours in the coastal zone to assist in planning for sea level rise.
Policy 3: Develop a plan to protect or relocate all critical public facilities that are located in areas projected to be impacted by sea level rise in the next 50 years.
Policy 4: Closely monitor updates to sea level rise forecasts and predictions.
Policy 5: Develop a sea level rise response plan that specifically identifies the areas where retreat, accommodation and protection will be implemented.[734]

Action under Policy 2 in some ways should precede action under Policy 1, as more detailed topographic maps indicating risk will be essential tools at other stages of planning. The amount of SLR and the certainty of it can pose problems for comprehensive planning. Comprehensive plan amendments must be based on data and analysis.[735] Many existing scientific studies, including the International Panel on Climate Change predictions, are sufficient "data and analysis" to support local government comprehensive plan amendments.[736]

Policy 1 addresses the need to consider SLR impacts in all comprehensive planning and ensure that planning strategies work together to encourage, when feasible, relocation away from the beach if or when the beach moves landward. When considering the coastal area at risk for storms, the area considered may need to extend even farther inland than 10 feet in elevation to account for some amount of SLR *combined with* significant storm surge impacts.[737] Currently

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Beaches Without Hurting Property Owners, 57 MARYLAND L. REV. 1279-1399 (1998); EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL, LAND USE IMPACTS AND SOLUTIONS TO SEA LEVEL RISE IN EAST CENTRAL FLORIDA 56 (2004) (noting that timely planning will make adjustment to sea-level rise less costly).

[733] TREASURE COAST REGIONAL PLANNING COUNCIL, SEA LEVEL RISE IN THE TREASURE COAST REGION 36-37 (2005).

[734] *Id.* at 37-38.

[735] FLA. STAT. § 163.3177(10)(e) (2007); FLA. ADMIN. CODE r. 9J-5.005(2)(a).

[736] For additional information on the need for data and analysis to support the need for comprehensive plan amendments, see Appendix I.

[737] Sea-level rise will be felt first and most acutely during extreme events such as hurricanes and high surf. Eileen Shea, director of the NOAA (National Oceanic and Atmospheric Administration) Integrated Data and Environmental Applications Center, quoted in the article "The Drowning of Hawaii",

the storm surge model used by the state uses the storm surge of a Category 1 hurricane to define the coastal high-hazard area.[738] This area should be expanded for planning purposes since rising sea levels will make the existing line outdated; waiting until the future to reset the line would mean that buildings built now may not be up to the standards necessary to withstand storm surge as the area subject to storm surge moves landward. Thus, the coastal high hazard area for planning purposes should be calculated as at least a Category 1 hurricane storm surge plus an increment of elevation for expected SLR.

Policy 1's land use amendments also include zoning, which should be reexamined in light of SLR. Zoning includes many tools useful in encouraging relocation back from moving shorelines. Before considering the suite of possible policies to apply in an area, it makes sense to categorize areas based on the feasibility of moving development back to allow for a natural, dynamic beach. In the areas where this exercise was done in Florida, most all areas with any development on private property were categorized as areas almost certain to be protected through armoring, thus leading to a loss of beaches in those areas. In part this indicates the difficulty of a local government or community imagining losing part of its territory. However hard it may be for a community and property owners to imagine losing property, we need to imagine the ecological and economic costs of destroying the beaches where development exists by building hundreds of miles of seawalls—if this is even technically possible.[739]

Good policy will require developing criteria to determine which areas are most feasible for movement. It seems some local governments may not willingly make the difficult decisions about moving out of some areas with current development. For example, part of Florida's east coast was already assessed as having as little as 16% of its beaches having the possibility of remaining dynamic. One method to overcome this would be for the state to establish a limit on the amount of armored beaches in each county or region and allow the county or region to determine how to comply. Areas already densely developed with high-rise buildings will virtually always receive protection in the short term. Areas with very dense residential or business development will also almost always receive protection as long as possible. At the other extreme, it is commonly assumed that natural areas will be allowed to be claimed by moving beaches. The crucial areas where planning efforts should focus are areas with moderate, little, or no development right now.

In such areas it is possible to utilize planning tools such as zoning, downzoning, development conditions (for example, requiring construction of buildings that can be relocated landward), exactions (i.e. for rolling easements, described below in Part IV.E.), limitations on publicly-

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Honolulu Star Bulletin, Vol. 12, Issue 266 - Sunday, September 23, 2007, available at http://starbulletin.com/2007/09/23/news/story01.html.

[738] FLA. STAT. § 161.3178(2)(h) (2007).

[739] *See* STATEMENT ON SEA LEVEL IN THE COMING CENTURY, *supra* note 90 at 4.

funded installation or repair of infrastructure,[740] setbacks, programs for purchase or transfer of development rights, limitations on rebuilding of private structures, and limitations in the capital expenditure element of comprehensive plans. These are addressed in turn.

Downzoning. *Hollywood v. Hollywood, Inc.*[741] The court in *Hollywood* upheld a drastic downzoning of part of the claimant's land while another was upzoned, and a TDR was offered as a *quid pro quo* for dedication to the city of the downzoned portion of claimant's property.[742]

Zoning. Local government zoning should be modified to ensure that areas subject to loss directly through inundation or indirectly through erosion or subject to future storm surges are either prohibited from developing or are subject to development conditions, restrictions, and exactions that assure any development that is allowed to occur will be eliminated as the shoreline approaches.

Proper zoning should prohibit certain classes of development such as industrial, those involving hazardous substances, or medical care facilities. One exception to the industrial prohibition could be water-dependent industrial uses, fishing facilities, dry docks, or water-based shipping facilities.

Not all development would necessarily have to be prohibited. For example, zoning could allow construction of single family homes in the area on the condition that the permit applicant:

1. Grant to the local government and record in public record a rolling easement to allow the beach to move;
2. Construct a house designed to be either dismantled and reconstructed or moved as a unit;
3. Demonstrate ownership of a lot outside of the area identified to be threatened by SLR within a chosen timeframe. The additional lot would have to have the space and development rights to accommodate the structure on the lot proposed for construction, and the deed to the lot would have to contain restrictions that it must be maintained for placement of the house on the more seaward lot;
4. Post a bond or give other financial assurance that the home and infrastructure will be removed from the property as the beach migrates onto the property.

Zoning might also allow flexibility for commercial development and water-dependent uses that are willing to ensure preservation of the natural beach. For example, water-dependent facilities or tourism-based businesses could be allowed provided they purchase property that allows for adjustment of the business landward for a certain amount of projected SLR. Development could also be conditioned on submission of a legally-binding plan for the development's adjustment to

[740] Establish in comprehensive plan the areas and circumstances under which public infrastructure will not be rebuilt. Property owners in such an area could choose to privately pay to reconstruct infrastructure.

[741] 432 So. 2d 1332 (Fla. 4th DCA 1983), review denied 442 So. 2d 632 (Fla. 1983).

[742] *Id.* at 1338.

movement of the beach. However, certain hazardous commercial and industrial uses should be prohibited.

Zoning should promote public and private recreational facilities, especially those like golf courses or parks that use large amounts of open area. Such uses require less infrastructure than typical residential or commercial development, thus reducing the cost of loss.

