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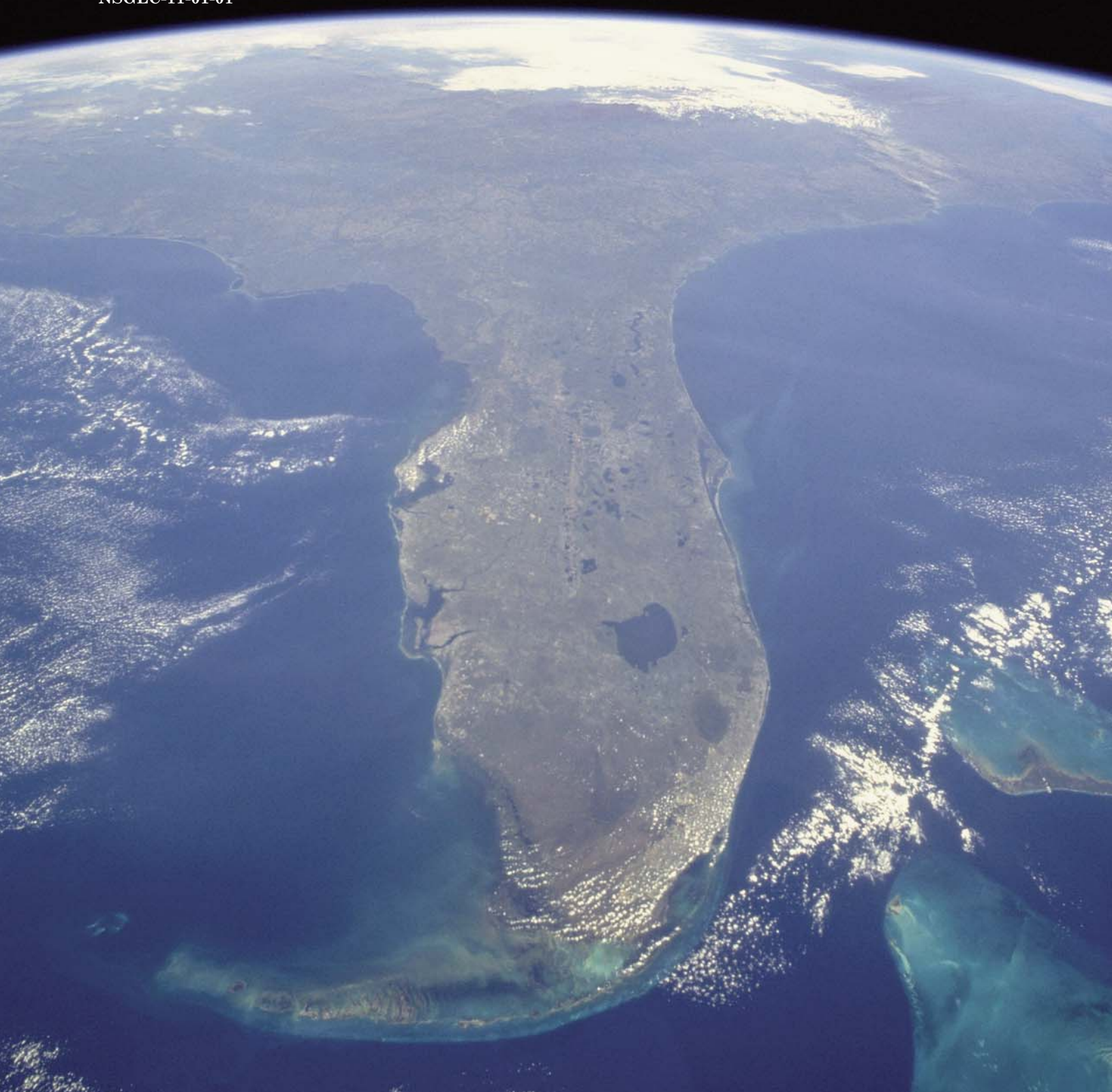

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Introduction to the Special Issue: Focus on Florida

Thomas T. Ankersen[1]

Florida, it has been said, is one big sand bar. Its peninsular land mass helps to define three globally significant water bodies, the Atlantic Ocean, the Caribbean Sea, and the Gulf of Mexico. It is young geologically. The last of the states to emerge from the water, it will be the first to return – with or without our help. In the meantime it has become home to nearly 20 million people, all of whom live in the coastal zone as defined by federal law. In Florida, a practitioner of environmental and land use law is necessarily a practitioner of marine and coastal law. Much of the work of the law in Florida is reconciling the people with their place in the coastal zone.

This edition of the Sea Grant Law and Policy Journal focuses on Florida. All but one was written by or with students in the University of Florida College of Law's Conservation Clinic. The UF Law Conservation Clinic did not begin with any explicit mandate to focus on marine and coastal law. It didn't need one. The Clinic is in Florida and in Florida most things are marine and coastal. The Clinic's work in the area of marine and coastal law has, however, led to a long-term partnership with Florida Sea Grant. Florida Sea Grant provides support to the Clinic to work with Florida's coastal communities and stakeholders on the issues that matter to them. Most of articles presented here, and described below, either resulted from applied research tied to policy products, or from the opportunity to reflect on policy products developed through the work of the Clinic.

Even though the focus is on Florida, all of the articles described below address issues of immediate concern to the broader marine and coastal legal community, something that sets this journal apart from most other law journals. Indeed, three of the articles were in progress at the time of two of the biggest disasters in global marine and coastal history – the BP Deepwater Horizon oil spill in the Gulf of Mexico and the tsunami-induced nuclear disaster in Japan – and tackle legal and policy issues that these disasters have brought to the forefront. We hope that readers will find all of these articles useful.

The Decade of the Dockominium. In middle of the first decade of this century Florida experienced a real estate boom that rivaled that of the 1920's. Always precious, Florida's water accessible real estate skyrocketed in value, along with waterfront property taxes. The twin factors of market value and exorbitant taxes relative to traditional waterfront economies led to the rapid conversion of Florida's "recreational and commercial working waterfronts" to uses inimical to public water access, especially the so-called dockominium. In his piece entitled: "Take me to the Water: Florida's Shrinking Public Access to the Waterfront and the Steps to Preserve It," Conservation Clinic student Kevin Sharbaugh, a seafarer before he was a law student and now in private practice, reviews the policy prescriptions Florida has put into place to address the loss of water access. He argues for a more nuanced approach to public water access, one that recognizes that the individual components of working waterfronts, such as boat ramps and marinas, should not be addressed with the same broad brush when designing water access protection policies. Sharbaugh also argues that preferential property tax policies to protect water access through

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changes in valuation should require binding commitments from the beneficiaries of those policies to maintain public access for longer than the current tax year.

Nuclear Power's "Wait and Sea" Approach. No coastal issue in Florida is more pervasive than the inexorable rise of the sea. In no place is coastal infrastructure at greater risk. Long before sea level rise became a pressing policy concern, Florida had built cities along the coast, and the infrastructure to sustain them – in particular, nuclear power plants that rely on large quantities of water to cool them. Now these plants appear to be in harm's way, as climate scientists predict that the flood plain will migrate landward as the land erodes around them. Moreover, new reactors are being proposed now that will continue to be operational when the trajectory of anticipated sea level rise acceleration steepens. James Choate, an LLM student in the UF Law Conservation Clinic and now an honors attorney with the U.S. Army Corps of Engineers, tackled the arcane regulatory apparatus of the Nuclear Regulatory Commission to determine the extent that sea level rise was being considered in current licensing and relicensing decisions. He concluded that it is not, at least not sufficiently. For solutions, Choate turns to the United Kingdom where the government and industry are working in tandem to address sea level rise and power plant siting. While no one expected the sea to rise 32 feet instantaneously, as it did recently in Japan, the ensuing nuclear meltdown resulting from the Japanese tsunami, has made Choate's article a timely one.

A Sea Change in Sea Grass Restoration Policy. Interdisciplinary graduate student Althea Hotaling recognized that her science-based PhD work had a strong policy component. Funded by Florida's West Coast Inland Navigation District, Hotaling is developing an estuary-wide approach to sea grass restoration that does not rely on permit-by-permit mitigation. On the advice of her advisor, the Director of Florida Sea Grant's Boating and Waterways Program, she sought out the Conservation Clinic and partnered with law student Ben Lingle, now in private practice in Georgia, to address the legal and policy feasibility of her proposed management approach. In this article, Hotaling and Lingle first review essential sea grass science before turning to the federal and state legal framework for addressing sea grass impacts. They then deconstruct the arcane method for evaluating wetland impacts in Florida, the Uniform Mitigation Assessment Methodology (UMAM), and conclude that because it was designed for traditional wetlands, it is not adequate for assessing impacts to sea grass beds. They argue that a permit-by-permit approach to sea grass mitigation may not be in the best interest of the resource. They conclude that sea grass mitigation banking could offer a viable alternative on the ecosystem scale, despite some problematic legal aspects.

Crying Over Spilled Oil. Working under the supervision of one of Florida's, and the Nation's, leading experts in ocean and coastal law, Professor Donna Christie at the Florida State University College of Law, second-year law student Alex Quimby delves into the arcane and confused realm of maritime tort law. Quimby's research presaged a key legal issue in the aftermath of the BP Deepwater Horizon Oil Spill – maritime tort liability for purely economic harm. He argues that Congress should carve out an exception to the rule against purely economic damages for specifically enumerated parties affected by oil spills only, and the federal government should explicitly preempt state law and apply the current bright line rule against purely economic losses due to maritime torts in all other instances.

U.N. Law of the Sea. Working on a Conservation Clinic project with the interagency Southeast Florida Coral Reef Initiative examining compliance with Clean Water Act permit conditions in South Florida's near shore waters, Joe Mathews came across a curious spatial gap in federal law. He discovered that one of the United States' most important environmental laws, the Clean Water Act, does not extend all of its jurisdiction to the edge of the territorial sea, as that has been redefined by the United Nations Convention on the Law of the Sea. When President Reagan signed an executive order in 1988 to conform the 3 mile United States territorial sea to the 12-mile limit now recognized by international law, Congress followed suit by amending a number of important ocean and coastal statutes, but not the CWA. In the article, Mathews describes the increasingly varied activities in offshore waters that could give rise to the types of pollution covered by the CWA, such as expanded oil and gas exploration and exploitation, ocean aquaculture and alternative ocean energy from wind, tides and geothermal sources. He then goes on to analyze the current regulatory regimes that address these activities in the territorial sea. Despite impressive coverage across a range of activities, Mathews concludes that the marine environment may be better off if the Clean Water Act also played a role. Lapses in permitting judgment by the responsible agencies in the recent Gulf oil spill illustrate this point.

Take me to the Water: Florida's Shrinking Public Access to the Waterfront and the Steps to Preserve it

R. Kevin Sharbaugh, J.D.[1]

Abstract: Florida is renowned for its waters. An extensive coastline of ocean and Gulf waters is but a part of the state's vast water resources, which include rivers, lakes, springs and innumerable wetlands. This article focuses on the loss of boating access in Florida and the state legislature's response to this growing problem. The Florida Legislature has sought to address access loss in a number of ways including through mandatory land use planning, sovereignty submerged land leasing, and property tax deferrals and other tax initiatives. After highlighting some key aspects of the access loss problem, this article outlines the major legislative and regulatory responses and some of the implementation challenges.

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I. Introduction

Florida is renowned for its waters. An extensive coastline of ocean and Gulf waters is but a part of the state's vast water resources, which include rivers, lakes, springs, and innumerable wetlands. This article will focus on the physical access to a waterbody that is needed for boating purposes, the type of access that allows one to transition from being on the land to being on the water. In 2007, this type of access allowed Florida's 18.8 million citizens[2] to collectively log an estimated 21.7 million boating trips in Florida.[3] With an estimated $8.5 billion impact on the state's economy,[4] maintaining this type of access is critical to the future well-being of both the state and its citizens.

But this access is threatened. As population density increases along the waterfront, public access points that provide citizens with boating access to public waterways face increasing demand. Concurrently, population increases and speculative market cycles lead to rising property values as the exhortation to "Buy land, they're not making anymore," is refined into "Buy waterfront" – and waterfront development responds. Consequently, privately owned, water-dependent businesses such as marinas and commercial docks used for fisheries and other marine-based work are subjected to a two-part dynamic to convert the property to residential development. First, the rapidly inflating tax burden on the property overwhelms the property owner. Second, developers interested in the conversion of the property to private residential uses offer current owners a financial incentive to sell. Upon conversion, what was once an open passage to the waterbody becomes a restricted private access point.

The current collapse of the housing market[5] provides a time to review the dynamics that lead to conversion and to consider current and potential methods to preserve and enhance public boating access in the future. Part II of this Article will highlight the problem and briefly identify the legislative response. Parts III through VI will present the multiple methods employed to address the issue. Part VII will discuss the methods presented with recommendations for additional action. Part VIII will offer a brief conclusion.

II. Recognizing the Loss of Public Access to the Waterfront

A. *Increasing Population, Decreasing Public Access*

Eighty percent of Florida's population, which has increased five-fold since 1950, lives within 25 miles of the coast.[6] As the number of people and registered boats increased, the rate of providing

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[2] Florida Legislature's Office of Economic and Demographic Research, 2010 Census Information, http://www.edr.state.fl.us/Content/population-demographics/2010-census/index.cfm.

[3] FLORIDA FISH AND WILDLIFE COMMISSION, FLORIDA BOATING ACCESS FACILITIES INVENTORY AND ECONOMIC STUDY, RFP NO. FWC 04/05-23, 108 (2009), *available at* http://myfwc.com/media/1162720/About_Econ_BAFI_Full_09.pdf (last visited Apr. 28, 2011).

[4] *Id.* at 111.

[5] Staff report, *Florida ranks No. 3 in U.S. in Foreclosure Filings*, MIAMI HERALD, Mar. 11, 2010.

[6] BRIAN C. O'NEILL, F. LANDIS MACKELLAR, & WOLFGANG LUTZ, POPULATION AND CLIMATE CHANGE ix (2001).

public access failed to keep pace.[7] This decrease in the level of service was felt throughout the recreational boating community as access to boat ramps, marinas, moorings, etc. became limited due to demand.[8] Concurrently, the supply of waterfront access was also being reduced for both recreational and water-dependent commercial working interests due to the conversion of waterfront access points from public access to private use.[9] The pressure to convert waterfront properties to private residential use was increased by the housing bubble of the early 2000's as investment flowed into the housing market, particularly the condominium sector.[10] The premium value of waterfront property attracted developers interested in converting current waterfront properties, such as marinas and commercial wharfs, into high-end condominium units with attendant private-access boat slips.[11] Property owners were presented with rapidly rising property values and, hence, taxes, on the one hand, and highly attractive financial incentives to sell, on the other hand. This dynamic compounded the pressure to convert the property to its "highest and best" use.[12]

B. The Importance of Access and the Impacts of Loss

Recognizing that public access provides long-term positive economic benefits as well as quality of life benefits for both citizens and tourists,[13] the state legislature responded to the growing problem of conversion by defining some of its components and processes. In 2004, an interim summary report on working waterfronts noted that land used for "water-dependent"[14] activities was being converted to "water-related"[15] and "water-enhanced" activities.[16] A 2004 survey by the Florida Senate's Committee on Community Affairs revealed that conversions to private access use were impacting both commercial working waterfronts as well as recreational boater access.[17]

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[7] *See generally*, The Florida Senate, Committee on Community Affairs, Interim Summary Report 2005-122 (Nov. 2004).
[8] *Id.*
[9] *Id.* at 4.
[10] *See* Parke M. Chapman, *Vultures Circle Condo Market*, NATIONAL REAL ESTATE INVESTOR, Sep. 1, 2005, http://nreionline.com/mag/real_estate_vultures_circle_condo/.
[11] Florida Senate, *supra* note 7.
[12] *Id.* at 1.
[13] *Id.* at 2.
[14] FLA. ADMIN. CODE r. 9J-5.003(137) defines "water-dependent" as "activities which can be carried out only on, in or adjacent to water areas because the use requires access to the water body for: waterborne transportation including ports or marinas; recreation; electrical generating facilities; or water supply."
[15] FLA. ADMIN. CODE r. 9J-5.003(139) defines "water-related" as "activities which are not directly dependent upon access to a water body, but which provide goods and services that are directly associated with water-dependent or waterway uses."
[16] *See*, Florida Senate, *supra* note 7.
[17] *Id.*; Will Rothschild, *Commissioners Concerned with Boaters' Access*, THE SARASOTA HERALD-TRIBUNE, April 19, 2005, at A1; Timothy J. Gibbons, *More And More Area Residents are Buying Boats, but Places to Dock them are Slipping Away*, THE TIMES-UNION, March 13, 2006, at FB-12.

C. *Legislative Response to the Loss of Access*

Through laws enacted in 2005 and 2006, the legislature responded to the loss of access by instructing local governments to address the issue on the land side through land use planning,[18] and by instructing the executive branch to address the issue on the water side through its sovereign submerged lands policies.[19] Additionally, a tax deferment program was created for recreational and commercial working waterfront properties[20] and, in 2008, the state constitution was amended[21] to allow property tax assessment of working waterfronts to be based upon current use value instead of the highest and best use of the property.