Development already in such areas should be limited in its ability to expand, renovate, or rebuild. Major expansion should be prohibited. Rebuilding or repairing valued at more than 50% of the building's cost to construct new should be prohibited.[743]

Setbacks. Setbacks for new construction are a common and very effective strategy to protect dynamic beaches. Setbacks are administratively easiest when simply established at a set distance from mean high water. For example, the countries of Aruba and Antigua have established setbacks at 50 meters (about 165 feet) from mean high water.[744]

Capital improvements and Infrastructure.[745] Basic infrastructure plays a critical role in development patterns and represents a significant cost for a community. As infrastructure expands, so will development dependent upon it. For example, in the Treasure Coast Regional Planning Council's report on SLR, Martin County commented that one area listed as "reasonably likely to be protected" was changed to "almost certain" based on the fact that the area was going to be connected to public water and wastewater. Infrastructure promotes development and is more costly to maintain in areas subject to coastal flooding and storms. Thus, comprehensive plans should make significantly stronger any existing language they have restricting infrastructure in hazardous coastal areas[746] and ensure that such policies are implemented through land development regulations. State comprehensive planning law should be modified to require that local governments prohibit capital expenditures for new infrastructure[747] in areas at risk due to SLR. One exception to this prohibition should be parks, which should actually be

[743] Goal 1, Policy 1.5.4 of the Town of Carrabelle's 2020 comprehensive plan limits redevelopment and rebuilding in the Coastal High Hazard Area.

[744] Climate Change 2001: Working Group II: Impacts, Adaptation and Vulnerability, section 6.6.2, box 6.6, available at http://www.grida.no/climate/ipcc_tar/wg2/301.htm.

[745] Florida comprehensive planning law requires local comprehensive plans to contain a "capital expenditures" element. FLA. STAT. § 163.3177(3)(a) (2007). Planning law also defines "public facilities" as "major capital improvements, including, but not limited to, transportation, sanitary sewer, solid waste, drainage, potable water, educational, parks and recreational, and health systems and facilities, and spoil disposal sites . . . ." FLA. STAT. § 163.3164(24) (2007).

[746] As an example of a local government in Florida with limitations on development of public infrastructure in some hazard areas along the coast, see the policies below Objective 4.3.1 in the Manatee County Comprehensive Plan (Coastal Management Element).

[747] "Publicly-funded" should be defined to include any infrastructure funded through Community Development Districts, special assessment levied by local government, or any other funding mechanism that involves federal, state, or local government involvement.

encouraged as appropriate, low-intensity uses. Significant repairs to public infrastructure should also be limited. For example, significant repairs might be limited to those for which those served directly by the infrastructure are willing to pay a special assessment to fund.[748] Even this option should be limited by ensuring that the majority of the properties so benefitted are not expected to be claimed by SLR within a specified time period. While such limitations will hurt some coastal property owners, they can save local, state, and federal taxpayers significant sums by avoiding the need to subsidize costly protection and rebuilding.

Water Supply. Increasingly planning is being linked to the availability of potable water supplies. SLR affects potable water supplies through salt-water intrusion. Comprehensive planning should require not only potable water availability concurrent with the development, but also require planning and financing to provide potable water for the proposed development into the future in spite of projections for salt-water intrusion into ground supplies of water.

In addition, conditions should be placed on private infrastructure. For example, coastal erosion often damages septic systems, resulting in pollution of the coastal system. After a 2006 recommendation, legislation passed that same year prohibits the Department of Health from approving a septic tank seaward of the CCCL unless the DEP has approved the proposed project[749] but does not prohibit septic tanks. This legislation does not go far enough as DEP permits houses that shortly thereafter are affected by erosion, including their septic tanks.[750] Approval of septic tanks in areas at risk from SLR should be conditioned on posting of a bond or similar assurance that the property owner will remove the septic system at a specified benchmark of beach migration.

For additional ideas and information on planning relevant to SLR considerations, see the document No Adverse Impact: A Toolkit For Common Sense Floodplain Management.[751]

E. *Rolling Easements*

A "rolling easement" is a legal tool that protects the dynamic beach from static land uses that may end up interfering with the beach as it migrates landward. Rolling easements may be part of the common law of property and codified in statute, as is the case with Texas, or they may be a separate property interest granted by the owner of the property to a third party, with or without some form of payment for the easement. The latter type of rolling easement may allow development today, but only with the explicit condition that the property will not be protected from rising water levels, thus protecting the dynamic nature of the beach."[752] A rolling easement

[748] This would constitute an exception to the prohibition on "publicly-funded" infrastructure.

[749] Laws of Florida, ch. 2006-68, sec. 4, codified at Florida Statutes section 381.0065(4).

[750] *See, e.g, supra* discussion of DEP permits GU-355 and GU-450.

[751] Published in 2003 by the Association of State Floodplain Managers.

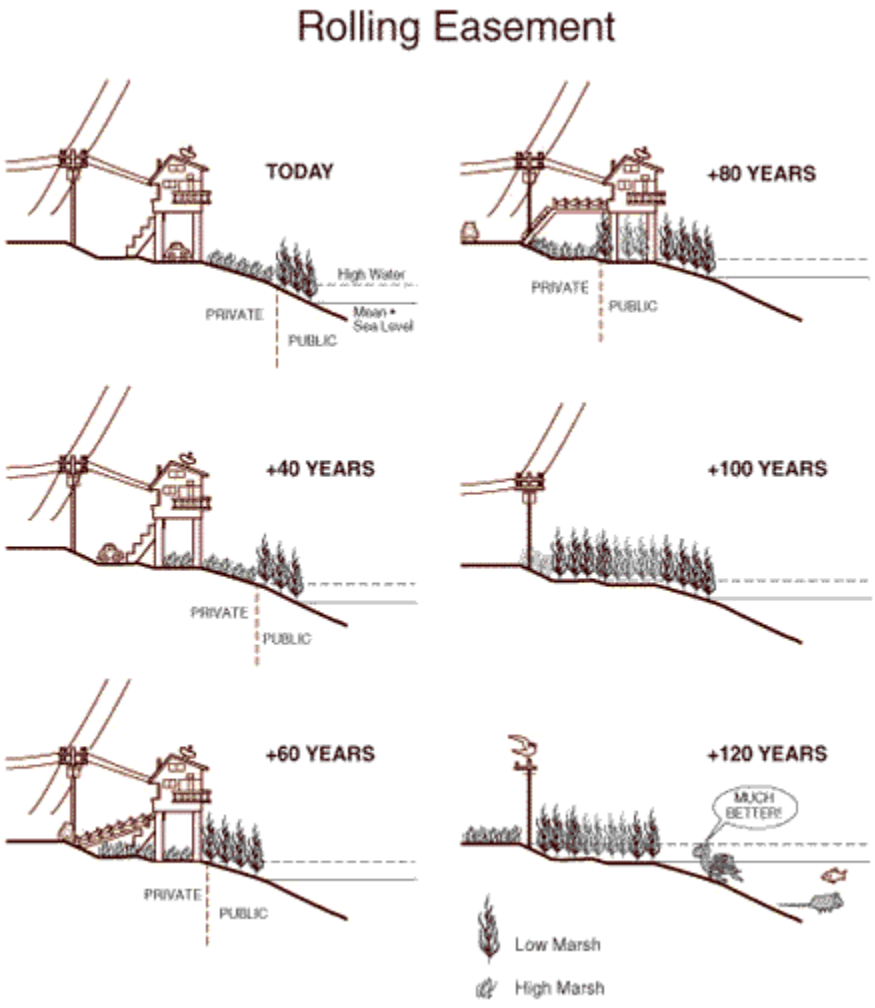
[752] Watson, Zinyowera, Moss, *IPCC Special Report on The Regional Impacts of Climate Change: An Assessment of Vulnerability* (citing James G. Titus, *Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches Without Hurting Property Owners*, 57 MD. L. REV. 1279

allows the beach to move by requiring that development that interferes with the beach be removed.