First, the legislature defined the term "recreational and commercial working waterfront" and required all local governments to address the growing loss of public access to waterways through the recreation and open space element of their comprehensive (comp) plans.[22] A "recreational and commercial working waterfront" is:

> a parcel or parcels of real property that provide access for water-dependent commercial activities, including hotels and motels ..., or provide access for the public to the navigable waters of the state. Recreational and commercial working waterfronts require direct access to or a location on, over, or adjacent to a navigable body of water. The term includes water-dependent facilities that are open to the public and offer public access by vessels to the waters of the state or that are support facilities for recreational, commercial, research, or governmental vessels. These facilities include public lodging establishments, docks, wharfs, lifts, wet and dry marinas, boat ramps, boat hauling and repair facilities, commercial fishing facilities, boat construction facilities, and other support structures over the water.[23]

In addition, the legislature required coastal counties and municipalities to incorporate "strategies" to preserve recreational and commercial working waterfronts in the coastal element of

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[18] FLA. STAT. § 163.3177(6)(e); FLA. STAT. § 163.3178(2)(g); 2005-157 Fla. Laws 4.

[19] 2005-157 Fla. Laws 5 (codified at FLA. STAT. § 253.03(15)).

[20] 2005-157 Fla. Laws 9-14 (codified at FLA. STAT. § 197.303-197.3047).

[21] FLA. CONST. art. XI, § 30 amending FLA. CONST. art. VII, § 4 to allow "for the assessment of working waterfront property based on current use."

[22] Fla. Stat. § 163.3177(6)(e).

[23] 2006-220 Fla. Laws 6 (codified at FLA. STAT. § 342.07(2)). Initially, commercial and working waterfronts were defined as:

> A parcel or parcels of real property that provide access for water-dependent commercial activities or provide access for the public to the navigable waters of the state. Recreational and commercial working waterfronts require direct access to or a location on, over, or adjacent to a navigable body of water. The term includes water-dependent facilities that are open to the public and offer public access by vessels to the waters of the state or that are support facilities for recreational, commercial, research, or governmental vessels. These facilities include docks, wharfs, lifts, wet and dry marinas, boat ramps, boat hauling and repair facilities, commercial fishing facilities, boat construction facilities, and other support structures over the water.

See 2005-157 Fla. Laws 7. The definition was modified in 2006 to include hotels and motels. Presumably this expanded definition refers to public lodging establishments that are directly associated with boat slips or ramps that are open to the public on a "first come, first serve" basis.

their comp plans.[24] Finally, coastal counties were required to create "regulatory incentives and criteria" to encourage preservation of recreational and commercial working waterfronts in the future land use element of their comp plans.[25] Concurrently, the legislature mandated that the Board of Trustees of the Internal Improvement Trust Fund (BOTIITF)[26] "shall encourage the use of sovereign submerged lands for water-dependent uses and public access."[27]

III. Responding to the Loss of Access through Land Use Planning

A. History

A brief historical understanding of the development and application of basic land use regulation and planning is helpful to understand the constraints under which local governments operate.

1. Land Regulation Authority

The rights attached to property ownership consist of more than mere possession of land. Property rights also include the right to exclude others, the right to sell the land, and the right to build something on it, that is, the right to use it.[28] A completely unrestricted use of land could lead to conflicts between adjacent landowners or between a landowner and the public at large. In response to these conflicts, the common law system developed the doctrines of private and public nuisance to establish that certain types of activities and land use are inappropriate in certain locations;[29] thus, a certain amount of land use regulation is justified.[30] Property use can be deemed a public nuisance if the activity interferes with the health, safety, welfare or morals of the public at large.[31] Nuisance actions are common law remedies that are still used to address land use conflicts.[32] However, there are major drawbacks to regulating land use through nuisance actions alone since determining whether an activity constitutes a nuisance is a reactive determination based on the site-specific conditions and is only decided after the harm has occurred.[33] This is a sub-optimal outcome for both the individual harmed and for a property owner restrained from continuing an activity that he expected was allowed.

A forward-looking means of land use regulation increases judicial efficiency and reduces the harms experienced from a nuisance activity by predetermining where certain types of development

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[24] FLA. STAT. § 163.3178(2)(g).
[25] *Id.* § 163.3177(6)(a).
[26] The Board is composed of the Governor and Cabinet. *See* FLA. STAT. § 253.02(1).
[27] 2005-157 Fla. Laws 5 (codified at FLA. STAT. § 253.03(15)).
[28] 42 FLA. JUR. 2d Property § 1 (2010).
[29] As observed by Justice Sutherland in *Euclid v. Ambler Realty Co.*, 272 U.S. 365, 388 (1926), "A nuisance may be merely a right thing in the wrong place, – like a pig in the parlor instead of the barnyard."
[30] *See, e.g.,* Bove v. Donner-Hanna Coke Corp., 236 A.D. 37, 39, 258 N.Y.S. 229 (1932).
[31] *See* Restatement (Second) of Torts § 821B (1979).
[32] *See generally* 19 Fla. Prac., Florida Real Estate § 40:2 (2009-2010 ed.).
[33] *Id.*

and activity can occur. Although various municipalities had historically[34] performed some land use regulation under the auspices of their police powers,[35] the codification of this type of regulation occurred in the 1920's through the Standard State Zoning Enabling Act (SZEA).[36] In 1926, the U.S. Supreme Court decided the seminal land use regulation case of *Village of Euclid v. Ambler Realty Company*[37] where, in response to a facial challenge on the constitutionality[38] of the zoning restrictions enacted by the village of Euclid, the Court recognized that the increasing density of population required governmental exercise of the police powers in ways that would have previously been unacceptable.[39] The Court held that "the ordinance in its general scope and dominant features ... is a valid exercise of authority."[40] Following *Euclid,* zoning enabling statutes enacted by the states, and implemented through zoning codes developed in local communities, firmly established the use of the police power through zoning as the prevailing means of land use regulation.

While unrestricted development is not permitted in the State of Florida, the unrestricted use of the police powers to control development is not permitted either. The rights of property owners in Florida are protected by the federal Constitution,[41] the State constitution,[42] and state statutes protecting private property.[43] Governments have the authority to enact land use laws and

[34] The history of proscriptive land use controls in North America can be traced as far back as the decision by the Massachusetts Bay Colony that gunpowder mills should not be located in the center of town. JAMES METZENBAUM, THE LAW OF ZONING 1 (Baker, Voorhis & Co. 1955) (1930).

[35] Police powers are those powers retained by the states and exercised for the heath, safety, welfare, or morals of the public. U.S. CONST. amend. X. The exercise of certain aspects of the police powers of the state can be delegated to local governmental bodies such as counties and municipalities. *See* 1 Am. Law. Zoning § 2:10 (5th ed.).

[36] The SZEA was developed by an advisory committee on zoning appointed by Secretary of Commerce (and later President) Herbert Hoover in 1921. The Government Printing Office published the first printed edition in May 1924, and a revised edition in 1926. A copy of the 1926 edition is available at http://www.planning.org/growingsmart/pdf/SZEnablingAct1926.pdf (last visited Apr. 28, 2011).

[37] 272 U.S. 365 (1926).

[38] Ambler Realty Company brought a facial challenge under the 14th Amendment, claiming a taking of property without due process and equal protection. To be successful, a facial challenge requires that the Court reach the conclusion that there is no use of the challenged regulation that could be constitutionally valid. An "as-applied" challenge would have required the Court to determine if the manner in which the regulation was applied to the Ambler Realty Company, in that specific instance, had been unconstitutional.

[39] *Id.* at 386-87.

[40] *Id.* at 397.

[41] Under the 14th Amendment, a state shall not "deprive any person of ... property, without due process of law." U.S. CONST. amend. XIV, § 1. Additionally, under portions of the 5th Amendment, as incorporated and applied to the states through the 14th Amendment, no person shall "be deprived of ... property without due process of law; nor shall private property be taken for public use, without just compensation." U.S. CONST. amend. V.

[42] FLA. CONST. art. I, § 9.

[43] *See* Bert J. Harris, Jr., Private Property Rights Protection Act (Fla. Stat. §70).

regulations in the best interests of the community so long as the constitutional rights of individuals are not abridged.[44] However, there are limits to the degree of regulation.

The use of the police power to regulate is distinct from the exercise of eminent domain, where land is taken from a private owner for a public purpose. A physical taking of property by eminent domain, even temporarily,[45] requires that fair compensation be paid to the owner.[46]

In 1922, the U.S. Supreme Court created the doctrine of "regulatory takings" in the case of *Pennsylvania Coal v. Mahon*.[47] A regulatory taking occurs somewhere between a non-compensable police power regulation and a compensable taking through eminent domain.[48] These distinctions are often contentious and lead to litigation over land use regulation decisions. The Supreme Court has held that "while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking."[49] Regulations which deny all economic use and render the property "valueless" will be deemed a *per se* taking unless the state authority could reach the same effect under common law nuisance proceedings.[50] A *per se* taking also occurs where a fundamental aspect of property rights is destroyed, such as where a regulation requires the owner to allow permanent physical invasion of private property for public purposes, thereby destroying the property right to exclude trespassers.[51]

In the 1980's, a national focus on private property rights developed in counterpoise to the increasing impacts of land use and environmental regulations on property owners.[52] In 1995, Florida enacted legislation which provided for private property rights protection.[53] The Bert Harris Act provides a cause of action for a landowner whose property has been "inordinately burdened" by a governmental action. [54] The standard of "inordinate burden," while not fully settled, is a lower standard than that required under the U.S. Constitution's takings doctrine. The action must

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[44] *See* Berman v. Parker, 348 U.S. 26 (1954); Miami Beach v. 8701 Collins Ave., 77 So. 2d 428 (Fla. 1955); Miami Beach v. State *ex rel.* Lear, 175 So. 537, 539 (1937) (holding that for a zoning "ordinance to be declared unconstitutional it must affirmatively appear that the restriction is clearly arbitrary and unreasonable and has not any substantial relation to the public safety, health, morals, comfort, or general welfare.")

[45] *See e.g.,* U.S. v. Pewee Coal Co., 341 U.S. 114 (1951).

[46] Kelo v. City of New London, 545 U.S. 469 (2005).

[47] Pennsylvania Coal Co. v. Mahon, 260 U.S. 393 (1922).

[48] *See generally* 27 AM. JUR. 2d Eminent Domain § 746.

[49] Pennsylvania Coal Co., 260 U.S. at 415. In *Penn Central Station*, the Court further determined how far was "too far" by using an ad hoc balancing of 1) the economic impact of the regulation on claimant; 2) the claimant's reasonable investment-backed expectations; and 3) the character of the governmental action. Penn Cent. Transp. Co. v. City of New York, 438 U.S. 104 (1978).

[50] Lucas v. S.C. Coastal Council, 505 U.S. 1003 (1992). *See also* Dade City. v. Yumbo, 348 So. 2d 392 (Fla. 3d DCA 1977) (holding that land use restrictions that leave any reasonable use of one's property are not *per se* acts of governmental taking).

[51] Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 415 (1982) (holding that the government required installation of CATV cables on plaintiff's building was a per se physical taking).

[52] *See* Ronald L. Weaver & Joni Coffey, *Private Property Rights Protection Legislation: Statutory Claims for Relief from Governmental Regulation*, in FLORIDA ENVIRONMENTAL AND LAND USE LAW TREATISE 30.2-3 (Fla. Bar 2001).

[53] FLA. STAT. § 70.001.

[54] *Id.*

inordinately burden an existing use or a vested right to a specific use of real property.[55] The statute defines "existing use" to mean "an actual, present 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 …"[56] The principles of equitable estoppel, substantive due process under common law, or state statutory law are used to determine whether a vested right exists in a particular instance.[57]

The Act requires the government party to negotiate in good faith to resolve a Bert Harris challenge to its action.[58] Successful plaintiffs in an action where the government failed to negotiate in good faith can recover litigation fees,[59] a potential outcome that local governments can ill afford and which informs decision-making.

2. Land Use Planning in Florida

Early developments in planning and zoning in Florida recognized a need for zoning regulations to be "in accordance with" a larger comprehensive plan,[60] but the explicit linkage of zoning to comprehensive planning did not occur until Florida's Local Government Comprehensive Planning and Land Development Regulation Act of 1975 (Growth Management Act).[61] The Act mandates that local governments — counties and municipalities — create and update a comp plan for future development.[62] "The plan is likened to a constitution for all future development within the governmental boundary."[63] Specific land use regulations must then fit within the broadly stated goals, objectives, and policies of the comp plan.[64] The comp plan is a textual document normally accompanied by a Future Land Use Map (FLUM) which graphically illustrates the future planned development of the community. Specific elements must be addressed in the comp plan; those elements must be internally consistent as well as consistent with each other. Additionally, land development regulations, such as zoning and permitting decisions,[65] must be consistent with the comp plan and its FLUM.[66] Government bodies involved in land use decisions include planning commissions, zoning commissions, permitting departments, city commissions, county

[55] An inordinate burden exists where "the property owner is permanently unable to attain the reasonable, investment-backed expectation for the existing use of the real property or a vested right to a specific use of the real property with respect to the real property as a whole." FLA. STAT. § 70.001(3)(e).
[56] *Id.* § 70.001(3)(b).
[57] *Id.* § 70.001(3)(a).
[58] *Id.* § 70.001(6)(c)(1).
[59] *Id.*
[60] Brian M. Seymour, *Land Use Planning and Zoning in Florida: An Overview*, in FLORIDA ENVIRONMENTAL AND LAND USE LAW TREATISE 25.1-7 (2008).
[61] FLA. STAT. § 163.3161 *et seq*.
[62] *Id.*
[63] Machado v. Musgrove, 519 So.2d 629, 632 (Fla. 3d DCA 1987).
[64] Florida courts have firmly upheld the requirements of consistency under FLA. STAT. § 163.3177(2). *See Machado*, 519 So.2d at 629, *rev. den.* 529 So.2d 694 (Fla. 1988).
[65] Seymour, *supra* note 60, at 14.
[66] *Id.* at 15-18.

commissions, and regional planning councils, to name a few.[67] The comp plan and the FLUM are amendable documents,[68] and the Department of Community Affairs (DCA) is the state land planning agency charged with reviewing proposed changes for compliance.[69] Because their future development decisions will be analyzed within the framework of their comp plan, local governments attempt to develop the language of their plans with an eye towards maximizing flexibility.[70]

As related to working waterfronts, a local government must use data and analysis in the development of the coastal management element of its comp plan.[71] Existing land uses must be inventoried, and an estimate of the needs for water-dependent and water-related development must be established.[72] Public access facilities, including marinas, boat ramps, and public docks, must also be inventoried, and the current capacity and projected need of these facilities must be analyzed.[73] Based upon the data and analysis performed, local governments are then able to employ a number of planning tools in their strategies to preserve and increase public access.

B. Development of Land Use Regulation and Planning Tools

Local land development regulations (LDRs) are the means by which the vision of the comp plan is implemented. The planning and regulation tools briefly described below can provide local governments with the means to address public access loss at the local level. However, while the DCA reviews comp plans for compliance, there is no similar systematic review of LDRs[74] to ensure that they actually implement the comp plan. This continues to be a weak link in the planning/regulatory process.[75]

1. Zoning

Zoning is an LDR that identifies and designates the type of development that will be allowed on a particular property and thus prevents the vesting of development rights that do not conform to the zoning. Zoning is a discretionary power within the boundaries established through the comp plan.[76] After adoption of the comp plan, "all development undertaken by, and all actions taken in regard to development orders by, governmental agencies in regard to land covered by such plan"

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[67] *See* FLA. STAT. § 163.3174.
[68] *See id.* § 163.3187.
[69] Florida Department of Community Affairs, http://www.dca.state.fl.us/fdcp/DCP/.
[70] *See* Richard Grosso, *Florida's Growth Management Act: How Far We Have Come, and How Far We Have Yet to Go*, 20 NOVA L. REV. 589, 597 (1996); *See* e.g., DEP'T OF CMTY. AFFAIRS, OBJECTIONS, RECOMMENDATIONS AND COMMENTS FOR LEE COUNTY AMENDMENT 10-1 5 (2009).
[71] FLA. ADMIN. CODE r. 9J-5.012(2).
[72] *Id.* r. 9J-5.012(2)(a).
[73] *Id.* r. 9J-5.012(2)(g).
[74] Grosso, *supra* note 70, at 636.
[75] *Id.*
[76] A zoning regulation that is not in accordance with the comprehensive plan is an unlawful exercise of power. *See Machado*, 519 So.2d at 632; Citrus County v. Halls River Development, 8 So.3d 413, 420 (Fla. 5th DCA 2009).

must be consistent with that plan.[77] Changes to current zoning must conform to the uses allowed by the plan and the FLUM.

Enacting zoning regulations that group similar land uses together and provide transitional zones between dissimilar land uses, such as industrial and residential, allows for orderly and coherent development.[78] Zoning can address multiple aspects of development including type of use, density and intensity, lot coverage, and setback requirements.[79]

Zoning normally identifies permitted uses, prohibited uses, and conditional uses.[80] Permitted uses are those specified uses that are clearly appropriate for the zone and are considered "permitted by right." Prohibited uses are clearly inappropriate and will not be allowed on that site unless the owner is successful in a rezoning request. A conditional use is a use that would generally be in keeping with the zoning category but requires a site-specific analysis to ensure compatibility.[81]

Zoning categories specifically focused on recreational and commercial water-dependent uses could be employed to ensure public access through recreational and commercial working waterfronts. Requirements and restrictions for this category would disallow any non water-dependent use and prevent any residential development within the zone. Another zoning category could allow for both water-dependent and water-related uses.[82] Comp plan restrictions requiring the inclusion of additional parcels of comparable land into the zoning category prior to allowing any of the currently designated parcels to be re-zoned would function as a "no net loss" requirement for that zoning category.[83]

2. Incentive Zoning

Incentive zoning provisions relax zoning restrictions by providing opportunities for the developer to build in a way that is not normally permitted as of right. This allowance is in exchange for a public benefit that would not otherwise be required.[84] Incentive zoning was first used in the late 1950's.[85] Although voluntary by design, it has not been without legal challenge.[86]

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[77] *Halls River,* 8 So.3d at 421. *See also* FLA. STAT. §§ 163.3194(1)(a), 163.3164(7).

[78] *See* 83 AM. JUR. 2d Zoning and Planning § 2.

[79] *See generally*, 1 Am. Law. Zoning Ch. 9 (5th ed.).

[80] *See* 83 AM. JUR. 2d Zoning and Planning § 156.

[81] For an example of the process for approving a conditional use, *see, e.g.* Clearwater Beach Community Church v. City of Clearwater, Case No. 89-0111, 1989 WL 644272 at 4-5 (Fla. Div. of Admin. Hrgs, July 12, 1989).

[82] For example, *see* COUNTY OF MARTIN, FLORIDA, COMPREHENSIVE GROWTH MANAGEMENT PLAN, codified through Ordinance No. 885, enacted Oct. 26, 2010 (Supp. No. 19, 12-10), §§ 4.1.B(7) and (8), *available at* http://library.municode.com/index.aspx?clientId=13591&stateId=9&stateName=Florida .

[83] *Id.* at 4.4.M.1.g.(4).

[84] MARYA MORRIS, INCENTIVE ZONING: MEETING URBAN DESIGN AND AFFORDABLE HOUSING OBJECTIVES 3-5 (APA 2001).

[85] Chicago first used incentive zoning in 1957 to stimulate skyscraper construction. In 1961, New York implemented incentive zoning to create more public spaces and to encourage conservation of historical buildings. *Id.*

[86] *See generally*, Penn Cent. Transp. Co. v. New York City, 438 U.S. 104 (U.S. 1978), Gillmor v. Thomas, 490 F.3d 791 (10th Cir. 2007), and Holmdel Builders Ass'n v. Holmdel, 121 N.J. 550 (N.J. 1990).

However, so long as the goals and definitions regarding the specific public amenities desired and the types of development involved are clearly laid out in the ordinance implementing the incentive zoning scheme, the legality of this type of land use regulation is generally upheld.[87]

Incentive zoning can be applied in the context of developing or maintaining public access to the waterway where waterfront land use is subject to conversion to multi-family residential use, i.e. condominiums. By establishing allowable density levels at a moderate level, higher density development can then be granted in exchange for some public benefit offered by the developer. This public benefit, such as public access, could allow for continuing access to the waterway at the site, or the benefit could be supplied by a new access point nearby.

3. Zoning Overlay District

Overlay zoning districts are districts where additional regulations are imposed as performance standards over and above the standard development regulations of the underlying district.[88] Preexisting zoning categories allow for the various types of land use identified in those categories. The zoning overlay then adds additional restrictions that apply across the underlying categories in order to protect a particular feature or promote a particular type of development.[89] This tool is applicable for waterfront development. The local government has a degree of discretion as to where to draw the boundaries of the district but must then ensure that similarly situated properties are treated similarly.[90] Thus, a "waterfront district" composed of properties of various zoning categories may have an overlying zoning regulation requiring that the uses on the properties be water-dependent.

4. Moratoria

A development moratorium is a period during which authorization for a particular type of development is suspended.[91] This temporary suspension allows time for the local government to analyze current development conditions and determine appropriate actions to address problematic issues. New land development regulations can then be drafted and implemented.[92] The moratorium is then lifted and development is allowed to proceed under the terms and conditions of the newly implemented regulations.

In 1987, the U.S. Supreme Court held in *First English Evangelical Lutheran Church of Glendale v. County of Los Angeles,* that a landowner could raise a claim for just compensation for a regulatory

[87] Use of incentive zoning is specifically mention in FLA. STAT. § 163.3202(3) ("encourag[ing] the use of innovative land development regulations which include provisions such as transfer of development rights, incentive and inclusionary zoning …").
[88] 3 Rathkopf's The Law of Zoning and Planning § 61:15 (4th ed.) (2010).
[89] *See* A-S-P Associates v. City of Raleigh, 258 S.E.2d 444 (N.C. 1979).
[90] *Id.* at 452.
[91] *See* 1 Am. Law. Zoning § 6:24 (5th ed.); 4 Am. Law. Zoning § 34:3 (5th ed.).
[92] 4 Am. Law. Zoning § 34:3 (5th ed.).

taking that was temporary in nature.[93] However, the Court stopped short of making a determination as to whether the moratorium at issue actually constituted a regulatory taking.[94] Subsequently, the Court directly ruled on the moratorium issue in *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency.*[95] Here, the Court noted the importance of moratoria in the planning process and held that the *ad hoc* takings test identified in *Penn Central*[96] was the appropriate test to use in takings cases.[97] While not clearly defining the limits of moratoria use, the Court suggested that a duration exceeding one year may be suspect.[98] Along with a clear, limited duration, the ordinance establishing a moratorium should specify the development problem necessitating the temporary suspension of development activity so that the enactment of the moratorium can be shown to substantially advance a legitimate state interest.[99]

In sum, a moratorium provides planning time during which development is suspended. In the absence of a moratorium, the local government cannot delay consideration of permit applications that might conflict with proposed or anticipated changes to the comp plan and FLUM.[100] In the context of working waterfronts, a moratorium is a relatively quick and efficient means of temporarily maintaining the status quo in response to a rush to convert, and it provides the time for a planned response to the loss of access.

5. Exactions, Dedications, Impact Fees

The use of exactions is a means to require that new development pay for its share of the cost of the current and future public infrastructure that it will use.[101] Exactions are an agreement by the developer to surrender certain property rights in exchange for the rights to develop.[102] The property surrendered can be real property or a cash payment,[103] commonly referred to as an "impact fee."

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[93] 482 U.S. 304 (1987). Notice the contrast between this doctrine under federal takings law and Florida's Bert J. Harris Act. A compensable claim under Bert J. Harris requires that the government action permanently burden the property; temporary burdens, such as a moratorium with a clearly defined duration, are presumably not subject to claims under Burt Harris. *See* FLA. STAT. § 70.001.

[94] On remand, the California Supreme Court held that the moratorium was a valid exercise of the police power because its purpose was to protect public safety. First English Evangelical Lutheran Church v. County of Los Angeles, 258 Cal. Rptr. 893 (Cal. App. 1989).

[95] 535 U.S. 302 (2002).

[96] Penn Central Trans. Co. v. City of New York, 438 U.S. 104 (1978). *See* note 49 *supra*.

[97] *Tahoe-Sierra*, 535 U.S. at 321.

[98] *Id.* at 341. Although the Court states that "it may be true that a moratorium lasting more than a year should be viewed with special skepticism," the Court goes on to find that, based on the facts in the instant case, a 32-month moratorium was not unconstitutional.

[99] *See* 535 U.S. 302 at 314 (citing the district court that "regulation will constitute a taking when either: (1) it does not substantially advance a legitimate state interest; or (2) it denies the owner economically viable use of her land.")

[100] *See* Gardens Country Club, Inc. v. Palm Beach County, 590 So.2d 488 (4th DCA 1991).

[101] *See* 2 Am. Law. Zoning § 16:8 (5th ed.).

[102] *Id.*

[103] FLA. ADMIN. CODE r. 9J-5.0055(9).

The improper exaction of property concessions from subdivision developers will constitute a regulatory taking.[104] Relevant Florida case law regarding exactions holds that dedication or impact fees are valid so long as there is a rational nexus between "the need for additional capital facilities and the growth in population generated by the subdivision" and a rational nexus "between expenditures of the funds collected and the benefits accruing to the subdivision."[105] In the context of working waterfronts, exactions can be used to provide the public facilities for waterfront access needs that the new development creates. Thus, recreational access may be addressed through exactions but exactions for commercial working waterfronts would likely be challenged.

6. Concurrency

One of the fundamental requirements of Florida's comprehensive planning regime, concurrency, exists where "the necessary public facilities and services to maintain the adopted level of service standards are available when the impacts of development occur."[106] A "Concurrency Management System" is "the procedures and/or process that the local government will utilize to assure that development orders and permits are not issued unless the necessary facilities and services are available concurrent with the impacts of development."[107] The public facilities and services subject to the requirements of concurrency are: "Sanitary sewer, solid waste, drainage, potable water, parks and recreation, schools, and transportation facilities, including mass transit."[108]

As noted in section II.C. above, the legislature directed that the loss of public access to waterways be addressed, in part, through the recreation and open space element.[109] Concurrency requirements mandate that the acreage for parks and recreation facilities to serve new development "shall be dedicated or be acquired by the local government prior to issuance by the local government of a certificate of occupancy ..., or funds in the amount of the developer's fair share shall be committed no later than the local government's approval to commence construction."[110] If a broad concept of concurrency is applied to the amount of parks and recreation facilities available, then an acre is an acre. If concurrency is specifically applied to the various types of parks and recreation facilities available, then all acreage is not created equal, especially acreage that gives access to the water. Discriminating between the types of parks and recreation facilities available would hold new development responsible for the increasing demand for public access to the water.

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[104] Nollan v. Cal. Coastal Comm'n, 483 U.S. 825, 834 (1987) (holding that there must be a nexus between the condition of a regulation and the public interest purpose that the regulation is supposed to serve).
[105] Hollywood, Inc. v. Broward County, 431 So.2d 606, 611-12 (1983); In *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994), the U.S. Supreme Court held that the exaction must have a "nexus" between the government interest and the property right given in consideration and that there be a "rough proportionality" between the property surrendered and the impact of the proposed development.
[106] FLA. ADMIN. CODE r. 9J-5.003(25).
[107] *Id.* r. 9J-5.003(26).
[108] FLA. STAT. § 163.3180(1)(a).
[109] 2005-157 Fla. Laws 1-4.
[110] FLA. STAT. § 163.3180(2)(b).

7. Level of Service Standards

In order to determine whether there is sufficient public facilities and services to meet the demands of new development, an ongoing inventory and assessment of surplus must be maintained and gauged against the size of new demands. A certain level of quality is necessary for the service or good to be effective. These issues are addressed by identifying a level of service standard (LOSS) for the particular public infrastructure. Level of service (LOS) is "an indicator of the extent or degree of service provided by, or proposed to be provided by, a facility based on and related to the operational characteristics of the facility. Level of service shall indicate the capacity per unit of demand for each public facility."[111]

The Concurrency Management System set forth in Florida Administrative Rule 9J-5.0055 requires that local governments adopt LOSS for public facilities and services.[112] These LOSS are then used to guide decisions regarding the issuance of development orders and development permits.[113] The rule cross-references to other rules in 9J-5 that give specific guidance for the public facilities and services for which LOSS must be adopted, which include roads, sanitary sewer, solid waste, drainage, potable water, and parks and recreation.[114] The cross-referenced rule pertaining to parks and recreation[115] has been deleted from the code based on an analysis by the DCA that determined that "this language was unnecessary in rule because the requirement is adequately addressed in section 163.3177(6)(e), F.S."[116] Section 163.3177(6)(e) states in relevant part: "[T]he comprehensive plan shall include the following elements: ... A recreation and open space element indicating a comprehensive system of public and private sites for recreation, including, but not limited to, natural reservations, parks and playgrounds, parkways, beaches and *public access to* beaches, open spaces, *waterways*, and other recreational facilities." (emphasis added).

It is unclear whether a LOSS for Parks and Recreation as mandated under Rule 9J-5.0055 is to be based upon the aggregate number of acres or for each of the individual categories of the enumerated items in § 163.3177(6)(e). Elsewhere, Florida Administrative Rule 9J-5.005(3) provides that "Level of service standards shall be set for each individual facility or facility type and not on a systemwide basis,"[117] so arguably LOSS must be set for each of the enumerated categories. However, current practice is to set the LOSS for Parks and Recreation as a number of undistinguished acres per unit of population.[118] Additionally, the term "waterways"[119] is particularly vague and, even though the insertion of the term was specifically done by the 2005 legislation "to encourage the preservation of recreational and commercial working waterfronts;

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[111] FLA. ADMIN. CODE r. 9J-5.003(62).
[112] *Id.* r. 9J-5.0055(1)(a).
[113] *Id.* r. 9J-5.0055(2)(a).
[114] *Id.* r. 9J-5.0055(2)(a)(1) – (9).
[115] FLA. ADMIN. CODE r. 9J-5.014(3)(c)4.
[116] In 2007, a Notice of Deletion was sent to the federal Office of Ocean and Coastal Resource Management's for approval of the inclusion of the changes to FLA. ADMIN. CODE r. 9J-5 into the approved Florida Coastal Program. Copy of Notice on file with author.
[117] FLA. ADMIN. CODE r. 9J-5.005(3).
[118] *See, e.g.*, Escambia County Code of Ordinances Sec. 12.03, Objective 12.A.4.9 (Level of Service Standards), *available at* http://www.municode.com/library/clientCodePage.aspx?clientID=5813.
[119] The term is not defined under the definitions provided in FLA. ADMIN. CODE r. 9J-5.003.

including public access to waterways,"[120] it remains unclear whether specific LOSS for publicly provided boat ramps or marina slips are mandated by statute or rule. Given the level of guidance provided for developing LOSS for the other public facilities and services listed in rule 9J-5.0055, further guidance regarding LOSS for public access is warranted.

IV. Addressing Loss of Access through Sovereignty Submerged Lands Leasing Policies[121]

When considering an access point between land and water, the nature of the title and the regulation of the use of the land beneath the water should be taken into account. The title to lands under navigable waters, including beaches below mean high water lines, is held by the state of Florida, by virtue of its sovereignty, in trust for all its citizens. Sale of such lands may be authorized by law, but only when in the public interest. Private use of portions of such lands may be authorized by law, but only when not contrary to the public interest.[122]

While many government entities hold title to public lands, only the state holds title to sovereign lands (any portions that have been alienated, such as through a sale, are no longer referred to as sovereign).[123] When it was admitted to statehood in 1845, Florida obtained title to sovereign submerged lands (SSL), less those Spanish land grants specifically ratified by the Treaty of Cession,[124] as part of its sovereign political rights under the Equal Footing Doctrine.[125] Prior to the development of roads and other infrastructure, the value and importance of the state's navigable waters for transportation, commerce, and marine industry was a significant and necessary public good.[126]

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[120] 2005-157 Fla. Laws 1, 4.

[121] Sovereignty submerged lands are statutorily defined as "... lands waterward of the ordinary or mean high water line, beneath navigable fresh water or beneath tidally-influenced waters, to which the State of Florida acquired title on March 3, 1845, by virtue of statehood, and which have not been heretofore conveyed or alienated." FLA. ADMIN. CODE r. 18-21.003(61).

[122] FLA. CONST. art. X, § 11.

[123] The Florida Supreme Court highlighted the special status of sovereign submerged lands compared to other publicly owned lands, in that "Sovereignty lands are for public use, 'not for the purpose of sale or conversion into other values, or reduction into several or individual ownerships.'" Coastal Petroleum Company v. American Cyanamid Company, 492 So. 2d 339, 342 (Fla. 1986).

[124] Adams–Onís Treaty of 1819; formally titled the Treaty of Amity, Settlement, and Limits, Between the United States of America and his Catholic Majesty, U.S.-Spain, February 22, 1819, 8 Stat. 252.; sometimes referred to as the Florida Purchase Treaty. For example, the city of St. Augustine holds title to submerged lands under a Spanish land grant. However, this is exceptional and not the general rule with SSL title.

[125] *See* Pollard's Lessee v. Hagan, 44 U.S. 212, 230 (1845) (holding that "the shores of navigable waters, and the soils under them, were not granted by the Constitution to the United States, but were reserved to the [original] States respectively" and therefore, under Article IV, Section 3, Clause 1 of the U.S. Constitution, "new States have the same rights, sovereignty, and jurisdiction over this subject as the original States.").