Rolling easements themselves can be implemented through a number of different land-use planning strategies. As noted earlier, a rolling easement may be part of the common law, as in Texas, but this does not appear to be a likely development in light of Florida's case law on the topic. A rolling easement, could be required to be granted to the state or local government as part of a permitting process. Exaction of a rolling easement could be appropriate in instances of construction or rebuilding in areas determined to be threatened by a specific level of SLR. The rationale supporting such a process would be that the permit could be denied due to the potential impacts of the development on the beach-dune system and environment, but that the exaction of the rolling easement will eliminate this through elimination of the development if the beach reaches the development.

A rolling easement could also, like any other property interest, be purchased. This could be done through a local government or state acquisition program, by non-profits interested in conservation, or even by private individuals.

(1998) *available at* http://yosemite.epa.gov/ee/epa/wpi.nsf/vwWPTW/A8A52939CA0C4C66852566E2005E3175/$File/takings.pdf).



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F. *Buying the Beach—Or the Ability to Develop It or Its Ability to Migrate*

The easiest solution to allowing beaches to move would be for state or local government to purchase coastal property and remove the development. At the price of today's coastal property—which is arguably inflated due to public subsidies for insurance and infrastructure—this is not feasible on a massive scale. Nonetheless, the state and local governments should identify dedicated funding sources for outright purchase of undeveloped coastal property at risk due to SLR. As an example, North Carolina has developed a system whereby local governments

[753] Diagram from James G. Titus, *Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches Without Hurting Property Owners*, 57 MD. L. REV. 1279 (1998) *available at* http://yosemite.epa.gov/ee/epa/wpi.nsf/vwWPTW/A8A52939CA0C4C66852566E2005E3175/$File/takings.pdf).

may use Community Development Block Grants to purchase property "appropriate for rehabilitation or conservation activities."[754]

At the federal level the Hazard Mitigation Grant Program (HMGP)[755] and the Flood Mitigation Assistance Program can supply funds to assist local governments in acquiring properties.[756] Communities may apply for Hazard Mitigation Grant Program funds only during a short window after an disaster, and only communities that participate in FEMA's National Flood Insurance Program are eligible for Flood Mitigation Assistance funds.

Florida's Coastal Management Act[757] states that property acquisition forms an important component of Florida's coastal zone management program[758] and specifies criteria for acquisition.[759] It is not clear how much coastal land has been purchased under this policy.[760] In a 2006 report, it was unclear how much acquisition of coastal land had taken place.[761] Florida DEP has a Coastal and Estuarine Land Conservation Program, but this was only established in 2002[762] and is only a program that allows Florida to participate in a competition for $3 million of

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[754] N.C.G.S. 160A-457(1b) (2007).

[755] The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288) is the statute governing the HMGP. Its implementing regulations are located in Title 44 of the Code of Federal Regulations.

[756] 44 C.F.R. Part 78. *See also* Federal Emergency Management Agency, Property Acquisition Handbook for Local Communities" describes the Flood Mitigation Assistance Program and the Hazard Mitigation Grant Program, available at http://www.fema.gov/government/grant/resources/acqhandbook.shtm

For example, after Hurricane Floyd struck North Carolina in 1999, North Carolina identified 1,831 structures eligible for acquisition and Hazard Mitigation Grant Program funds allowed actual acquisition of 1,531 structures. Hurricane Floyd Supplemental Mitigation funding of $172,510,409 acquisition of 2,308 eligible structures of 2,483 eligible structures identified. E-mail from Chris Crew, North Carolina State Hazard Mitigation Officer to Andrew Coburn, Associate Director, Program for the Study of Developed Shorelines, Western Carolina University, November 2007 (copy on file with principal author). Hurricane Floyd led to development of an "elevation and buyout" program, found at 44 C.F.R. Part 209.

[757] FLA. STAT. §§ 380.20 – 380.285 (2007).

[758] FLA. STAT. § 380.21(4) (2007).

[759] FLA. STAT. § 380.22(4) and (5) (2007).

[760] A 2006 report on Florida's compliance with the Coastal Zone Management Act, notes that there are currently 2,331 access sites to coastal areas, giving access to 13,970 miles. Florida Coastal Management Program, Final Assessment and Strategies: FY 2006-2010, page 2. It is unclear what the 13,970 miles listed refers to since the report earlier states that the entire coast of Florida is only 8,400 miles long. *Id.* at 1.

[761] *See*, Florida Coastal Management Program, Final Assessment and Strategies: FY 2006-2010.

[762] *See*, Coastal and Estuarine Land Conservation Program information available at www.dep.state.fl.us/cmp/programs/celcp.htm.

yearly federal funding for land acquisition.[763] Local governments have taken an active role in purchase of fee simple and other property rights.[764]

The State of Florida needs to make an independent economic commitment to acquire coastal property. Use of part of the millions of dollars dedicated to coastal nourishment each year could contribute to such a strategy.[765]

State and local governments can make their acquisition dollars go much farther with undeveloped property if they purchase only part of the property—the right to develop. The purchase of development rights could allow for minimal recreational or other facilities on the land to increase the value of the land to the private owner and reduce the cost of the development rights purchase. Purchase of development rights allows the property to remain in private hands, on the tax rolls (albeit at a lower value), and out of state ownership and management responsibility.

An option for property with or without is development is purchase of a rolling easement. A rolling easement allows the property owner to make use of the land while it is dry, but requires the owner to allow the migrating beach to overtake the land. A rolling easement's price will be directly related to the likelihood that the property will soon be inundated by the sea. If the land is already eroding at twenty feet a year and the property owner has a legal option to armor, the cost of a rolling easement may approach the cost of purchasing the property in fee simple. Substantial erosion with no possibility of legally armoring or receiving beach nourishment may make the purchase price of a rolling easement minimal since the landowner would already be resigned to loss of the land.[766] Purchase of rolling easements is best accomplished long before the ocean threatens the property as property owners will likely be willing to sell them for very little money. In fact, property owners unaware of or skeptical of SLR might sell rolling easements for even less as they could view it as free money with little risk attached.

G. *Waiver of Local Setback Requirements*

It is important to ensure that local building regulations do not interfere with desirable activities, such as relocating back from the beach. In some instances where homeowners have sought to relocate homes further from the beach, the homeowners have been hampered by road setback

[763] *See, id.*

[764] *See, e.g.* EAST CENTRAL FLORIDA REGIONAL PLANNING COUNCIL, LAND USE IMPACTS AND SOLUTIONS TO SEA LEVEL RISE IN EAST CENTRAL FLORIDA 26 (noting the acquisition programs of Brevard and Volusia Counties).