[126] "[I]t is well settled in Florida that the State holds title to lands under tidal navigable waters and the foreshore thereof (land between high and low water marks). As at common law, this title is held in trust for the people for purposes of navigation, fishing, bathing and similar uses. Such title is not held primarily for purposes of sale or conversion into money. Basically it is trust property and should be devoted to the fulfillment of the purposes of the trust, to wit: the service of the people." Hayes v. Bowman, 91 So.2d 795, 799 (Fla. 1957).

The title to SSL is held in public trust and the use of the trust property is managed by the Governor and Cabinet sitting as the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees).[127] The Board of Trustees determines whether a use of SSL, through lease or conveyance, will be allowed.[128] Where applicable, the Board of Trustees has delegated certain aspects of review and decision-making authority to the Secretary of the Department of Environmental Protection (DEP), the Commissioner of Agriculture, and the Governing Boards of four out of the five Water Management Districts.[129] However, this delegated authority is specifically limited with respect to the permitting of docking facilities. Docking facilities with more than 50 slips or 50,000 square feet, and certain expansions of existing facilities, are beyond the authority delegated and, therefore, jurisdiction has been retained by the Board of Trustees.[130]

Additionally, the Board of Trustees retains direct authority over applications for an exception to the limits on the amount of sovereignty submerged lands that a private residential multi-family dock (i.e. condominium) can preempt.[131] For example, the SSL management policies limit private residental multi-family docks to a 40:1 preempted area to shoreline ratio.[132] To obtain an exemption from this ratio, five conditions must be met, including that the applicant provide "a net positive public benefit," acceptable to the Board of Trustees, to offset the increase in the preempted area.[133] Some "positive public benefits" explicitly suggested by the rule include: increased public access to sovereignty submerged lands by offering a number of "first come, first served" boat slips, establishing a public boat ramp, expanding an existing boat ramp, or "other similar public benefits that serve to maintain or increase public access to sovereignty submerged lands."[134]

The Florida Legislature has emphasized its intent that the Board of Trustees "shall encourage the use of sovereign submerged lands for water-dependent uses and public access."[135] This is accomplished through a lands management program that includes a leasing framework.[136] While some activities of waterfront owners can preempt a defined amount of SSL without triggering the requirement to obtain a lease,[137] leases are required for large structures.[138] Leases for the use of SSL

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[127] FLA. STAT. § 253.03.

[128] There is a strong public policy presumption against the implied conveyance of SSL. *See Coastal Petroleum Company*, 492 So. 2d at 343.

[129] FLA. ADMIN. CODE r. 18-21.0051 delegates the authority to review and take final agency action on applications to use sovereignty submerged lands when the application involves an activity for which that agency has permitting responsibility. The Northwest Florida Water Management District is the only WMD not granted this authority over sovereignty submerged land leases.

[130] FLA. ADMIN. CODE r. 18-21.0051(2).

[131] "Preempted area means the area of sovereignty submerged lands from which any traditional public uses have been or will be excluded by an activity, such as the area occupied by docks, piers, and other structures …" FLA. ADMIN. CODE r. 18-21.003(45).

[132] FLA. ADMIN. CODE r. 18-21.004(4).

[133] *Id.* r. 18-21.004(4)(b)(2).

[134] *Id.* r. 18-21.004(4)(b)(2)(e).

[135] 2005-157 Fla. Laws 5 (codified at FLA. STAT. § 253.03(15)).

[136] *See* FLA. ADMIN. CODE, Chapter 18-21, Sovereignty Submerged Lands Management.

[137] FLA. ADMIN. CODE r. 18-21.005. Non-revenue generating uses may qualify for consent by rule or a letter of consent based upon factors such as the type of use and the size of the construction compared to the linear footage of the waterfront owned. *Id.*

are of limited term[139] and are charged an annual rate.[140] A marina can receive substantial discounts on its lease fees by providing at least 90% of its slips to the public on a "first come, first serve" basis[141] and for being designated as a "clean marina."[142] Significantly, the sovereignty submerged lands management program identifies the category of "private residential multi-family dock or pier"[143] in its leasing structure and provides for a one-time premium charge[144] to be levied against them. The premium is calculated by multiplying the standard annual lease rate by a value of three.[145]

V. Addressing Loss of Access through Property Tax Deferral

The 2005 legislation provided a means for ad valorem tax relief for owners of recreational and commercial working waterfront property.[146] The tax deferral program is voluntary, but local governments choosing to participate must adopt an ordinance defining "the percentage or amount of the deferral and the type and location of working waterfront property … for which deferrals may be granted."[147] Local governments implementing the ordinance are only authorized to defer the taxes they would ordinarily collect; they cannot authorize the deferral of taxes owed to another taxing authority.[148]

A property owner applying for the tax deferral must annually file an application for the deferral with the county tax collector.[149] Upon approval, the tax collector will refrain from collecting from the property owner the amount of tax allowed to be deferred.[150] The deferred tax from that year, and successive years, accumulates against the property. Interest also accrues against the deferred taxes.[151] If property ownership changes, or the type of property use changes in a manner that no longer allows the owner to qualify for the deferment program, the total amount of deferred taxes and interest for all previous years becomes due and payable.[152] Additionally, if "the total amount of

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[138] *Id.* Docks, piers, boat ramps, etc. that preempt more than 10 square feet of SSL per linear foot of waterfront (riparian) shoreline are not eligible for consent by rule or letter of consent and will require a lease.
[139] *Id.* r. 18-21.008(1), (2)(a). A standard lease is for 5 years, but a marina that provides at least 90% of its slips to the public on a "first come, first served" basis is given a standard lease of 10 years. An extended term lease for up to 25 years is available under certain circumstances.
[140] *Id.* r. 18-21.011(1)(a), (b). Effective March 1, 2007, the annual rate charged is 6% of annual income, the base fee of $0.1413 per square foot of preempted area, or the minimum annual fee of $423.89, whichever is greater.
[141] *Id.* r. 18-21.011(1)(b)(2). Thirty percent discount provided.
[142] *Id.* r. 18-21.011(1)(b)(13).
[143] *Id.* r. 18-21.003(47).
[144] *Id.* r. 18-21.011(1)(c).
[145] *Id.*
[146] 2005-157 Fla. Laws 9-14 (codified at FLA. STAT. § 197.303-197.3047).
[147] FLA. STAT. § 197.303(3).
[148] *Id.* § 197.303(4).
[149] *Id.* § 197.304(1).
[150] *Id.* § 197.304(2).
[151] *Id.* § 197.304(4).
[152] *Id.* § 197.3043(1).

deferred taxes, interest, and all other unsatisfied liens on the property exceeds 85%"[153] of the property's assessed value, the amount of debt over 85% of the assessed value is "due and payable within 30 days after … notice."[154] Property owners failing to pay the amount due will become delinquent for "the total amount of deferred taxes and interest."[155] Finally, the deferred tax and interest constitutes a prior lien on the property and will be collected as any other tax lien.[156] This puts the local government's claim for payment of the deferred taxes superior to other liens such as a mortgage.

By the spring of 2010, only two counties and three municipalities had enacted tax deferral ordinances for recreational and commercial working waterfront properties.[157] Neither Palm Beach County[158] nor Volusia County had received any applications to the program.[159] Manatee County had two working waterfront properties apply for the deferral in the 2006 tax year. Both were approved. However, the mortgage companies discovered the unpaid, deferred taxes, and required the property owners to immediately pay the taxes.[160]

VI. Addressing Loss of Access through a Constitutional Amendment to Reduce Tax Burden

The most recent action to provide tax relief to owners of working waterfront property came in the form of a constitutional amendment in November 2008. The assessment of value for taxation purposes is conducted in accordance with regulations promulgated by the state's Department of Revenue (DOR). The DOR is charged with securing a just valuation of all property for the purpose of ad valorem taxation.[161] Article VII of the Florida Constitution identifies certain types of property that will be assessed solely on its character or current use in contrast to its "highest and best" use. Before November 2008, the state had previously recognized agricultural land, conservation land, and historic property, among others, as lands that should be assessed based upon character or current use.[162] This lower tax burden reduces the pressure for premature conversion of these types of property. In 2008, the state's Taxation and Budget Reform Commission proposed the inclusion of working waterfronts in the types of property assessed on

[153] *Id.* § 197.3043(3).
[154] *Id.*
[155] *Id.*
[156] FLA. STAT. § 197.304(5).
[157] A statewide cross-code search on Municode conducted on March 22, 2010 revealed that ordinances had been adopted by Palm Beach and Manatee counties and the municipalities of Ponce Inlet, Clearwater, and Islamorada. Municode is an online repository for municipal codes and is available at http://www.municode.com/.
[158] Phone interview with Steve Letson, director of commercial appraisal services, Palm Beach County, on March 23, 2010.
[159] Email from Sally Bruner, Revenue Tax Manager, Volusia County (on file with the author).
[160] Email from Susan D. Profant, Delinquent Collections Department, Tax Collector, Manatee County, Florida (on file with the author).
[161] FLA. STAT. § 193.011.
[162] FLA. CONST. art. VII, §§ 4(a), (b), and (e), respectively.

current use.[163] Subsequently, in November, amendment 6 — Assessment of Working Waterfront Property Based Upon Current Use — was passed with over 70% of voter support.[164]

The terms of the amendment apply to the tax year beginning January 1, 2010.[165] Although the amendment uses the term "working waterfront properties," the enumerated properties to which the amendment applies are a subset of those properties defined as recreational and commercial working waterfronts in Fla. Stat. § 342.07(2). The properties for which current use appraisal shall apply include waterfront properties that are predominantly used for commercial fishing; are accessible to the public for launching boats; consist of marinas or drystack storage facilities that are open to the public; or are water-dependent marine manufacturing or boat construction and maintenance facilities.[166] Upland restaurants and hotels are not included in the list.

Local tax assessors are awaiting legislative and DOR guidance for calculating "current use" assessments. The 2009 legislative session produced bills that died at the end of session.[167] Four bills were introduced to the House and Senate during the 2010 legislative session.[168] When a final bill is passed, it will apply retroactively to January 1, 2010. The Revenue Estimating Committee has calculated that the provisions of Senate Bill (S.B.) 1408 will "reduce local government revenues (including schools) by $44.2 million in FY 2010-11 and by $44.7 million in FY 2011-12."[169] The estimated loss of revenue under House Bill (H.B.) 7127 would be slightly less at $37.4 million in FY 2010-11 and $37.8 million in FY 2011-12.[170] The estimates assume maintaining current millage rates.[171]

All four of the proposed bills would have created a new statutory section in Chapter 193 of Title XIV, Taxation and Finance.[172] SB 1408 included a statement on legislative intent. The intent statement recognized the impact that conversion to private access has on both restricting public access and on increasing the tax burden on nearby waterfront properties still engaged in public access uses.[173] The bill defined terms relevant to the provision, provided that the income approach to value method should be used to assess the property or, if that method is inappropriate, the

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[163] *See* Florida Taxation and Budget Reform Commission, Working Waterfront Assessment Constitutional Proposal, CP0006 (2007), *available at* http://www.law.fsu.edu/library/databases/ftbrc/pdf/CP0006.pdf; CP0006 Transmittal Letter dated Apr. 28, 2008, *available at* http://www.law.fsu.edu/library/databases/ftbrc/pdf/4_29_08CPTransmittalLetter.pdf .

[164] Fla. Dept. of State, Division of Elections, http://election.dos.state.fl.us/initiatives/initdetail.asp?account=12&seqnum=7 (last visited May 3, 2011).

[165] FLA. CONST. art. XII, § 30.

[166] FLA. CONST. art. VII, § 4(j)(1).

[167] H.B. 825, 2009 Leg., Reg. Sess. (Fla. 2009) and S.B. 1468, 2009 Leg., Reg. Sess. (Fla. 2009).

[168] S.B. 346, 2010 Leg., Reg. Sess. (Fla. 2010) introduced by Committee on Community Affairs; S.B. 1408, 2010 Leg., Reg. Sess. (Fla. 2010) introduced by Finance and Tax; H.B. 73, 2010 Leg., Reg. Sess. (Fla. 2010) introduced by Reps. Robaina and Mayfield; H.B. 7127, 2010 Leg., Reg. Sess. (Fl. 2010) introduced by the Finance & Tax Council. All four of these bills died at the end of the 2010 regular session and the issue remains unresolved.

[169] Staff Analysis Report on H.B. 7127, 2010 Leg., Reg. Sess. (Fla. 2010).

[170] *Id.*

[171] *Id.*

[172] The bills propose the creation of FLA. STAT. § 193.704.

[173] S.B. 1408, sec. 1.

present cash value at current use should be used to value the property.[174] To receive the benefit of current use valuation assessment, qualifying property owners would have to submit an application to be classified as a working waterfront property and a new application would be required whenever the ownership or use of the property changed.[175] Finally, where a parcel contains uses that are eligible for classification as working waterfront as well as uses that are not eligible for the classification, the portions of the property that are not eligible for the classification must be separately assessed under just valuation methods.[176]

VII. Challenges of Addressing Access Loss under Florida Law

The disposition of waterfront property with public access has at least four interested parties: the owner/potential seller, the potential buyer, the local taxing authority, and the general public, whose interest is in the access to the waters over the adjacent sovereign submerged lands. Of these four parties, the general public as represented by the Board of Trustees is, arguably, the most powerful, and yet, the most removed. Private property rights place the owner/seller and potential buyer in a preferential position in determining the disposition of the property. Preventing access loss on privately owned property requires either restrictive regulation or reducing the economic appeal of a conversion that will disrupt public access.

The loss of public access is often presented in monolithic terms. However, the discrete components of the public access problem may need to be addressed through different policy options. The loss of access to boat ramps is categorically different from the loss of publicly available wet slip storage that occurs when a marina is converted to a "dockominium."[177] Likewise, other water-dependent commercial enterprises such as boat building and repair represent something more of a service and support to members of the public than a general public access point. Finally, commercial fishing, while an important traditional waterfront use that should arguably be preserved, does not normally provide actual access to and from the water to the general public.

A. Boat Ramps

Addressing the need for boat ramp access is likely within the capacity and interests of the local taxing authority. Boat ramps are comparatively passive infrastructure; they are often publicly owned and have a comparatively lower overhead cost to operate than a publicly owned marina. LOSS addressing the need for boat ramps are often set by local governments in the capital improvement element of their comp plan as non-mandatory "guidelines."[178] Of course, the planning authority should have a high level of control over the disposition of any privately owned boat ramp facility that is used to calculate a LOSS. Otherwise, loss of a ramp due to increasing property values will cause a decreased LOSS at the very time that replacement properties are priced

[174] *Id.* at sec. 2 and 3(b).
[175] *Id.* at sec. 3(c).
[176] *Id.* at sec. 3(c)7.
[177] A dockominium consists of a multi-slip dock where each of the slips are privately owned. The Dockominium Group, FAQs Part One, http://www.thedockominiumgroup.com/faqs.1.html.
[178] For example, § 103-3(c)(6)(b) of the Panama City, Florida Code of Ordinances sets a guideline of 1 boat ramp per 5,000 people, available at Municode.com.

beyond the local government's financial reach. The control could be in the form of a less than fee simple interest such as an easement or a contractual agreement. For publicly owned boat ramps and marinas, local governments should at least employ a strict no net-loss policy.

B. Marinas

As mentioned above, coastal counties and municipalities are required to incorporate "strategies" to preserve recreational and commercial working waterfronts in the coastal element of their comp plans[179] and coastal counties are required to create "regulatory incentives and criteria" to encourage preservation.[180] These statutory and regulatory requirements are the state's attempts to force the local taxing/governing authority to develop the means to offset the market incentives that are driving the conversion from public to private access.

Trying to establish a level of service for marinas is problematic because it is improper to apply LOSS and concurrency requirements where the majority of the facilities are privately owned. As previously discussed, concurrency requirements associated with LOSS operate to prevent *new* development from occurring where *public* infrastructure cannot support it. The requirement is not structured to deny a change in use of private property in order to maintain a certain availability of services for a given population. The duty to provide infrastructure that meets the LOSS is on the local government, not the private individual. Thus, use of LOSS and concurrency requirements to prevent loss of public access through conversion of private property is unavailable.

Land use regulation tools are available that, if cohesively and creatively used in support of specific comp plan policies, can militate against conversion while avoiding the unconstitutional taking of property. Prohibiting the residential development of working waterfronts through zoning is a direct approach. Unless the property owner has expended money or made improvements in reliance on current zoning, there is no property right to the continuation of existing zoning[181] and a zoning change will not support a takings claim. It is not clear whether a successful Bert Harris claim could be brought against a specific down-zoning since the statutory definition of "existing use" includes "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."[182] Regardless, the prevention of conversion to residential development through zoning does not ensure public access will be maintained. Privatization of marina access can still occur, and attempts to directly mandate public access through zoning could raise *per se* takings issues if it destroys the property right to exclude others.[183]

Although zoning is a potentially powerful tool, there is a perverse incentive for the local taxing authority to be ineffective at the task of preserving existing working waterfronts. Waterfront property has some of the very highest property value and a conflict of interest arises when the taxing authority is expected to prevent a conversion that is financially beneficial to the seller, the buyer, and, as evidenced by the projected revenue loss under the current use assessment process, to

[179] FLA. STAT. § 163.3178(2)(g).
[180] *Id.* § 163.3178(6)(a).
[181] *See* Smith v. City of Clearwater, 383 So.2d 681 (Fla. 2nd DCA 1980).
[182] FLA. STAT. § 70.001(3)(b).
[183] Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 415 (1982).

the taxing authority itself. Thus, there is constant pressure on local government to allow the conversion. Other pressures leading to conversion are the costs associated with developing new dock spaces. Initial development of a marina has high regulatory and startup costs.[184] Siting, permitting, and dock construction must all be complete prior to operation. Consequently, developers will be attracted to an established site where many, if not all, of the regulatory hurdles have already been overcome.[185]

To prevent the conversion of marinas, it needs to be cheaper to develop a new site than to convert the existing one. This involves either reducing the cost to develop elsewhere or increasing the cost of conversion. The value of the property is determined by the market, but the value of the sovereign submerged land lease is determined by rules established by the DEP under the authority of the Board of Trustees. Although waterfront owners do have basic riparian rights,[186] they do not have any vested interest or right in the use of SSL. Thus, the costs and conditions placed upon SSL leases could effectively preserve public access while avoiding takings issues.

A 2008 senate report by the Committee on Environmental Preservation and Conservation[187] found that "roughly half (1347 leases or 51.01 percent) of all current SSL leases are issued to private entities with no public access." The structure of the lease program should allow private use, multi-family docks to be developed in previously undeveloped and appropriate locations. However, the conversion to private use of a SSL lease currently allowing public access should come at a higher premium – a premium that will help offset the costs of development that the conversion process has previously avoided. The premium should reflect the value of the location and not just the size of the lease. These steps would remove some of the incentive of purchasing these marinas.

In the current economic climate there is a reduction in the *incentive* to sell but property taxes may continue to exert *pressure* to sell. The working waterfront property tax amendment reduces pressure to sell due to high tax burden but will not remove the incentive to sell due to high property value once the market recovers. Instead of reducing the development potential to match the current use of the property, the amendment allows the existing zoning to remain in place while allowing owners to receive a "classification" of "working waterfront" for assessment purposes.

Now is an opportune time to link the lower tax burden classification to restrictions on future conversion. This can be accomplished by linking the "working waterfront" designation needed for the "current use" tax break to the condition that the property is restricted from other development "as of right." As landowners apply for and are designated as meeting the use conditions applicable for the classification, future land use restrictions should be employed under the various tools of local land development regulation that, essentially, only recognize and allow for working waterfront uses as of right. Thus, in exchange for the tax reduction, the use of the property would be specifically and legitimately constrained by local regulation. The property owner could still petition for a zoning change in the future but would not be able to develop vested rights in conflict with working waterfront preservation under the current zoning. However, such tight restriction

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[184] *See* Interim Summary Report of the Committee on Community Affairs, S. 2005-122, Reg. Sess. (Fla. 2004).

[185] *Id.*

[186] Riparian rights include "rights of ingress, egress, boating, bathing, and fishing and such others as may be or have been defined by law." FLA. STAT. § 253.141(1).

[187] Interim Report of the Committee on Environmental Preservation and Conservation, S. 2009-112, Reg. Sess. (Fla. 2008).

may be a step too far. The tax deferment program serves as a stark reminder of the law of unintended consequences. Rigid future use control may upset current financial strategies and thereby pressure the owner to convert regardless of the availability of a lower tax classification.

Finally, to address projected increases in public access needs, local governments should be required to develop marina siting plans. Previously, boat facility siting plans have been required for the purpose of manatee protection and were developed with the focus on such protection. Currently, development of these plans is merely "encouraged" under the coastal management section of the Growth Management Act.[188] An update to siting plans should focus on the long-term retention and development of public access for boating purposes. A recently released, comprehensive inventory and analysis of recreational boating needs has been issued by the Florida Fish and Wildlife Conservation Commission.[189] The results of this study, along with other appropriate modeling tools, should be used to identify optimal siting of future maritime infrastructure components that provide public access to Florida's waters.

C. *Water-Dependent Facilities and Commercial Fishing*

Apart from the SSL issue, much of the discussion regarding marinas is applicable to these categories of water-dependent uses. Because these other uses are more business-oriented and do not have a true "public access" aspect to their use, charging a large conversion premium for the SSL lease would create a policy favoring one type of water-dependent business interest over another, where the interests of the public trust are not as easily recognized and defined. Land development regulation that restricts residential development from these sites remains the best policy option.

VIII. Conclusion

Although known as the Sunshine State, Florida is just as readily defined by its waters. The attraction of the waterfront has led to ever-higher population densities. The ease of access by the public to the waterfront or shoreline and onto the water itself has become constricted and contested. Recognizing the importance of recreational access to the quality of life of the residents and recognizing the historical and continuing importance of commercial working waterfronts to the state, the Florida Legislature has manifested its intent to preserve and provide these types of waterfront uses.

Effective strategies to preserve and create access will vary. However, certain broad directions exist for the various waterfront use types. For access through the use of boat ramps, firm LOSS coupled with land development regulations may prove sufficient. To preserve marinas, and similar facilities that provide high levels of public access, application of the SSL lease program to charge a compensating premium for the process of conversion to private access should be implemented. Consideration should also be given to a strategy whereby all properties that receive designation as

[188] FLA. STAT. § 163.3178(6) (2010).

[189] FLORIDA FISH AND WILDLIFE COMMISSION, FLORIDA BOATING ACCESS FACILITIES INVENTORY AND ECONOMIC STUDY (2009) *available at* myfwc.com/media/1162720/About_Econ_BAFI_Full_09.pdf (last visited May 3, 2011).

"working waterfront" for the purpose of tax assessment on a "current use" basis are identified and classified under local land use regulations in a manner that prevents the vesting of any development right not in keeping with working waterfront uses. Finally, all local governments should develop marina siting plans that identify and designate optimal future sites for facilities that allow public access. In this way, *all* future Floridians may yet hope to have the means to make their way onto the water.

Sea Level Rise Planning for Florida's Nuclear Energy Infrastructure: A Wait and "Sea" Approach?

James F. Choate III[1]

Even Castles made of sand, fall into the sea, eventually.
-Jimi Hendrix

Abstract: This Article seeks to highlight the apparent head-on collision of the latest sea level rise projections with the current and future siting of Florida-based nuclear power plants. In general, the author assesses current planning measures and explores the degree to which decision-makers are integrating sea level rise science into reactor permitting decisions. Following a brief overview of the current state of climate change science, background is provided on the siting and operation of Florida's existing and future nuclear power plants. The agency permitting regimes for new nuclear reactors at the local, state, and federal level are then examined to determine the extent to which sea level rise implications have been accounted for in siting Florida's newly proposed reactors. The article concludes with a review of existing planning measures and adaptation strategies that respond to climate-change and sea level rise science, and assesses whether such measures might have potential application and value in safeguarding Florida's nuclear energy infrastructure.

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I. Introduction

In light of the shocking events surrounding the coastal flood vulnerabilities exposed at Japan's Fukushima Daiichi nuclear complex in the wake of the March 11, 2011 earthquake and tsunami,[2] flood safety concerns at nuclear power plants around the world have become a reality.[3] And although Japan's catastrophic nuclear disaster resulted from seismic activity rather than climate change *per se*, the resulting horror of what happened in Japan forces the issue of how climate-induced sea level rise and its potential for enhanced weather events (e.g., floods, hurricanes, etc.) may affect similarly situated nuclear reactors around the world.[4]

Twenty-two years after James Hansen testified to Congress about global warming (now commonly referred to as "climate change"), a very political debate rages on as scientists, politicians, and the like continue to argue over the accuracy of climate change studies such as the UN's Intergovernmental Panel on Climate Change AR4 report (IPCC AR4).[5] But if climate-induced sea level rise projections and associated flood-safety concerns (e.g., enhanced storm events, hurricanes,

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[2] Int'l Atomic Energy Agency (IAEA), *Fukushima Nuclear Accident Update Log: Updates of 12-18 May 2011*, *available at* http://www.iaea.org/newscenter/news/tsunamiupdate01.html.

[3] *Nuclear Regulatory Commission Chief Says Agency will Examine Flood Risk at US Nuclear Plants*, ASSOCIATED PRESS (Washington), May 2, 2011, *available at* http://www.syracuse.com/have-you-heard/index.ssf/2011/05/nuclear_regulatory_commission.html. *See also, Last Decade of German Nuclear Power*, WORLD NUCLEAR NEWS, May 31, 2011, http://www.world-nuclear-news.org/NP_Last_decade_of_German_nuclear_power_3105111.html (reporting Germany's announcement to "avoid restarting the seven reactors shut[down] during the moratorium and close the rest by 2022.").

[4] *See* Alyson Kenward, *Sea Level Rise Brings Added Risks to Coastal Nuclear Plants*, CLIMATE CENTRAL, Mar. 23, 2011, http://www.climatecentral.org/news/sea-level-rise-brings-added-risks-to-coastal-nuclear-plants. *See also* U.S. EPA, *Coastal Zones and Sea Level Rise*, http://epa.gov/climatechange/effects/coastal/index.html (discussing enhanced storm and flooding events). *But see* U.S. Nuclear Regulatory Comm'n (NRC), *Frequently Asked Questions About the Japan Nuclear Crisis: "Can It Happen Here?,"* http://www.nrc.gov/japan/faq-can-it-happen-here.pdf ("Along the Gulf Coast and the Atlantic Coast, storm surge from hurricanes poses a greater threat than tsunamis to nuclear power plants. The plants in these regions are well protected against hurricane storm surge."); Progress Energy, *Progress Energy's Response to Japan's Fukushima Nuclear Events*, March 17, 2011, https://www.progress-energy.com/assets/www/docs/company/events-in-japan.pdf, ("Our plants' emergency electrical supplies are designed and built to withstand the impacts of all historical natural disasters for our area, such as hurricanes, tornados, earthquakes and flooding (including storm surges) at our coastal plants.").

[5] The IPCC, with a primary purpose of reporting the most up-to-date state of knowledge on climate change at regular intervals, recently issued IPCC Fourth Assessment Report: Climate Change 2007 (AR4), and is currently working on its fifth assessment report (AR5). *See* Intergovernmental Panel on Climate Change (IPCC), *Reports*, http://www.ipcc.ch/publications_and_data/publications_and_data_reports.htm. *See, e.g.*, IPCC, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS (Susan Solomon et al. eds., Cambridge Univ. Press, Cambridge, UK, and New York 2007) [hereinafter IPCC, AR4].

floods, etc.) are to be believed to any extent,[6] coastal states such as Florida must face whether newly proposed U.S. coastal nuclear reactors should be built in such vulnerable locations. Interestingly, as short- and long-term planning and development of the Florida coastlines continues, coastal infrastructure – including the potential for additional coastal nuclear reactors – is expanding rather than waning, even in light of the increasingly dire predictions of climate-induced sea level rise.[7]

Fortunately, policy-makers at all levels of government are beginning to realize the high stakes gambling game at play, and, in some cases, taking action to assess the coming impacts of sea level rise.[8] And although Japan's ongoing nuclear disaster has yet to halt proposals for newly constructed U.S. coastal nuclear reactors,[9] it is also important to recognize that those tasked with anticipating and planning to protect Florida's geographically vulnerable coastal infrastructure face particularly difficult decisions. Ultimately, effective countermeasures to sea level rise and enhanced storm events will not come easy, as formidable questions of policy await the delicate balancing act of allowing coastal growth to continue without shunning climate change and sea level rise altogether.[10] At the heart of this balance is the overly simple but extremely difficult questions of *where* to allow ongoing development, and *to what degree* existing and future development should be armored, protected, moved, etc.

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[6] *See, e.g.*, Thomas R. Knutson, Geophysical Fluid Dynamics Laboratory/NOAA, Global Warming and Hurricanes (finding that "[a]nthropogenic warming over the next century will likely cause hurricanes globally to be more intense (by a few percent on average) and have substantially higher rainfall rates than present-day hurricanes."), *available at* http://www.gfdl.noaa.gov/global-warming-and-hurricanes.

[7] *See* Mark Schrope, *Unarrested Development*, 4 NATURE REPORTS CLIMATE CHANGE 36 (Apr. 2010) (reporting that "[d]espite the threat of rising sea levels, the drive to develop Florida's coastline continues"), *available at* http://www.nature.com/climate/2010/1004/pdf/climate.2010.27.pdf. *See also* FED. EMERGENCY MGMT. AGENCY, PROJECTED IMPACT OF RELATIVE SEA LEVEL RISE ON THE NATIONAL FLOOD INSURANCE PROGRAM ii (October 1991) ("Assuming current trends of development practice continue, the increase in the expected annual flood damage by the year 2100 for a representative NFIP insured property subject to sea level rise is estimated to increase by 36-58 percent for a 1-foot rise, and by 102-200 percent for a 3-foot rise in sea level."), *available at* http://epa.gov/climatechange/effects/downloads/flood_insurance.pdf.

[8] *See* CTR. FOR CLIMATE STRATEGIES, FLORIDA'S ENERGY AND CLIMATE CHANGE ACTION PLAN Ch.8 (2009), *available at* http://www.flclimatechange.us/; MIAMI-DADE COUNTY CLIMATE CHANGE TASK FORCE – SCI. & TECH. COMM., STATEMENT ON SEA LEVEL IN THE COMING CENTURY (Jan. 17, 2008) [hereinafter MIAMI-DADE CCATF, SLR STATEMENT]; SOUTH FLORIDA WATER MGMT. DIST., PRELIMINARY ESTIMATE OF IMPACTS OF SEA LEVEL RISE ON THE REGIONAL WATER RESOURCES OF SOUTHEASTERN FLORIDA, ADAMS Accession No. ML102740603; SOUTH FLORIDA WATER MGMT. DIST., ESTIMATED IMPACTS OF SEA LEVEL RISE ON FLORIDA'S LOWER EAST COAST, ADAMS Accession No. ML102740602; U.S. Army Corps of Eng'rs, *Water Resource Policies and Authorities Incorporating Sea-level Change Considerations in Civil Works Programs*, Circular No. 1165-2-211, July 1, 2009, *available at* http://www.corpsclimate.us/guidance.cfm.

[9] Andrew Freedman, *Japan's Nuclear Crisis Sparks Conversation on Energy Safety*, CLIMATE CENTRAL, Mar. 15, 2011, http://www.climatecentral.org/blogs/nuclear-power-crisis-sparks-conversation-on-energy-safety/.

[10] *See* Schrope, *supra* note 7.

Within this context, the stakes have perhaps never been higher for utility companies and their regulatory counterparts who must decide whether to move forward with financing[11] and building what would be Florida's first nuclear reactors in over 30 years.[12] Upon considering that Florida already has five coastal nuclear reactors, with four more multi-billion dollar reactors in the works,[13] real questions as to the future viability of Florida's current and proposed coastal reactor sites come into focus. Because nuclear reactors are permitted for forty-year periods, with an option for renewal,[14] several of Florida's existing coastal reactors will likely face sea level rise impacts during the next half-century regardless of whether plans for new reactors move forward.[15]

This Article seeks to highlight the apparent head-on collision of the latest sea level rise projections with the current and future siting of Florida-based nuclear power plants. In general, it will assess current planning measures, and explore the degree to which decision-makers are integrating sea level rise science into reactor permitting decisions. Part II provides a brief overview of the current state of climate change science. Part III explores Florida's current nuclear profile, and provides background on the siting and operation of Florida's existing and future nuclear power plants. Part IV examines the agency permitting regimes for new nuclear reactors at the local, state, and federal level, and assesses the extent to which sea level rise implications have been accounted for in siting Florida's newly proposed reactors.

Part V reviews existing planning measures and adaptation strategies that respond to climate-change and sea level rise science, and assesses whether such measures might have potential application and value in safeguarding Florida's nuclear energy infrastructure. Specifically, Part V examines how projected negative impacts to Florida's nuclear energy infrastructure might be offset

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[11] It is important to note that even upon setting aside environmental concerns, the economics of new U.S. reactors are less than certain. *See* JOHN M. DEUTCH ET AL., UPDATE OF THE MIT 2003 FUTURE OF NUCLEAR POWER 6 (MIT 2009) ("While the U.S. nuclear industry has continued to demonstrate improved operating performance, there remains significant uncertainty about the capital costs, and the cost of its financing, which are the main components of the cost of electricity from new nuclear plants."); GEORGE S. TOLLEY & DONALD W. JONES, THE ECONOMIC FUTURE OF NUCLEAR POWER: A STUDY CONDUCTED AT THE UNIVERSITY OF CHICAGO xi (2004) (finding that new U.S. nuclear electricity may cost more per megawatt-hour than coal- and gas-fired electricity even with federal financial policy assistance supporting new reactors), *available at* http://www.ne.doe.gov/np2010/reports/NuclIndustryStudy-Summary.pdf. *But see* WORLD NUCLEAR ASS'N, THE ECONOMICS OF NUCLEAR POWER (2010) (finding that "[n]uclear power is cost competitive with other forms of electricity generation, except where there is direct access to low-cost fossil fuels."), *available at* http://world-nuclear.org/info/inf02.html; WORLD NUCLEAR ASS'N, THE NEW ECONOMICS OF NUCLEAR POWER (2005) (summarizing recent nuclear economic studies and citing Finland's fifth reactor as an example of how new nuclear plants can be economically competitive against alternative energies), *available at* http://www.world-nuclear.org/reference/pdf/economics.pdf.