[765] The long-term costs of nourishment should be carefully assessed to determine when acquisition presents a financial feasible option.

[766] If there is no possibility to armor the property, neither the state nor local government need purchase a rolling easement since the beach will remain natural. Under this scenario, the purchase of a rolling easement serves to alleviate the suffering of the private property owner for loss of the property.

requirements that prevent them from moving their homes close to a road on the landward side of their lot. In these cases, homeowners have the added burden of seeking a variance from local setback requirements. Local governments should have an automatic—or very easy—exemption process for setback requirements for those relocating a structure back from the beach.

H. *Promoting Dynamic Beaches—A Taxing Problem*

One significant tax issue with efforts to promote dynamic beaches is how local governments are funded. Currently local governments are funded largely through property tax revenues. This gives local governments the incentive to promote maximum development near the beaches to maximize property tax revenue for the local government. Such local policy promoting excessive beach-front development seems like a rational decision for the local governments since the increased risk to people, property, the beach, turtles and other species, is not borne by the local government but falls largely on others. Costs to the environment are born by sea turtles and other species. Costs to property owners are born by a combination of the property owner and federal and state governments through subsidies for insurance, disaster relief, and nourishment. If Florida is to continue to primarily fund local government through property taxes, policy should offset this with state requirements in comprehensive planning law to ensure that local governments do not promote excessive and risk-prone development just to secure additional tax revenue. The state should also stop allowing local government to externalize the costs of excessive and risk-prone beach development promoted by the local government; this can be accomplished in part by eliminating subsidies for beach nourishment and insurance.

Local governments may also tax private properties for the costs of nourishment. This may include a lesser assessment for parcels back from the beach due to residual benefit and could include additional taxes levied on service industries that benefit from beach tourism. In addition, the state could allow coastal counties with appropriate planning and regulations to promote movement back from the beach to levy a 1.5-2% sales tax to fund the effort.[767] State funding sources for support of movement back from the beach should be allocated based on the effectiveness and comprehensiveness of the local government's program to move back from the beach.

Other tax policies may also play a role. Tax policy at the federal level should make expenses for relocation due to beach migration tax deductible (or a tax credit) and ensure that properties subject to rolling easements are viewed as depreciating assets due to their limited lifespan. For private insurance companies, eliminate the taxes on premiums dedicated to reserves for catastrophic events.[768]

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[767] ANDY COBURN AND DAVID LEWIS, AN EVALUATION OF STRATEGIC RETREAT AS A VIABLE COASTAL EROSION RESPONSE MANAGEMENT ALTERNATIVE 10 (Program for Study of Developed Shorelines, Western Carolina University [program formerly housed at Duke University] 2004) (copy on file with principal author).

[768] PIDOT, *supra* note 95 at 56.

V. Takings: Federal and State Private Property Protections

A. *The U.S. Constitution's Fifth Amendment Takings Clause*

Restrictions of armoring and other coastal construction—whether Brevard County's prohibition of armoring or Maine's regulation of coastal construction in light of anticipated SLR—have the effect of placing limitations upon the use private property. Thus, the Takings Clauses of the federal and state constitutions may come into play. Current jurisprudence indicates that restrictions on armoring will very seldom amount to takings of private property and that restrictions on building major habitable structures may or may not be, depending on the particular circumstances.

The U.S. Constitution forbids the taking of private land for a public purpose without "just compensation."[769] The government may still "take" private property, but if it does, the government must pay compensation for what it has taken.[770] For more than a century the understanding of the Fifth Amendment's prohibition on takings without compensation did not extend beyond cases involving the government taking possession of property or effectively "ousting" the property owner.[771] In 1922 this changed when the U.S. Supreme Court introduced the idea that *regulation* of private property could be so onerous as to effectively merit treatment as a physical occupation of the property or an ouster of the owner.[772] Thus, today, the "taking" of private land for a public purpose includes not only the state exercising eminent domain powers to take title to land, but also "inverse condemnation" or "regulatory takings" when government regulations become too onerous.[773] Since expansion of takings law to include regulation, courts have been plagued by the persistent problem of determining when a regulatory taking has occurred.

The first step in a takings case is determining whether the claimant indeed possessed a property right by looking to background principles of property and nuisance law.[774] If a regulation restates or reaches the same result as background principles of property or nuisance law, then no

[769] U.S. Const. amend. V. This amendment provides, in part, that "private property [shall not] be taken for public use, without just compensation."

[770] Lingle v. Chevron U.S.A. Inc. 544 U.S. 528, 536 (2005) (citing First English Evangelical Lutheran Church of Glendale v. County of Los Angeles, 482 U.S. 304, 314 (1987)).

[771] *See, e.g. id.* at 537.

[772] *Id.* at 537-38 (citing Pennsylvania Coal Co. v. Mahon, 260 U.S. 393, 415 (1922)).

[773] *See, e.g.*, Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 426-28 (1982); First English Evangelical Church v. County of Los Angeles, 482 U.S. 304 (1987); Lucas v. South Carolina Coastal Council, 505 U.S. 1003, 1028-29 (1992).

[774] Lucas v. South Carolina Coastal Council, 505 U.S. 1003, 1027-32 (1992). While the context in *Lucas* was a claim of a total taking, there is no reason why the "logically antecedent inquiry into the nature of the owner's estate" should not be applied in all takings claims. *Id.* at 1027.

taking has occurred.[775] While concepts of property have always evolved, the ability of the state to redefine property to avoid a taking has been limited since otherwise the state could always avoid a takings claim.[776] The fact that a regulation took effect prior to a claimant's acquisition of the affected property does not necessarily defeat a takings claim, but it will be considered in the overall takings analysis.[777]

Regulatory takings jurisprudence has evolved to recognize two types of cases in which a taking will be found *per se*: 1) physical invasion of property and 2) elimination of all economically viable use of land.

When the government "physically invades" or requires that a member of the public be allowed to enter the property, a taking will almost always be found, "no matter how minute the intrusion, and no matter how weighty the public purpose behind it."[778] The second type of categorical taking is "where regulation denies all economically beneficial or productive use of land."[779] A loss of all economic viability cannot be supported by simply asserting important public interests, but can be justified only where the regulation is aimed at preventing a common law nuisance.[780] The U.S. Supreme Court noted that most cases do not result in a loss of all economic viability.[781]

Most regulatory takings cases, however, do not involve either of these rules resulting in a categorical taking. Rather, most cases involve regulations that affect a property owner's exercise of certain sticks in the "bundle of rights" that comprise property ownership, thus impacting the value of the property. As Justice Holmes in *Pennsylvania Coal Co. v. Mahon* stated: "[W]hile property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking."[782] The Supreme Court has not enunciated a clear, concise test for when regulations go "too far." Instead, the Supreme Court has stated that it will engage in a case-by-case factual inquiry. This ad hoc factual inquiry first appeared in the case of *Penn Central Transportation Co. v. City of New* York.[783]

In making its "ad hoc" inquiry, the Supreme Court has identified three factors of particular importance in determining whether government action works a taking: (1) the character of the

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[775] *Id.* at 1029.

[776] *See, e.g.* Lucas v. South Carolina Coastal Council, 505 U.S. 1003, 1014 (1992) (citing Pennsylvania Coal Co. v. Mahon, 260 U.S. 393, 414-15 (1922)).