[12] Press Release, Fla. Dep't of Envtl. Prot. (DEP), Florida Cabinet Approves Site Certification for Progress Energy Florida's Levy Nuclear Plant (Aug. 11, 2009), *available at* http://www.dep.state.fl.us/secretary/news/2009/08/0811_02.htm [hereinafter DEP Press Release].

[13] U.S. ENERGY INFORMATION ADMIN., STATUS OF POTENTIAL NEW COMMERCIAL NUCLEAR REACTORS IN THE UNITED STATES (Release date July 1, 2010), *available at* http://www.eia.doe.gov/cneaf/nuclear/page/nuc_reactors/com_reactors.pdf.

[14] U.S. NRC, *Combined License Applications for New Reactors*, http://www.nrc.gov/reactors/new-reactors/col.html.

[15] U.S. Energy Information Admin., *Florida Nuclear Profile*, http://www.eia.doe.gov/cneaf/nuclear/state_profiles/florida/fl.html.

through actions taken sooner rather than later, and asserts that the time to make significant gains in minimizing the negative effects of climate-induced sea level rise is now – before new multi-billion dollar coastal reactors are built. Further, Part V recommends that energy companies either (1) begin to take voluntary measures to minimize accelerated sea level rise impacts including decisions for siting future plants, or (2) openly disregard accelerated sea level rise projections by taking a public stance that accelerated projections are simply wrong. Ultimately, Part V advocates that the existing industry and regulatory refusal to account for accelerated sea level rise projections, when combined with the continued practice of siting nuclear reactors on the Florida coastline, creates an unwarranted risk of disaster.

II. Sea Level Rise Science

As affirmed by the 2007 IPCC AR4 report, climate-induced sea level rise occurs for three primary reasons: (1) an expansion of ocean waters as a result of warmer ocean temperatures, (2) the melting of mountain glaciers and ice caps, and (3) to a lesser extent, the melting of the Greenland and Antarctic ice sheets.[16] But even before the existence of supposed man-made climate change, it is important to note that the landward extent of Florida has seen dramatic shifts through time.[17] For example, during the last interglacial period 120,000 years ago, South Florida was a shallow marine environment.[18] And during a glacial period 18,000 years ago, sea level was at *minus* 420 feet, which nearly doubled the landward extent of Florida and extended its western boundary 100 miles into the Gulf of Mexico.[19] Thus, although the fate of Florida remains largely unknown in the face of sea level rise in the coming century, it is clear that Florida's coastline is subject to extreme changes over time (e.g., centuries and millennia) regardless of human impacts. Compounding this reality with an assumption that human-impacts are now somehow influencing this natural process (as climate change science suggests), it is alarming that U.S. coastlines, including Florida, are predicted to see dramatic and unprecedented change in sea level in *decades*, rather than centuries and millennia.[20] Unfortunately, some climate scientists are now suggesting that the speed at which

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[16] IPCC, AR4, *supra* note 5. *See also* U.S. EPA, *Sea Level Changes*, http://epa.gov/climatechange/science/recentslc.html. Other proposed contributing factors include the human consumption of groundwater, impoundment in reservoirs, wetland drainage, and deforestation. *Id.*

[17] Presentation, SCIENCE COMM. OF THE MIAMI-DADE COUNTY CLIMATE CHANGE ADVISORY TASK FORCE, STATEMENT ON SEA LEVEL IN THE COMING CENTURY (April 22, 2008) [hereinafter MIAMI-DADE CCATF, SLR PRESENTATION], *available at* http://www.miamidade.gov/derm/library/08_04_22Statement_on_Sea_Level.pdf.

[18] *Id.*

[19] *Id.*

[20] *See, e.g.*, SCIENCE COMM. OF THE MIAMI-DADE COUNTY CLIMATE CHANGE ADVISORY TASK FORCE, STATEMENT ON CRITICALLY IMPORTANT RECENT FINDINGS ON CLIMATE CHANGE AND ANTICIPATED SEA LEVEL RISE (April 2010), *available at* http://www.miamidade.gov/derm/climatechange/library/meeting_documents_2010/sea_level_rise.pdf. *See also* U.S. EPA, *Coastal Zones and Sea Level Rise*, http://epa.gov/climatechange/effects/coastal/index.html.

climate-induced sea level rise occurs could be increasing at unprecedented rates, the accuracy and extent of which is simply unknown.[21]

Although climate change and its projected impacts (e.g., sea level rise) have gained international prominence in recent years, sea level rise has been a looming environmental issue for Florida for at least a decade.[22] Fourteen years ago (in 1997), the U.S. Environmental Protection Agency (EPA) estimated that as a result of climate change, Florida will likely experience a sea level rise of 18 to 20 inches (1.75 to 1.83 feet) by 2100,[23] and, further, that the cumulative cost of replenishing Florida's coast with enough sand to withstand a 20-inch (1.83 foot) rise in sea level by 2100 would be $1.7 to $8.8 billion.[24]

In 2007, IPCC AR4 projected a global sea level rise of 18 to 59 centimeters (0.59 to 1.93 feet) from 1990 to the 2090's.[25] And now fast forward four years to 2011. Although the scientific community seems to agree that the extent to which sea level rise will occur over the course of this century is simply unknown, the latest science also seems to suggest that, if anything, past sea level predictions have underestimated the potential for accelerated increases.[26] And in acknowledging the limits of linear sea level rise modeling (i.e., relying upon historically linear data *only*), the latest science relates that accurate sea level rise predictions prove extremely difficult due to potential exponential increases resulting from melting icecaps, the accelerated rate of which is simply unaccounted for in many current models.[27] As a result, anticipated sea level rise projections that would have been dismissed as wildly extreme outliers in past years, are, in the eyes of some scientists, not necessarily so wild or improbable anymore.[28] For example, as acknowledged in a 2009 U.S. Global Change Research Program (USGCRP) report, "recent estimates of global sea-level rise substantially exceed the IPCC estimates, suggesting sea-level rise between 3 and 4 feet in this century."[29] At this rate, much of South Florida, if not a significant portion of the entire state would be under water in less than 100 years from now.[30] Although anything more than three to five feet (+1 meter) by year 2100 would still appear extreme, even a one-foot rise in sea level would inundate many coastal areas of Florida.[31]

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[21] Stefan Rahmstorf, *A New View on Sea Level Rise: Has the IPCC Underestimated the Risk of Sea Level Rise?*, 4 NATURE REPORTS CLIMATE CHANGE 44 (April 2010), *available at* http://www.nature.com/climate/2010/1004/pdf/climate.2010.29.pdf. *See also* U.S. EPA, *Sea Level Changes*, http://epa.gov/climatechange/science/recentslc.html; U.S. EPA, *Future Sea Level Changes*, http://www.epa.gov/climatechange/science/futureslc.html.

[22] U.S. EPA OFFICE OF POLICY, PLANNING AND EVALUATION (2011), CLIMATE CHANGE AND FLORIDA, EPA 230-F-97-008i (Sept. 1997).

[23] *Id.*

[24] *Id.*

[25] IPCC, AR4, *supra* note 5.

[26] *See* Rahmstorf, *supra* note 21, at 44-5.

[27] *See id.*

[28] *See id.*

[29] U.S. GLOBAL CHANGE RESEARCH PROGRAM, GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES 150 (Thomas R. Karl, Jerry M. Melillo & Thomas C. Peterson eds., Cambridge Univ. Press 2009) [hereinafter USGCRP REPORT], *available at* http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf.

[30] MIAMI-DADE CCATF, SLR PRESENTATION, *supra* note 17.

[31] *Id.*

Regardless, the purpose of this Article is not to engage in an overly technical examination of sea level rise science, or to make any assessment as to whose science is most credible. To the contrary, this Article merely aims to acknowledge what appear to be two emerging trends within the scientific community: (1) that sea level rise predictions have potentially been underestimated in recent years, and (2) that although *accelerated* sea level rise may occur in the next half century and beyond, accurate predictions are simply beyond current scientific modeling.[32] In this regard, current science seems to raise more questions than answers, which leads to an uncomfortable state of uncertainty for policy-makers attempting to make sense of predictions as to what coastal communities and their supporting infrastructure will ultimately face in coming decades. Sound policy, other than a strict application of the precautionary principle, simply cannot flow from such uncertainties, and yet the permitting process for new coastal reactors moves forward.[33]

Perhaps reinforcing the chaotic nature (or at least the pervasiveness) of current climate change science and the ensuing duty to respond, there is no shortage of both independent and collaborative climate change studies among the various federal agencies. In fact, the EPA has been studying sea level rise for the last twenty-five years.[34] And since 1989, the USGCRP,[35] comprised of thirteen federal agencies, has been actively "build[ing] a knowledge base that informs human responses to climate and global change through coordinated and integrated federal programs of research, education, communication, and decision support."[36] As part of the USGCRP, the U.S. Geological Survey (USGS),[37] U.S. Army Corps of Engineers (Corps),[38] National Oceanic and Atmospheric Administration (NOAA),[39] U.S. Department of Energy (DOE),[40] and EPA,[41] are among the thirteen federal agencies actively addressing climate change science and its associated

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[32] It is important to acknowledge the limits of using historical sea level data from the past 100 years to project sea level rise over the next 100 years if *accelerated* sea level rise is occurring. Rahmstorf, *supra* note 21, at 44-5.

[33] INT'L ATOMIC ENERGY AGENCY, FLOOD HAZARD FOR NUCLEAR POWER PLANTS ON COASTAL AND RIVER SITES, No. NS-G-3.5, § 14.9, 72 (2003) (recommending that "[w]ithin the framework of the Intergovernmental Panel on Climate Change investigations in relation to climate change, ... the upper boundary of the 95% confidence interval should be taken" when considering nuclear power plant safety), *available at* http://www-pub.iaea.org/MTCD/publications/PDF/Pub1170_web.pdf.

[34] A portion of EPA's website, entitled "Sea Level Rise Reports," states that "[f]or the last 25 years, EPA has been assessing the implications of rising sea level and opportunities to prepare for the possible consequences." U.S. EPA, *Sea Level Rise Reports*, http://www.epa.gov/climatechange/effects/coastal/slrreports.html.

[35] The USGCRP began as "a presidential initiative in 1989 and was mandated by Congress in the Global Change Research Act of 1990 (P.L. 101-606)." USGCRP, *Program Overview*, http://www.globalchange.gov/about.

[36] *Id.*

[37] U.S. Geological Survey, *Sea Level and Climate*, http://pubs.usgs.gov/fs/fs2-00/.

[38] U.S. Army Corps of Eng'rs, *Responses to Climate Change*, http://www.corpsclimate.us.

[39] Nat'l Oceanic & Atmos. Admin., *NOAA Climate Service*, http://www.noaa.gov/climate.html.

[40] U.S. Dep't. of Energy, *Climate Change*, http://www.energy.gov/environment/climatechange.htm.

[41] U.S. EPA, *Climate Change*, http://epa.gov/climatechange/index.html.

impacts.[42] Curiously, the U.S. Nuclear Regulatory Commission (NRC), as the agency overseeing the permitting and regulation of U.S. nuclear reactors, is absent from the USGCRP program, and, in fact, the NRC has yet to provide any public comment on climate change science (to date).[43] But upon considering the danger that seemingly results from building a reactor in a vulnerable coastal location, it seems obvious that sea level rise science should be on the forefront of coastal siting decisions for new reactors.

In this vein, federal agencies are not the only governmental entities formulating climate change policy and taking a genuine interest in the vulnerabilities of coastal infrastructure. In Florida, the South Florida Water Management District (SFWMD) and the Miami-Dade County Climate Change Advisory Task Force (CCATF) are among the state and local entities taking sea level rise concerns very seriously. In 2008, and as recognized by the SFWMD,[44] the Miami-Dade CCATF made the following finding:

> Unfortunately, it looks as though sea level in the coming century will rise significantly more than two feet. With what is happening in the Arctic and Greenland, many respected scientists [footnote omitted] now see a likely sea level rise of **at least** 1.5 feet in the coming 50 years and a total of **at least** 3-5 feet by the end of the century, possibly significantly more (calculations used are provided at end of statement). Spring high tides would be at +6 to +8 feet. This does not take into account the possibility of a catastrophically rapid melt of land-bound ice from Greenland, and it makes no assumptions about Antarctica.[45]

When considering that "south Florida has experienced an average rate of relative sea level rise of about 1.5 inches per century" over the last 2,500 years, these predictions are of significant concern.[46]

III. Florida's Nuclear Energy Infrastructure

To oversimplify a highly sophisticated method of generating electricity, nuclear power plants operate by using the process of "fission" to cause uranium fuel to react and release heat, which is

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[42] For example, in 2008, the U.S Climate Change Science Program commissioned a USGS assessment of published scientific literature examining the projected impacts of climate change. *See* USGS-CCSP COMM., SYNTHESIS & ASSESSMENT PRODUCT 3.4: ABRUPT CLIMATE CHANGE SUMMARY AND FINDINGS (acknowledging that "an abrupt change in sea level is possible, but predictions are highly uncertain due to shortcomings in existing climate models"), *available at* http://downloads.climatescience.gov/sap/sap3-4/sap3-4-brochure.pdf.

[43] A May 2011 search of the NRC's website did not produce a single NRC webpage targeted at providing climate change or sea level rise information to the public. *See* http://www.nrc.gov.

[44] Letter from South Florida Water Mgmt. Dist. to Fla. Dep't of Envtl. Prot., Re: FPL Turkey Point Units 6 & 7, PA-3-45A3, Site Certification Application First Completeness Review (July 30, 2009) (acknowledging the Miami-Dade CCATF's prediction of a 1.5 to 5 foot sea level rise by 2050).

[45] MIAMI-DADE CCATF, SLR STATEMENT, *supra* note 8, at 3 (emphasis in original).

[46] *Id.* at 1.

used to convert water into steam to power a steam turbine and ultimately create electricity.[47] At this point, the non-radioactive steam is then converted back into water through the use of circulated cooling waters.[48] In light of this process, access to a consistent source of cooling waters proves crucial to the siting of new reactors, which makes Florida's coastlines very attractive to utility companies looking to take advantage of easily accessible ocean waters.[49] Even so, Florida's current nuclear capacity makes up only 7% of the state's total electric generating capacity, with nuclear generation representing approximately 15% of the state's total electric power generation.[50]

Traditionally, Florida has relied in large part on natural gas and coal fuels for the majority of electricity production needed to support one of the highest per capita demands in the country for residential electricity.[51] However, relatively low industrial electricity use offsets high residential and commercial demand (mostly resulting from high air-conditioning use during summer months) to result in relatively *low* total per capita electricity consumption.[52] Regardless, because "Florida [currently] has more petroleum-fired electricity generation than any other state,"[53] the resurgence in nuclear power has gained traction in Florida, as the state looks for ways to reduce its reliance on fossil fuel power (e.g., coal, natural gas, petroleum).[54] As explored below, Florida seems set on the idea of expanding its nuclear energy profile.[55]

A. *Existing Reactors*

Within the United States, seven nuclear reactors sites are located within two miles of either the Pacific or Atlantic Oceans.[56] Florida, as a peninsula state with over 1,260 miles of coastline,[57]

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[47] Florida Power & Light, *Nuclear Power Serves You*, http://www.fpl.com/environment/nuclear/nuclear_power_serves_you.shtml. *See also* U.S. NRC, *Power Reactors*, http://www.nrc.gov/reactors/power.html; PROGRESS ENERGY, CRYSTAL RIVER NUCLEAR PLANT: SAFETY INFORMATION 2010-2012, at 15 (explaining the mechanical operation of a nuclear power plant), *available at* https://www.progress-energy.com/assets/www/docs/home/crnp-safety.pdf.

[48] FPL, *supra* note 47.

[49] *See* NRC REGULATORY GUIDE 4.7 (REVISION 2), GENERAL SITE SUITABILITY CRITERIA FOR NUCLEAR POWER STATIONS, 4.7–6 – 4.7–7 (April 1998) (reviewing a nuclear reactor's cooling water requirements).

[50] U.S. EIA, *supra* note 15.

[51] U.S. EIA, *State Energy Profiles – Florida*, http://www.eia.doe.gov/state/state_energy_profiles.cfm?sid=FL.

[52] *Id.*

[53] *Id.*

[54] DEP, *supra* note 12 (reporting that Florida's approval of PEF's Levy Nuclear Plant "includes a requirement for [Crystal River's] coal-fired units to be discontinued by December 31, 2020, assuming timely licensing and construction" of the Levy Nuclear Plant).

[55] Press Release, Fla. Pub. Serv. Comm'n, *Florida Public Service Commission Adopts Rules to Encourage Nuclear Power Development* (Feb. 13, 2007), *available at* http://www.psc.state.fl.us/home/news/index.aspx?id=228.