[777] *See, e.g.* Palazzolo v. Rhode Island, 533 U.S. 606, 627-30 (2001).

[778] Lucas v. South Carolina Coastal Council, 505 U.S. 1003, 1015 (1992); *see also*, Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419 (1982).

[779] Lucas, 505 U.S. at 1015.

[780] *Id.* at 1029-31.

[781] *Id.* at 1017.

[782] 260 U.S. 393, 415 (1922).

[783] 438 U.S. 14, 124 (1978).

government action; (2) the economic impact of the regulation; and (3) the extent to which the action interferes with reasonable investment-backed expectations.[784]

If the government's action can be characterized as a physical invasion of the property, a court will be more likely to find a taking.[785] If the action can be characterized as eliminating substantial rights held in property, such as the right to possess, use, and dispose of the property, and the right to exclude others, courts may also be more likely to find a taking.[786]

In analyzing whether a regulation effects a taking, courts will also consider the impact of the action on the property owner's reasonable investment-backed expectations.[787] Reasonable investment-backed expectation analysis looks at what property rights, both economic and non-economic, the regulation takes away. In *Penn Central*[788] the U.S. Supreme Court held that because a New York City landmark law did not interfere with current uses of the parcel and allowed a reasonable return on the original investment made in the property, the law did not interfere with plaintiff's investment-backed expectations.[789] The decision also noted that the regulation's stated rationale would benefit the owners of the parcel in that it "benefit[s] all New York citizens and all structures, both economically and by improving the quality of life in the city as a whole."[790] Regulation predating acquisition of the property affected by regulation is not necessarily a bar to a claim, but it will be considered when determining the claimant's reasonable investment-backed expectations.[791]

Investment-backed expectations may also be affected by other factors. For instance, does the claim involve a "highly-regulated industry"? Did the claimant know of the problems giving rise to the regulations in question when the claimant purchased the property? In takings jurisprudence, cases indicate that there are times when a takings claim will fail because the claimant either knew, or should have known, that the claimant is working in an area that is highly regulated and in which regulations are constantly changing; such change can become part of the business risk in such fields, thus fatally undermining the "reasonable, investment-backed expectations" portion of the *Penn Central* takings analysis. The most relevant example for our purposes here is the dredging and filling of wetlands.

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[784] *Id.*

[785] Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 426 (1982).

[786] Loveladies Harbor, Inc. v. United States, 15 Cl.Ct. 381, 391 (1988).

[787] Penn Central Trans. Co. v. City of New York, 438 U.S. 104, 124 (1978).

[788] *Id.*

[789] *Id.* at 136.

[790] *Id.* at 134-35.

[791] Palazzolo v. Rhode Island, 533 U.S. 606, 627-30, 632-36 (O'Conner, J., concurring) (2001). *But see* Palazzolo v. Rhode Island, 533 U.S. 606, 636-45 (Scalia, J., concurring) (2001).

In Good v. U.S.,[792] Good had purchased wetlands with awareness of the difficulty of getting permits to dredge and fill the land for development. Good was able to initially secure federal dredge and fill permits for development on his property, but many hurdles and legal struggles at the state and local levels delayed development for years. During these years, the initial federal dredge and fill permit expired, and Good secured another permit. During these years the Endangered Species Act was also passed, and the federal agency issuing Good's dredge and fill permit subsequently denied the permit it had issued based on the Endangered Species Act.[793] While the court sympathized with Good's assertion that Good could not have foreseen a permit denial twenty-one years after purchase due to a law that did not exist when he bought the land, the court emphasized that "In view of the regulatory climate that existed when Appellant [Good] acquired the subject property, Appellant could not have had a reasonable expectation that he would obtain approval to fill ten acres of wetlands in order to develop the land."[794] The court emphasized that the federal permitting agency was already making public statements about an increased need to consider fish, wildlife, and environmental concerns in its permitting process, that the state and local governments were regulating dredging and filling, and that all of this was taking place in a climate of clearly changing environmental consciousness and regulation.[795] Good's knowledge of the difficulty he faced in securing a dredge and fill permit along with the clearly changing climate for dredging and filling meant that Good knowingly took a risk in purchasing the property as dredging and filling wetlands and could not have had a "reasonable, investment-backed expectation" of receiving the necessary permits.[796]

While the *Good* court never used the phrase "highly-regulated industry," the court's references to the widespread changing regulatory environment based on a society-wide changing consciousness about environmental issues and impacts and Good's knowledge of these trends tracks the reasons that those in "highly-regulated industries" lack "reasonable, investment-backed expectations" that the regulatory regimes affecting them will not change.

Arguably the sudden shift in public awareness of sea-level rise and coastal problems currently is on the same scale as the environmental awakening beginning with *Silent Spring* and which gave birth to a host of new environmental laws and regulations in the 1970s and 1980s. Just as Good could not have had "reasonable, investment-backed expectations" of getting his dredge and fill permit, it seems reasonable to believe that coastal development—which has for decades been subject to extensive, onerous, and ever-changing—federal, state, and local regulations should be considered an area in which the "reasonable, investment-backed expectations" of property purchasers should rarely be a basis for a taking if the property owner cannot secure a permit to construct a seawall or build in an area that already subject to erosion or that is predicted to soon be underwater due to SLR.

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[792] Good v. United States, 189 F.3d 1355, 1363 (Fed. Cir. 1999), cert. denied, 529 U.S. 1053 (2000).

[793] *Id.* at 1359.

[794] *Id.* at 1361-62.

[795] *Id.*

[796] *Id.*

The most significant factor in a *Penn Central* takings analysis is the economic impact of a regulation.[797] The U.S. Supreme Court determines the economic impact of a regulation by comparing the value of the property before and after the regulation's interference with the property.[798] However, the fact that property value diminished as a result of government regulation does not necessarily amount to a compensable taking. While the Supreme Court has assiduously avoided setting a specific percentage value lost before finding a taking,[799] it has stated that land use regulation may give rise to a taking "under extreme circumstances."[800] Cases vary widely in how much loss of value will support a taking, but the loss arguably needs to be very high.[801]

Permit conditions or "exactions" are also governed by Fifth Amendment takings law. Jurisprudence on regulatory takings and exactions indicates that proper design of regulations will seldom result in valid takings claims. The high standard for a federal takings claim allows government the flexibility in conditioning permit issuance for a house on granting of a rolling easement or construction of house designed to be dismantled or relocated.[802] Similarly, denial of a permit to build seaward of the CCCL will not usually rise to the level of a compensable taking as long as such denial does not deny land owners "all economically viable use" of their property and does not interfere with land owners' reasonable investment-backed expectations to a degree requiring governmental compensation.[803] As noted above, local and state officials should be careful to point out that with today's awareness of SLR, the assumption of beach-front property purchasers that regulations will not change and that they will secure a permit to build on the beach is *not* reasonable.

Denial of armoring will very likely not result in a taking. First, landowners do not have a "property right" to armor their property. Even if an owner could claim that under a previous regulatory scheme the owner may have been eligible for armoring, the government may reasonably argue that, in light of SLR concerns, storms, and beach erosion, coastal construction is a "highly-regulated industry." In addition, the government might argue that the claimant was aware of the problem when the property was acquired, and that the change in regulatory scheme

[797] Lingle v. Chevron U.S.A. Inc. 544 U.S. 528, 540 (2005).