[56] Letter from U.S. Nuclear Regulatory Comm'n to Rep. Edward J. Markey, Re: Impact of Rising Sea Levels on the Domestic U.S. Nuclear Power Industry 3 (May 28, 2008), ADAMS Accession No. ML081370004 [hereinafter U.S. NRC Letter]. *See also* Presentation, NATALIE KOPYTKO, SEA LEVEL RISE AT NUCLEAR POWER PLANTS IN THE UNITED STATES, WASHINGTON GIS CONFERENCE, at 8 (May 6, 2009), *available at* http://www.waurisa.org/conferences/2009/presentations/Weds/DickThomasStudentPaperCompetition_Weds_Kopytkoh_EvergreenState.pdf; Amanda Taub, *Third Annual Dick Thomas Student Paper Competition*, 16 THE SUMMIT: NEWS FROM AND FOR THE WASHINGTON GIS COMMUNITY 13 (Summer 2009), *available at* http://www.waurisa.org/thesummit/TheSummit_Summer_2009.pdf.

contains three of these seven coastal U.S. reactor sites, with a total of five coastal reactors operating within the State.[58] The combination of Florida's relatively flat geography and frequency of hurricane events leads to increased vulnerabilities (e.g., flooding, storm surges, wind damage, etc.) for the State's five coastal reactors.[59] Thus, as explored in a September 2010 *Energy Policy* article assessing flood-safety vulnerabilities of existing U.S. coastal nuclear power plants, the Progress Energy Florida (PEF) reactor at Crystal River, and the Florida Power & Light (FPL) reactors at St. Lucie and Turkey Point respectively, are among the most vulnerable U.S. reactors to the effects of sea level rise.[60]

1. Turkey Point (Units 3 & 4) – Florida Power & Light

FPL's Turkey Point facility is a 3,300-acre coastal site located at the southern tip of Florida as part of Miami-Dade County.[61] Of the four electric generation units at the Turkey Point site, only two are nuclear powered units (Units 3 & 4).[62] Unit 3, as the oldest active reactor in the state, dates back to December 14, 1972, and is currently licensed until 2032 (as a result of a twenty-year license extension granted in 2002 and taking effect in 2012).[63] Unit 4 commenced operation on September 7, 1973, and holds an operating license until mid-2033 (also as a result of a twenty-year license extension).[64] Biscayne Bay, a protected portion of the Atlantic Ocean, provides the cooling waters for Units 3 and 4.[65] As currently built, Units 3 and 4 sit on a pad, which elevates these structures to 18 feet above sea level.[66]

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[57] PHIL FLOOD, FLORIDA BEACHES AND SHORES 3, *available at* http://www.dep.state.fl.us/beaches/publications/pdf/actbook.pdf.

[58] U.S. EIA, *supra* note 15.

[59] *See* FLA. DEP'T OF ENVTL. PROT. (DEP), FLORIDA'S ENERGY PLAN 8 (Jan. 2006) ("The unprecedented level of storm activity during the 2004 and 2005 hurricane seasons spotlighted Florida's vulnerability to energy supply disruptions both in terms of power generation and transportation fuel supply."); U.S. NRC Information Notice 93-53, *Effect of Hurricane Andrew on Turkey Point Nuclear Generating Station and Lessons Learned*, July 20, 1993, *available at* http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/1993/in93053.html.

[60] Natalie Kopytko & John Perkins, *Climate Change, Nuclear Power, and the Adaptation-Mitigation Dilemma*, ENERGY POLICY (2010) (assessing the vulnerability of Florida's nuclear reactors sites a result of climate change); KOPYTKO, *supra* note 56, at 8. *See also* U.S. NRC Information Notice 93-53, *supra* note 59.

[61] U.S. EIA, *supra* note 15; FPL, *About Turkey Point*, http://www.fpl.com/environment/nuclear/about_turkey_point.shtml; FPL, *Turkey Point Nuclear Power Plant Fact Sheet*, http://www.fpl.com/environment/nuclear/pdf/turkeypointfact.pdf.

[62] U.S. EIA, *supra* note 15; FPL, *About Turkey Point*, *supra* note 61; FPL, *Turkey Point Nuclear Power Plant Fact Sheet*, *supra* note 61.

[63] U.S. EIA, *supra* note 15; U.S. NRC, *Turkey Point Nuclear Generating Unit 3*, http://www.nrc.gov/info-finder/reactor/tp3.html; U.S. NRC, *Turkey Point Nuclear Plant, Units 3 & 4 – License Renewal Application,* http://www.nrc.gov/reactors/operating/licensing/renewal/applications/turkey-point.html; FPL, *About Turkey Point*, *supra* note 61; FPL, *Turkey Point Nuclear Power Plant Fact Sheet*, *supra* note 61.

[64] U.S. EIA, *supra* note 15; U.S. NRC, *Turkey Point Nuclear Generating Unit 4*, http://www.nrc.gov/info-finder/reactor/tp4.html; U.S. NRC, *Turkey Point Nuclear Plant, Units 3 & 4 – License Renewal Application*, *supra* note 63.

[65] FPL, *About Turkey Point*, *supra* note 61; FPL, *Turkey Point Nuclear Power Plant Fact Sheet*, *supra* note 61.

[66] U.S. NRC Letter, *supra* note 56, at 3.

2. St. Lucie (Units 1 & 2) – Florida Power & Light

FPL also operates a St. Lucie plant (St. Lucie), a 1,130-acre facility that contains two reactors.[67] Located approximately eight miles southeast of Ft. Pierce on Florida's east coast, St. Lucie relies on the Atlantic Ocean as a continuous source of cooling waters.[68] Unit 1, as St. Lucie's first reactor, commenced operation on December 21, 1976, and is licensed until early-2036 (as a result of a license extension in 2003).[69] Unit 2 followed in 1983, and is Florida's most recently constructed reactor to date, with a license expiration date of 2043 (as a result of a 2003 license extension).[70] Similar to Turkey Point, St. Lucie Units 1 and 2 sit on an elevated pad, which is 19 feet above sea level.[71]

3. Crystal River (Unit 3) – Progress Energy Florida (PEF)

In 1977, Progress Energy Florida (PEF) commenced operation of Unit 3, a nuclear reactor sited at the 4,700-acre Crystal River Energy Complex in Citrus County, Florida on the west coast of Florida.[72] Unlike FPL's coastal reactors at Turkey Point and St. Lucie, PEF's Unit 3 relies upon intake waters from the Gulf of Mexico, rather than the Atlantic Ocean.[73] The grade level of Unit 3 is 30.5 feet above sea level.[74] Although Progress Energy has a pending license extension application for Unit 3, NRC is not expected to make a decision until July 2011 at the earliest.[75] Thus, at present, Unit 3's operating license is set to expire in 2016.[76] As of May 2011, Unit 3 has been shut down for a period of 20 months (i.e., May 2009) as a result of cracks and delamination in the concrete containment structure.[77]

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[67] U.S. EIA, *supra* note 15; FPL, *About St. Lucie*, http://www.fpl.com/environment/nuclear/about_st_lucie.shtml; FPL, *St. Lucie Nuclear Power Plant Fact Sheet*, http://www.fpl.com/environment/nuclear/pdf/stluciefact.pdf.

[68] U.S. EIA, *supra* note 15; FPL, *About St. Lucie*, *supra* note 67; FPL, *St. Lucie Nuclear Power Plant Fact Sheet*, *supra* note 67.

[69] U.S. EIA, *supra* note 15; U.S. NRC, *St. Lucie Plant, Unit 1*, http://www.nrc.gov/info-finder/reactor/stl1.html; U.S. NRC, *St. Lucie, Units 1 & 2 – License Renewal Application*, http://www.nrc.gov/reactors/operating/licensing/renewal/applications/st-lucie.html.

[70] U.S. NRC, *St. Lucie Plant, Unit 2*, http://www.nrc.gov/info-finder/reactor/stl2.html; U.S. NRC, *St. Lucie, Units 1 & 2 – License Renewal Application*, *supra* note 69; U.S. EIA, *supra* note 15.

[71] U.S. NRC Letter, *supra* note 56, at 3.

[72] U.S. EIA, *supra* note 15; U.S. NRC, *Crystal River Nuclear Generating Plant, Unit 3*, http://www.nrc.gov/info-finder/reactor/cr3.html; Progress Energy, *Crystal River*, http://www.progress-energy.com/aboutenergy/powerplants/nuclearplants/crystalriver.asp.

[73] U.S.EIA, *supra* note 15.

[74] U.S. NRC Letter, *supra* note 56, at 3.

[75] U.S. EIA, *supra* note 15; U.S. NRC, *Crystal River – License Renewal Application*, http://www.nrc.gov/reactors/operating/licensing/renewal/applications/crystal-river.html.

[76] U.S. EIA, *supra* note 15; NRC, *Crystal River – License Renewal Application*, *supra* note 75.

[77] *Update on Repairs to Progress Energy's Crystal River Nuclear Plant, Shut Down for 20 Months, Due in "Several Weeks*," ST. PETERSBURG TIMES, May 10, 2011, *available at* http://www.tampabay.com/news/business/energy/update-on-repairs-to-progress-energys-crystal-river-nuclear-plant-shut/1168828.

B. Future Reactors

As mentioned above, Florida is on the forefront of the recent resurgence in U.S. nuclear energy expansion.[78] Of the fourteen U.S. sites entertaining the construction of new commercial nuclear reactors (as of July 2010), two proposed sites are in Florida, with both Florida sites looking to build two new reactors each.[79] Specifically, PEF is looking to build two new reactors *inland* in Levy County, Florida,[80] while FPL is exploring plans to expand its *coastal* Turkey Point facility with the addition of Units 6 and 7.[81] If the NRC and the State of Florida both approve these plans, Florida's nuclear reactor count will grow to nine, with only two of Florida's nine reactors more than two miles from the coast.[82]

IV. The Permitting Process For New Nuclear Reactors

A. Federal Permitting and Approval

1. The Current Process

The NRC is the federal agency tasked with protecting "the health and safety of the public and the environment by regulating the design, siting, construction, and operation of new commercial nuclear power facilities."[83] In carrying out this mission, the NRC requires a two-step process for obtaining an operating license for a new nuclear reactor: (1) a construction permit (to build the plant), and (2) an operating license.[84] Prior to applying for an initial construction permit, the applicant has the option to apply for an "early site review permit" (ESP).[85] If the applicant does not pursue an ESP, the first step, as mentioned above, is the construction permit application,[86] which

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[78] U.S. EIA, *Status of Potential New Commercial Nuclear Reactors in the United States* (Release date July 1, 2010), http://www.eia.doe.gov/cneaf/nuclear/page/nuc_reactors/reactorcom.html.
[79] *Id.*
[80] Progress Energy, *Nuclear Construction*, https://www.progress-energy.com/company/electricity-system/power-plants/nuclear-construction.page?.
[81] U.S. EIA, *supra* note 78; FPL, *Turkey Point Frequently Asked Questions*, http://www.fpl.com/environment/plant/turkey_point_faq.shtml.
[82] In contrast to the coastal reactor sites at Crystal River (current), St. Lucie (existing), and Turkey Point (existing and proposed), Progress Energy's Levy County site (proposed) is approximately seven miles inland. Progress Energy, *supra* note 80.
[83] U.S. NRC, *New Reactors*, http://www.nrc.gov/reactors/new-reactors.html. At the federal level, permits and approvals needed prior to construction of a new reactor include: (1) National Pollutant Discharge Elimination System permit, (2) Prevention of Significant Deterioration (PSD) permit, (3) U.S. Nuclear Regulatory Commission approval, and the (4) U.S. Army Corps of Engineers approval. Fla. DEP Press Release, *supra* note 12.
[84] *See generally* 10 C.F.R. § 50.30. *See also* U.S. NRC, *Nuclear Power Plant Licensing Process*, NUREG/BR-0298, Rev. 2, at 2 (Jul. 2004), *available at* http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0298/br0298r2.pdf.
[85] U.S. NRC, *supra* note 84, at 2.
[86] *Id.*

requires a Preliminary Safety Analysis Report (PSAR),[87] Environmental Report (ER),[88] and financial and antitrust statements.[89] If the NRC grants a construction permit, the applicant then submits an application for the operating license at some point during the construction of the plant.[90] The operating license application consists of a final safety analysis report (FSAR)[91] and an updated ER.[92]

Per NRC rule amendments in 1989, an applicant also has the option of submitting an application for a construction permit *and* an operating license in what is known as a "combined license" (COL application).[93] According to the NRC, the COL application contains "essentially the same information required in an application for an operating license issued under 10 C.F.R. Part 50."[94] Ultimately, and regardless of what part of the process an applicant chooses to submit the required documentation, the applicant's ER satisfies NEPA[95] obligations and assists the NRC

[87] 10 C.F.R. § 50.34 (requiring that "[e]ach application for a construction permit shall include a preliminary safety analysis report" and setting forth the minimum requirements).

[88] 10 C.F.R. § 50.30(f) states: "An application for a construction permit, operating license, early site permit, combined license, or manufacturing license for a nuclear power reactor, testing facility, fuel reprocessing plant, or other production or utilization facility whose construction or operation may be determined by the Commission to have a significant impact in the environment, shall be accompanied by an Environmental Report required under subpart A of part 51 of this chapter." *See also* 10 C.F.R. § 51.45(c) (providing the requirements of the Environmental Report); 10 C.F.R. § 51.50(a); 10 C.F.R. § 51.14(a) ("Each applicant for a permit to construct a production or utilization facility covered by § 51.20 shall submit with its application a separate document, entitled 'Applicant's Environmental Report–Construction Permit Stage.'"); 10 C.F.R. § 50.36b; U.S. NRC, *supra* note 84, at 2.

[89] U.S. NRC, *supra* note 84, at 2. An explanation for the need of the power plant is also required as part of the construction permit application. *Id.*

[90] 10 C.F.R. § 50.30(d). *See also* U.S. NRC, *supra* note 84, at 2.

[91] 10 C.F.R. § 50.34(b) (stating that "[e]ach application for an operating license shall include a final safety analysis report" and setting forth the minimum requirements).

[92] 10 C.F.R. § 50.30(f); U.S. NRC, *supra* note 84, at 2.

[93] *See* 10 C.F.R. Part 52. "Combined license means a combined construction permit and operating license with conditions for a nuclear power facility issued under subpart C of this part." 10 C.F.R. § 52.1(a). *See also* 10 C.F.R. § 50.23; 10 C.F.R. § 52.79(a) ("The application must contain a final safety analysis report that describes the facility, presents the design bases and the limits on its operation, and presents a safety analysis of the structures, systems, and components of the facility as a whole."); 10 C.F.R. § 51.50(c) (requiring an ER as part of the combined license stage).

[94] U.S. NRC, *supra* note 84, at 1. *See also* 10 C.F.R. § 50.30(f) (requiring Environmental Report); 10 C.F.R. § 50.30.

[95] The National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321-4327, is administered by the Council on Environmental Quality. Council on Environmental Quality (CEQ), *The Council on Environmental Quality – About*, http://www.whitehouse.gov/administration/eop/ceq/about.

in issuing an environmental impact statement (EIS),[96] while the FSAR satisfies Atomic Energy Act (AEA)[97] safety obligations, and aids the NRC in issuing a Final Safety Evaluation Report (FSER).[98] Stated differently, the applicant's ER informs the NRC's EIS in compliance with NEPA, while the applicant's FSAR informs the NRC's FSER to comply with the AEA.[99]

To date, NRC Rules and Regulatory Guides have yet to *expressly* require a climate change and/or sea level rise analysis from new reactor applicants, which means that, arguably, neither analyses are mandatory within an applicant's FSAR and ER. And equally unclear is the extent to which the NRC staff can (or should) consider climate change and sea level rise as part of its own internal review of an application – the environmental review, i.e., NEPA-driven EIS, and/or the safety review, i.e., AEA-driven FSER. But even though the NRC has yet to issue a definitive climate change policy, NRC rules *do* require site characteristics to be examined as part of the AEA's safety analysis (i.e., applicant's FSAR and the NRC's FSER).[100] Per NRC rules, specific site evaluation factors include: (1) population density and use characteristics of the surrounding environment, (2) the nature and proximity of man-related hazards (e.g., airports, dams, transportation routes, military and chemical facilities), and (3) physical characteristics of the site, including seismology, meteorology, geology, and hydrology.[101] Specifically, 10 C.F.R. § 100.20(c) requires the NRC to take the following factors into consideration in determining the acceptability of a site for a stationary power reactor:

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[96] 10 C.F.R. § 51.14(a) states: "Environmental report means a document submitted to the Commission by an applicant for a permit, license, or other form of permission, or an amendment to or renewal of a permit, license or other form of permission, or by a petitioner for rulemaking, in order to aid the Commission in complying with section 102(2) of NEPA." *See also* 10 C.F.R. § 51.45 ("The environmental report should contain sufficient data to aid the Commission in its development of an independent analysis."); 10 C.F.R. § 51.45(c) (requiring the environmental report to contain a description of the proposed action, a statement of its purposes, a description of the environment affected, and a discussion of NEPA-related impacts, effects, and alternatives). However, only if the applicant opts for an early site permit must the NRC directly integrate the ER. 10 C.F.R § 51.14(a).