[798] Keystone Bituminous Coal Ass'n v. DeBenedictis, 480 U.S. 470, 497 (1987).

[799] *See, e.g.* Cienaga Gardens v. U.S., 331 F.3d 1319, 1340, 1345 (Fed. Cir. 2003).

[800] U.S. v. Riverside Bayview Homes, Inc., 474 U.S. 121, 126 (1983).

[801] *See, e.g.* Brace v. U.S., 72 Fed. Cl. 337, 357 (2006) (citing cases where no taking was found when property values were diminished 75-88%).

[802] *See generally* Nollan vs. Cal. Coastal Com'n, 483 U.S. 825 (1987); Dolan v. City of Tigard, 512 U.S. 374 (1994).

[803] Leto v. DEP, 824 So. 2d 283, 285 (Fla. 4th Dist. Ct. App. 2002).

was reasonably foreseeable. For example, the Brevard County regulations limiting construction of sea walls have not been challenged by federal takings claims.[804]

B. *Florida's Bert J. Harris, Jr., Private Property Rights Protection Act*

1. Overview

In 1995, the Florida legislature adopted the Bert J. Harris, Jr., Private Property Rights Protection Act (Act).[805] The Act created a new cause of action for landowners complaining of government interference with property rights even if the interference does not reach the level of a federal or state constitutional taking.[806] It provides that:

> when a specific action of a governmental entity has inordinately burdened an existing use of real property or a vested right to a specific use of real property, the property owner of that real property is entitled to relief, which may include compensation for the actual loss to the fair market value of the property caused by the action of government, as provided in this section.[807]

As expressed in the statute, the intent of the legislature was to create "a separate and distinct cause of action from the law of takings"[808] and to provide "for relief, or payment of compensation, when a new law, rule, regulation, or ordinance . . . , as applied, unfairly affects real property."[809]

The Act does not apply to any governmental action by the U.S. government nor any act by a Florida state governmental entity exercising powers of the U.S. or its agencies through delegation to the state.[810] It is unclear whether state and local regulatory actions pursuant to a Habitat Conservation Plan of the U.S. Fish and Wildlife Service qualify for this exemption to the

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[804] Telephone interview with Darcy McGee (Special Project Coordinator, Environmental Permitting Section, Brevard County Natural Resources Management Office). April 10, 2008.

[805] FLA. STAT. § 370.001 (2006).

[806] Holmes v. Marion County, 960 So.2d 828, 829 (5th DCA 2007).

[807] FLA. STAT. § 70.001(2) (2006). The Act does not allow for compensation for an incidental loss of market value to property that is not the subject of regulation but may have lost value due to regulations on other property. Op. Att'y Gen. Fla. 95-78 (1995).

[808] FLA. STAT. § 70.001(1) (2006).

[809] *Id.*

[810] FLA. STAT. § 70.001(3)(c), (2006). Despite wording in the Bert Harris Act noting that "[t]his section does not affect the sovereign immunity of the government," Florida Statute Section 70.001(13) (2006), Florida's Third District Court of Appeals has held that the Act does waive sovereign immunity of the government with respect to a person whose property has been inordinately burdened. Royal World Metropolitan, Inc. v. City of Miami Beach, 863 So. 2d 320, 321-23 (2003).

Act. The Act also does not apply to any law, ordinance, rule or regulation adopted, or formally noticed for adoption before May 11, 1995.[811] The amendment of an existing ordinance or comprehensive plan could fall within the scope of the Act "to the extent that the application of the amendatory language imposes an inordinate burden apart from the law, rule, regulation, or ordinance being amended."[812]

If a court determines that an inordinate burden has been imposed on the landowner, the remedy "may include compensation for the actual loss to the fair market value of the real property"[813] caused by the government's action. The Act requires that a jury determine the amount of compensation due if an inordinate burden is found.[814] The amount of compensation due is equal to the difference between the fair market value of the property prior to the governmental action, including the owner's reasonable investment-backed expectations, and the current fair market value after the governmental action, including the government's settlement offer and ripeness decision.[815] This compensation does not include business damages for development or uses which are prohibited.[816]

2. Settlement Procedure

The Act establishes a mandatory settlement procedure for disputes arising under the Act. At least 180 days before filing suit in circuit court under the Act, a landowner must give the governmental entity notice, including a valid appraisal supporting the claim of an "inordinate burden," and demonstrating the loss in fair market value to the property.[817] During the 180-day period, the governmental entity must make a written settlement offer which would resolve the claim,[818] along with a written "ripeness decision"[819] detailing permitted uses of the property.[820] The landowner may file suit in circuit court after the ripeness decision has been issued or upon the expiration of the 180-day notice period.

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[811] FLA. STAT. § 70.001(12) (2006).

[812] *Id.* The Act excludes actions by the federal government, or actions by state or local governments "when exercising the powers of the United States or any of its agencies through a formal delegation of Federal authority." FLA. STAT. § 70.001(12) (2006).

[813] FLA. STAT. § 70.001(2) (2006).

[814] FLA. STAT. § 70.001(6)(b) (2006).

[815] *Id.*

[816] *Id.*

[817] FLA. STAT. § 70.001(4)(a) (2006). Landowners affected by government action which falls within the scope of the Act have one year in which to file suit. FLA. STAT. §70.001(11) (2006). This one-year period does not begin to run until after any administrative appeals have been completed. *Id.*

[818] FLA. STAT. § 70.001(4)(c) (2006).

[819] "Ripeness decision" in this context constitutes the "last prerequisite to judicial review." FLA. STAT. § 70.001(5)(a) (2006).

[820] FLA. STAT. § 70.001(5)(a) (2003).

A settlement offer may include the following changes:

- An adjustment of land development or permit standards or other provisions controlling the development or use of land
- Increases or modifications in the density, intensity, or use of areas of development
- The transfer of developmental rights
- Land swaps or exchanges
- Mitigation, including payments in lieu of onsite mitigation
- Location on the least sensitive portion of the property
- Conditioning the amount of development or use permitted
- A requirement that issues be addressed on a more comprehensive basis than a single proposed use or development
- Issuance of the development order, a variance, special exception, or other extraordinary relief
- No changes to the action of the governmental entity[821]

Creative use of these mitigating features in efforts to protect Florida's dynamic beaches may reduce the likelihood of successful claims that the ordinance "inordinately burdens" a particular property. If the property owner rejects the government's settlement offer and ripeness decision and files suit, the circuit court judge must examine the existing use of the property[822] and determine whether the owner has an additional vested right to a specific use of the property.[823] Then, considering the proposed settlement offer and ripeness decision, the judge will decide whether the "action of the governmental entity"[824] has inordinately burdened the real property.

If the landowner accepts a settlement offer, this does not necessarily end the process. The governmental entity may implement the offer subject to certain conditions.[825] If the settlement offer "would have the effect of a modification, variance, or a special exception to the application of a rule, regulation, or ordinance as it would otherwise apply to the subject real property, the relief granted shall protect the public interest served by the regulations at issue and be the

[821] FLA. STAT. § 70.001(4)(c) (2006).

[822] "Existing use" means an actual, present use or activity on the real property, including periods of inactivity which are normally associated with, or are incidental to, the nature or type of use or activity or such reasonably foreseeable, nonspeculative land uses which are suitable for the subject real property and compatible with adjacent land uses and which have created an existing fair market value in the property greater than the fair market value of the actual, present use or activity on the real property. FLA. STAT. §70.001(3)(b) (2006).

[823] "The existence of a 'vested right' is to be determined by applying the principles of equitable estoppel or substantive due process under the common law or by applying the statutory law of this state." FLA. STAT. §70.001(3)(a) (2006).

[824] "Action of a governmental entity" is a "specific action...which affects real property, including action on an application or permit." FLA. STAT. §70.001(3)(d) (2006).

[825] FLA. STAT. § 70.001(4)(c), (d)1, (d)2 (2006).

appropriate relief necessary to prevent the governmental regulatory effort from inordinately burdening the real property."[826] Similarly, if a settlement agreement might contravene a relevant statute, the governmental entity and the property owner must file a joint action for circuit court approval of the settlement so that the circuit court can ensure that the public interest protected by the statute is still served by the settlement agreement.[827] Florida cases have not addressed a settlement in which a court concluded that the settlement did not comply with state statutes, such as would occur should a court find a settlement agreement inconsistent with other planning requirements under the Growth Management Act.[828]

3. Inordinate Burden

The most significant issue raised by the Act is often determination of what constitutes an "inordinate burden." The statutory definition describes two types of "inordinate burdens." The first is an action that directly restricts or limits the use of real property to the extent that the owner is permanently unable to attain "reasonable investment-backed expectations" for an existing use or a vested right to a specific use of the property as a whole.[829] The second inordinate burden is one in which the owner is left with "unreasonable existing or vested uses such that he bears permanently a disproportionate share of the burden imposed for the good of the public."[830] Temporary impacts and governmental actions to remediate a "public nuisance at common law or a noxious use of private property" are not included in the definition of "inordinate burden."[831]

The primary question is what degree of regulation or what diminution of value will constitute an "inordinate burden" under the statute. Reported cases have not interpreted inordinate burden.[832]

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[826] FLA. STAT. § 70.001(4)(d)1 (2006).

[827] FLA. STAT. § 70.001(4)(d)2 (2006).

[828] Two administrative cases have addressed claims of inconsistency with the Growth Management Act, but in both instances, the administrative law judge found that the proposed settlements did not violate Growth Management Act requirements. 1000 Friends of Florida, Inc. v. Dept. of Community Affairs, WL 1174557 (Fla.Div.Admin.Hrgs.), *12 (2001); Parker v. St. Johns County, 2002 WL 31846456 (Fla.Div.Admin.Hrgs.), *5+ (2002). In *Parker v. St. Johns County* the administrative law judge held that the petitioner had failed to carry her burden to demonstrate that a change to the St. Johns County Future Land Use Map, which was made pursuant to a settlement agreement under the Bert Harris Act, was contrary to the relevant provisions of the Local Government Comprehensive Planning and Land Development Regulation Act, Chapter 163, Part, II, Florida Statutes. A similar result emerged in *1000 Friends of Florida, Inc. v. Dept. of Community Affairs*, WL 1174557, *12 (Fla.Div.Admin.Hrgs.) (2001).

[829] FLA. STAT. § 70.001(3)(e) (2006).

[830] *Id.*

[831] *Id.*

[832] One case did conclude that an inordinate burden did not exist due to failure of a county to renew a lucrative special use permit. Holmes v. Marion County, 960 So.2d 828 (5th DCA 2007). Further research needs to address the hundreds of claims that have been brought under the Bert J. Harris, Jr.

While there has been a finding of inordinate burden in unreported cases, the test for inordinate burden is still not clear under the Act.

As an example of the difficulty in separating traditional takings analysis from the Act's language, one need only look to the Act's description of "inordinate burden." According to the Act, an "inordinate burden" is placed on private property whenever the owner is "permanently unable to attain the reasonable, investment-backed expectations" for the use of the property.[833] "Investment-backed expectations" were first introduced as a factor in takings jurisprudence by the United States Supreme Court in *Penn Central Transportation Co. v. New York City*.[834] However, the role this factor should play, and its relative importance, was never made clear. The use of terminology from traditional takings analysis in the Act further confuses how courts should interpret the Act. Still more confusion arises from Florida Statute Section 70.001(9), which notes that "[t]his section may not necessarily be construed under the case law regarding takings if the governmental action does not rise to the level of a taking."

A second question involves determining when "reasonable, investment-backed expectations" as to the use of land arise. One Federal Claims Court decision held that "the relevant date for determining plaintiff's historically rooted expectancies . . . [should be] the dates on which the plaintiffs themselves acquired title to their properties."[835] Where land is already subject to government regulation, a buyer's expectations concerning the property should account for this existing regulation of the property. Interpretation of reasonable investment-backed expectations should not allow recovery by land speculators who gamble against both the market and existing regulations.

The Act supports this interpretation by providing that "existing use" should mean actual present use of the land and "reasonably foreseeable, nonspeculative land uses" appropriate to the property and its surroundings.[836] Speculators who have purchased land with knowledge of existing land use restrictions should have much less success arguing that developing the land in a manner that exceeds those restrictions is a "reasonable" expectation or that land already restricted for certain uses due to environmental concerns is "appropriate" for development that is prohibited for the property and its surroundings.

At this point in the interpretation of the Act it is impossible to predict whether every diminution in value of a property as a result of future government regulation will meet this test of inordinately burdening the use of property, or whether it will be possible for some regulation to "burden" the property without that burden becoming inordinate. Those advocating increased

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Private Property Protection Act since its passage. These cases have not been published because the majority of them settle before ever reaching a courtroom.

[833] FLA. STAT. § 70.001(3)(e) (2006).

[834] 438 U.S. 104, 124 (1978).

[835] Preseault v. United States, 27 Cl. Ct. 69, 88 (1992), rev'd by Preseault v. U.S. 100 F. 3d 1525 (1996).

[836] FLA. STAT. § 70.001(3)(b) (2006).

protection of property rights interpret the Act to provide relief beginning with the loss of the first dollar of fair market value.[837] However, this argument is opposed to the traditional state court evaluation of whether government action has resulted in a regulatory taking.[838]

4. Existing Use

There are two types of "existing use" defined in the Act. The first is "an actual, present use or activity on the real property."[839] This includes "periods of inactivity which are normally associated with, or are incidental to, the nature or type of use or activity."[840] The second includes land uses which are reasonably foreseeable and nonspeculative, suitable for the subject real property, compatible with adjacent land uses, and which have created an existing fair market value in the property greater than the fair market value of the actual present use or activity.[841] This second type of "existing use" lends itself to more dispute about its interpretation.

A claimant under the Act may argue that any use permitted before a new, challenged regulation fits the definition of an inordinate burden of "reasonably foreseeable and nonspeculative [uses] which have created an existing fair market value in the property greater than the fair market value of the actual present use or activity."[842] Such an argument, however, fails to address statutory language that requires an "existing use" also must meet tests for compatibility with adjacent land uses and for suitability.[843] The test for suitability is not further defined in the statute. The best approach would be to focus on the issue of suitability of the subject property and argue that land development that would conflict with preservation of the dynamic beach system is not "suitable" development for the subject land. Such a reading properly gives the suitability test a meaning independent of the "reasonably foreseeable" requirement outlined below.

The Act's definitions of "reasonably foreseeable" and "nonspeculative" uses were intended to incorporate concepts from eminent domain valuation law.[844] In this area of law, courts will sometimes accept appraisal testimony regarding highest and best use based in part on the appraiser's determination of whether zoning changes or other land use changes were reasonably foreseeable. It is possible that a proposed land use that tracks the land's classification in the future land use element of the local comprehensive plan may be sufficient to demonstrate that the

[837] *See* Robert C. Downie, II, *Property Rights: Will Exceptions Become the Rule?*, 69 FLA. B. J., Nov. 1995, at 71.

[838] *Id.*

[839] FLA. STAT. § 70.001(3)(b) (2006).

[840] *Id.*

[841] *Id.*

[842] FLA. STAT. § 70.001(3)b (2006).

[843] *Id.*

[844] *See*, David L. Powell, et al., *Florida's New Law to Protect Private Property Rights*, 69 FLA. B.J., Oct. 1995, at 12.

proposed development is reasonably foreseeable and not speculative. Thus, in certain cases, regardless of the inclusion of an area in a sea-level rise overlay district, if the future land use classification for that area is not compatible with the purposes of the overlay district, a proposed use which matches the future land use classification may be found to be "reasonably foreseeable."[845] In these cases, the tests of "suitability" and "compatibility" from the previous paragraph will take on additional importance.

5. Vested Rights

The Act protects "vested rights" to a specific land use.[846] In order for an owner's rights to vest, Florida courts have required that four conditions be met: (1) a property owner's good faith reliance (2) on some act or omission of the government resulting in (3) a substantial change in position or the incurring of extensive obligations and expenses so that (4) that it would make it highly inequitable to interfere with the acquired right.[847]

For example, where a landowner spent substantial amounts to install water service to his land in reliance upon the existing plan that allowed multi-family housing, a county was estopped from denying building permits for the development.[848] However, courts have also held that the mere existence of a present right to a certain land use based upon a zoning ordinance is not a sufficient "act" of the government to base a vested right or equitable estoppel claim to prevent enforcement of later zoning restrictions.[849]

The Bert H. Harris, Jr. Private Property Rights Protection Act presents a significant potential hurdle to accommodation of the dynamic beach system for sea turtle nesting. State and local government regulatory changes to protect and accommodate dynamic beaches would in many instances decrease the value of existing property, leading to potential claims by property owners for relief under the Act. If such claims are successful, they could be so costly as to prevent implementation of needed measures to accommodate dynamic beaches. If the state reaches an agreement with the U.S. Fish and Wildlife Service on establishment of a state-wide habitat

[845] A property owner will have a vested right to development—and thus an excellent takings claim—if a county planning commission makes representations to a landowner and the landowner then expends substantial money in reliance on such representations. However, cases clearly state that merely purchasing property without more does not give one the right to rely on existing zoning. Monroe County v. Ambrose, 2003 WL 22900537, *2 (2003) (citing City of Miami Beach v. 8701 Collins Ave., Inc., 77 So. 2d 428 (Fla. 1955)).

[846] FLA. STAT. § 70.001(2) (2006).

[847] Monroe County v. Ambrose, 866 So.2d 707, 710 (3d DCA, 2003).

[848] Metropolitan Dade County v. Brisker, 485 So. 2d 1349, 1351 (Fla. 3d DCA 1986).

[849] Monroe County v. Ambrose, 866 So.2d 707, 711 (3d DCA, 2003) ("A subjective expectation that land can be developed is no more than an expectancy and does not translate into a vested right to develop the property"); Franklin County v. Leisure Property, Ltd. by Brown, 430 So. 2d 475, 480 (Fla. 1st DCA 1983); Jones v. First Virginia Mortgage & Real Estate Inv. Trust, 399 So. 2d 1068, 1074 (Fla. 2d DCA 1981).

conservation plan for Florida's beaches under the authority of the Endangered Species Act, it may be possible to argue that implementation of the habitat conservation plan by state and local government should be exempted from claims under the Act due to the federal authority on which the state action is based.

VI. Conclusion

Avoiding the hazard is the best way to deal with coastal hazards. Construction sited sufficiently far landward of the beach to allow for natural shoreline migration effectively minimizes coastal hazards to development, protects natural ecosystems, and reduces the multi-million-dollar yearly cost of beach nourishment and armoring. In many instances, past development patterns built too close to the beach, resulting in high losses from storms and exorbitant costs for rebuilding, armoring, and nourishing of beaches. While Florida's current CCCL permitting program has increased the safety of new structures built in the coastal zone, it fails to protect the beach-dune ecosystem, fails to account for sea-level rise (SLR), and encourages increased development due to beach nourishment. These failings have resulted in increased development subject to both immediate coastal hazards and the long-term problems of SLR.

SLR brings into question the feasibility of Florida's current focus on beach nourishment as a means to avoid the tension between development and beach migration. The CCCL program's granting of erosion credits for nourishment projects and failure to account for SLR in current permitting decisions foster development that will require protection from SLR or will be lost to the sea. In areas which are already densely developed, the incremental cost of such new development may be minimal as the area would likely already have been prioritized for shore protection from SLR anyway. However, new development in previously-undeveloped areas and increasing density in sparsely-developed areas is adding rapidly to the amount of land on Florida's coast that will receive priority for protection from SLR.

Protection from SLR in the future will exact far higher costs than we have yet seen from shore protection efforts in Florida. As the speed and magnitude of SLR increase, nourishment alone will likely not be able to keep up due to cost and lack of sand as well as the increasing energy required for nourishment. Once nourishment is no longer feasible in a developed area, two choices will remain: either armor—if this is even technically feasible—and lose the beach or move human development back from the beach and allow the shoreline to migrate. Such choices will be very difficult as the losses from either option will be tremendous.

Multiple federal, state, and local policies encourage or permit development that is or soon will be subject to severe fluctuations of the beach-dune system. While reforms are necessary in federal, state, and local insurance, comprehensive planning, disaster management and relief, and permitting policies, reforms to Florida's CCCL permitting program for coastal construction are also urgently needed to discourage new coastal construction or redevelopment in areas vulnerable to likely SLR and to ensure that redevelopment or new development that is permitted be conditioned to prevent its inclusion as justification for future armoring and loss of our beaches.

Federal and state constitutional takings law should not be seen as a bar to the federal, state, and local actions necessary to protect our dynamic beaches. Cogent legal arguments—and jurisprudence—support the idea that purchasers of coastal property do not necessarily have a right to build on the beach or receive a permit to armor on the beach. On the other hand, it is likely that Florida's Bert J. Harris Private Property Rights Protection Act presents a substantial barrier to state and local actions necessary to protect Florida's dynamic beaches as sea turtle habitat. Despite the challenge embodied by the Bert J. Harris Act, what we need more than new legal tools is the political will to face the difficult realities that our patterns of coastal development are not sustainable and begin to focus on the hard policy choices that can prevent our beaches—and all that depends on them—from washing away beneath our feet.