[97] The Atomic Energy Act of 1954, 42 U.S.C. § 2011 et seq., is administered by the U.S. Nuclear Regulatory Commission. "Under the Atomic Energy Act of 1954, a single agency, the Atomic Energy Commission [the NRC's predecessor], had responsibility for the development and production of nuclear weapons and for both the development and the safety regulation of the civilian uses of nuclear materials. [However, the Energy Reorganization Act of 1974, 42 U.S.C. 5801 et seq.,] split these functions, assigning to one agency, now the Department of Energy, the responsibility for the development and production of nuclear weapons, promotion of nuclear power, and other energy-related work, and assigning to the NRC the regulatory work, which does not include regulation of defense nuclear facilities." U.S. NRC, *Our Governing Legislation*, http://www.nrc.gov/about-nrc/governing-laws.html.

[98] U.S. NRC, *Fact Sheet – Nuclear Power Plant Licensing Process* 2 (Sept. 2010) (describing AEA and NEPA obligations for an applicant and the NRC for new reactor permitting), *available at* http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/licensing-process-fs.pdf.

[99] *Id.*

[100] 10 C.F.R. § 52.1(a) ("Site characteristics are the actual physical, environmental and demographic features of a site. Site characteristics are specified in an early site permit or in a final safety analysis report for a combined license.").

[101] *Id.* § 100.20.

> (c) Physical characteristics of the site, including seismology, meteorology, geology, and hydrology.
>
> (1) Section 100.23, "Geologic and seismic siting factors," describes the criteria and nature of investigations required to obtain the geologic and seismic data necessary to determine the suitability of the proposed site and the plant design bases.
>
> (2) Meteorological characteristics of the site that are necessary for **safety analysis** or that may have an impact upon plant design (such as maximum probable wind speed and precipitation) must be identified and characterized.
>
> (3) Factors important to hydrological radionuclide transport (such as soil, sediment, and rock characteristics, adsorption and retention coefficients, ground water velocity, and distances to the nearest surface body of water) must be obtained from on-site measurements. **The maximum probable flood along with the potential for seismically induced floods discussed in § 100.23(d)(3) must be estimated using historical data.**[102]

Further, 10 C.F.R. Part 50 Appendix A (General Design for Nuclear Power Plants) states:

> Criterion 2 – Design bases for protection against natural phenomena. Structures, systems, and components important to **safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions**. The design bases for these structures, systems, and components shall reflect: (1) Appropriate consideration of the most severe of the natural phenomena that have been **historically reported** for the site and surrounding area, with sufficient margin for the limited accuracy, quantity, and period of time in which the historical data have been accumulated, (2) appropriate combinations of the effects of normal and accident conditions with the effects of the natural phenomena and (3) the importance of the safety functions to be performed.[103]

In linking "safety concerns" to "protection against natural phenomena," Criterion 2 (GDC 2) reinforces the NRC's apparent stance that natural disasters, including floods, are more a part of the AEA's safety obligations rather than a part of the NEPA process.[104] *Historical* flooding, i.e., last century, is a highly scrutinized aspect of the safety review as the NRC's rules go to great lengths to assess the potential for flooding with special attention given to seismically induced floods (e.g.

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[102] *Id.* § 100.20(c) (emphasis added). *See also* 10 C.F.R. § 100.23.

[103] 10 C.F.R. Part 50 Appendix A, Criterion 2 (emphasis added).

[104] Interestingly, although Criterion 2 is focused specifically at "[protecting] against natural phenomena," it relies wholly upon "historical data," which would not lead to any significant conclusions related to climate-induced sea level rise. This stance is further reinforced by the lack of consideration of natural disasters within the contents of the ER requirements. *See* 10 C.F.R. Part 50.

earthquake induced tidal waves).[105] However, the apparent mandated reliance on *historical* data in the NRC's flood analysis reveals a significant weakness in the NRC's flood-safety regulations as any attempt to use such data in a *future* sea level rise analysis would seemingly result in a gross underestimate due to the potential for accelerated sea level rise.

2. Climate Change Meets Federal Nuclear Permitting

As of 2011, the intersection of climate-change science and U.S. nuclear energy policy is emerging – policymakers (and nuclear power advocates) are rushing to build new reactors as a climate mitigation mechanism to phase out fossil fuel plants[106] without considering climate adaptation as it relates to nuclear power, i.e., the ability of nuclear energy infrastructure to withstand and/or adapt to the impacts of climate change and sea level rise.[107] And even though nuclear power is typically viewed as a more climate-friendly form of energy when compared to its fossil fuel counterparts,[108] many skeptics of nuclear power still point out the drawbacks in a renewed interest and reliance upon nuclear power (including the lack of a long-term solution for the waste).[109] Ultimately, the development of a climate-friendly energy policy, including whether to build new reactors at coastal locations, will require a broad perspective that considers both (1) climate mitigation (i.e., how to limit the impacts of current and future power plants on the environment as climate change creators) *and* (2) climate adaptation – the ability of plant

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[105] *See* U.S. NRC Regulatory Guide 4.7 (*General Site Suitability Criteria for Nuclear Power Stations*) (Apr. 1998); Regulatory Guide 1.70 (*Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants – Section* 2.40) (Nov. 1978); U.S. NRC Regulatory Guide 1.59 (*Design Basis Floods for Nuclear Power Plants*) (Aug. 1977), http://www.nrc.gov/reading-rm/doc-collections/reg-guides/environmental-siting/rg/. *See also* 10 C.F.R. § 100.20(c) ("The maximum probable flood along with the potential for seismically induced floods discussed in § 100.23 (d)(3) must be estimated using historical data.").

[106] *See* IAEA, CLIMATE CHANGE AND NUCLEAR POWER I (2009) ("Climate change mitigation is one of the salient reasons for increasingly considering nuclear power in national energy portfolios."), *available at* http://www.iaea.org/OurWork/ST/NE/Pess/assets/09-43781_CCNP-Brochure_E.pdf; Deutch, *supra* note 11, at 4 (acknowledging that as of 2009, "[c]oncern with avoiding the adverse consequences of climate change has increased significantly in the past five years.").

[107] *See, e.g.,* Kopytko & Perkins, *supra* note 60.

[108] According to Progress Energy, "[n]uclear power is a clean source of electric power generation. Electric power generation from nuclear fuel produces no sulfur dioxide (SO_2), nitrogen oxide (NO_2), green house gases (GHG), or other emissions. Therefore, it will have a positive effect on the surrounding air quality." PROGRESS ENERGY FLORIDA, TEN-YEAR SITE PLAN AS OF DECEMBER 31, 2009, 4-3 (April 1, 2010). *See also* Fla. PSC, *supra* note 55 (enacting rules to encourage nuclear energy expansion in Florida); IAEA, *supra* note 107; IAEA, CLIMATE CHANGE AND NUCLEAR POWER 1 (IAEA 2000) (finding that because nuclear power produces virtually no GHG emissions, it could be an important part of future strategies to reduce GHG emissions), *available at* http://www.iaea.org/Publications/Booklets/ClimateChange/climate_change.pdf.

[109] *See Nuclear Waste/"Fast Breeder" Reactor - Study: Problem-Plagued Reactor No Solution to Long-Term Nuclear Waste Problem*, SALEM-NEWS.COM, Feb. 17, 2010, *available at* http://www.salem-news.com/articles/february172010/fast_reactors.php; Benjamin Spillman, *Is Nuclear Waste Reprocessing in Nevada's Future*, THE ELY TIMES, Feb. 11, 2010, *available at* http://www.elynews.com/articles/2010/02/11/news/news12.txt. *But see* IAEA, *supra* note 106, at 65 (concluding that although the future of Yucca Mountain as the ultimate disposal site for spent fuel is uncertain. Experts agree that spent fuel can be safely stored in dry storage casks for many decades.).

infrastructure to withstand the environmental impacts of climate-change (e.g., earthquakes, floods, changing salinity, sea level rise, etc.). To minimize risks involved with building new reactors, regulators and industry must definitively decide the extent to which uncertain climate change and sea level rise science can, and should, be integrated into new reactor location and permitting decisions.

Within this context, NEPA is on the front line of a developing U.S. energy policy that is attempting to incorporate climate change science. In early 2010, the Council of Environmental Quality (CEQ), as the agency charged with overseeing NEPA, issued a memorandum to Heads of Federal Departments and Agencies entitled, "Draft NEPA Guidance On Consideration Of The Effects Of Climate Change And Greenhouse Gas Emissions."[110] Although the NRC has yet to undergo rulemaking to integrate climate change science and policies, the CEQ's latest draft NEPA guidance appears to provide the NRC with at least an initial path for (1) integrating climate change science into the permitting process for new reactors and (2) updating outdated regulatory guidance documents.

In the interim, a trend is emerging. Environmental interests have recently attempted to intervene in COL proceedings to force applicants to address climate change impacts within the contents of the applicant's ER.[111] Upon receiving referrals from the NRC's Atomic Safety & Licensing Boards (ASLB) in both *In re Duke Energy Carolinas, LLC* (i.e., COL Application for Duke Energy's William States Lee III Nuclear Station, Units 1 and 2, in South Carolina), and *In Re Tennessee Valley Authority* (i.e., COL Application for TVA's Bellefonte Nuclear Power Plant, Units 3 and 4, in Alabama), the NRC Commissioners issued CLI-09-21, Memorandum and Order, which considered the admissibility of two contentions "concerning the consideration in COL applications of certain environmental impacts relevant to greenhouse gas emissions" for Duke Energy and TVA's respective applications.[112] Although declining to review the ASLB rulings, the NRC Commissioners noted the inclusion of a "Global Warming, Climate Change, and Greenhouse Gas Impacts" section as part of the NRC's Draft Supplemental Environmental Impact

[110] Council on Environmental Quality, Memorandum For Heads Of Federal Departments And Agencies, Draft NEPA Guidance On Consideration Of The Effects Of Climate Change And Greenhouse Gas Emissions (Feb. 18, 2010), *available at* http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf. *See also* National Environmental Policy Act Draft Guidance, Consideration of the Effects of Climate Change and Greenhouse Gas Emissions, 75 Fed. Reg. 8046 (Feb. 23, 2010).

[111] Memorandum and Order, In re Duke Energy Carolinas, LLC, CLI-09-21, at 2 (N.R.C. Nov. 3, 2009) (acknowledging environmental intervenors' argument that TVA failed to include in its environmental report (1) "an analysis of the emission of [g]reenhouse gases in the process of the production of raw materials and components, and the transportation of these materials and components and the construction processes required to build Bellefonte 3 [and] 4;" and (2) an analysis of greenhouse gas emissions associated with each step in the uranium fuel cycle, including reprocessing."), *available at* http://www.nrc.gov/reading-rm/doc-collections/commission/orders/2009/2009-21cli.pdf.

[112] *Id.* at 5 n. 16.

Statement (DSEIS)[113] for the North Anna Power Station Unit 3, and, in turn, provided the following guidance:

> We expect the [NRC] Staff to include consideration of carbon dioxide and other greenhouse gas emissions in its environmental reviews for major licensing actions under the National Environmental Policy Act. The Staff's analysis for reactor applications should encompass emissions from the uranium fuel cycle as well as from construction and operation of the facility to be licensed. The Staff should ensure that these issues are addressed consistently in agency NEPA evaluations and, as appropriate, update Staff guidance documents to address greenhouse gas emissions.[114]

On April 8, 2010, the NRC staff responded by issuing an internal memorandum entitled Supplemental Guidance to NUREG 1555: Environmental Standard Review Plan for Consideration of the Effects of Greenhouse Gases and of Climate Change (Supplemental Guidance) with a stated purpose to "clarify the consideration of greenhouse gas (GHG) emissions and the treatment of climate change in developing draft environmental impacts statements (EISs) for new reactor reviews."[115] However, in apparently preempting the applicability of NEPA as means to assess climate change adaptation for a new reactor, an NRC cover letter to the Supplemental Guidance expressly sets forth that "**the change in climate may affect safe design or operation of a facility**; this aspect should be treated as part of the **safety review, not the environmental review [NEPA]**."[116] In further clarifying this new NRC policy, the Supplemental Guidance states:

> For some Federal agencies, it may be entirely appropriate for their EISs to consider "public health and safety." As a regulatory agency with its organic statute principally focused on public health and safety, the NRC's responsibilities under the Atomic Energy Act already include consideration of natural phenomena on the safe design and operation of reactors. Public health is considered as part of the NRC's NEPA review as well, but public safety is

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[113] Section 5.11, Global Warming, Climate Change, and Greenhouse Gas Impacts, of the Duke Energy DSEIS states: "While there is general agreement in the scientific community that some change in climate is occurring, considerable uncertainty remains in the magnitude and direction of some of the changes. In light of these uncertainties, balancing society's need for electricity and water under an altered climate is not now feasible and would amount to speculation … The impacts of global warming and climate change from the operation of the proposed Unit 3 at the NAPS site are negligible at the global level … Consequently, the environmental impacts associated with the effects of greenhouse gas emissions from the operation of a base-load power plant are unique between a fossil fuel and nuclear plant." Draft Supplemental Environmental Impact Statement for the Combined License (COL) for North Anna Power Station Unit 3, NUREG-1917 (Dec. 2008), § 5.11, Global Warming, Climate Change, and Greenhouse Gas Impacts, 5-49–5-50, ADAMS Accession No. ML093070690, http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1917/. [hereinafter North Anna Draft SEIS]. *See also* In re Duke Energy Carolinas, LLC, CLI-09-21, 5 n. 16. (acknowledging that the NRC's draft SEIS for the North Anna Power Station Unit 3 COL application addressed global warming concerns to some extent).

[114] In re Duke Energy Carolinas, LLC, CLI-09-21, at 5-6.

[115] In re Turkey Point, Case No.52-040-COL, 52-041-COL, Exhibit 5.18 - Supplemental Guidance to NUREG-1555, at 1, Adams Accession No. ML102740609 [hereinafter Turkey Point Exhibit 5.18].

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

> considered in the NRC's safety evaluation reports (SERs) developed concomitant with its EIS for the regulatory action.[117]

As for the environmental impacts of the reactor on the environment, i.e., climate mitigation, the Supplemental Guidance states:

> For new reactor licensing actions where an EIS is being prepared to fulfill its responsibilities under NEPA, the NRC Staff should consider certain aspects of climate change. **These aspects include (1) the potential impacts of the proposed action on the environment and (2) the changes in significant resource areas that may occur during the lifetime of the proposed action as a result of a changing climate**. In addition to the direct effects of the action, the Staff considers the indirect and cumulative effects of the proposed action and alternatives (sites and energy sources) to the proposed action. **The Staff should now consider changes in climate that may occur during the period of the proposed action on susceptible environmental resources; the Staff should consider air and water resources, ecological resources, and human health issues as the areas to consider the effects of climate change for new reactor applications**.[118]

Thus, it appears that the NRC is willing to use NEPA to assess climate mitigation (as part of the applicant's ER and the NRC's EIS analysis under NEPA), and to recognize that climate change can affect the environment.[119] Further, the NRC's express adoption of the scientific findings of the USGCRP reflects a new trend in U.S. climate change policy.[120] The NRC Supplemental Guidance states:

> These statements [EPA Administrator's Endangerment Finding] support the NRC Staff's view that assessments such as the June 2009 USGCRP report on impacts of climate change in the United States represent appropriate source material to be used for framing resource issues associated with climate change. The NRC Staff is responsible for the reliability of all information used in developing its EISs (10 FR 51.70); at this time, **the Staff finds that the information in the USGCRP report [i.e., 3 foot-plus rise in sea level by 2100] is of high quality and that the report is a reliable source for information regarding climate change in the U.S. As discussed below, the Staff notes that the Council on Environmental Quality (CEQ) also relies on the USGCRP report in its proposed guidance.** The Staff will

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[117] *Id.* at 9. Whether such a policy is ripe for a legal challenge is another subject altogether. *See, e.g.,* Limerick Ecology Action, Inc. v. U.S. NRC, 869 F.2d 719, 723 (3d. Cir. 1989) ("We are confronted at the outset by the NRC's contention that by making decisions under the Atomic Energy Act, 42 U.S.C. §§ 2011 to 2282 (1982) ("AEA"), it has precluded the need for consideration of environmental implications under NEPA. Because we conclude that consideration under NEPA should not be precluded by the AEA, we must address [plaintiff's] specific contentions.").

[118] Turkey Point Exhibit 5.18, *supra* note 115, at 10 (emphasis added).

[119] North Anna Draft SEIS, *supra* note 113, at § 5.11, Global Warming, Climate Change, and Greenhouse Gas Impacts, 5-49–5-50.

[120] USGCRP Report, *supra* note 29.

> continue to monitor the development of EPA and CEQ positions and their reliance on the USGCRP report.[121]

As highlighted in the introduction of this Article, formulating sound policy from uncertain science is extremely difficult, and the Supplemental Guidance gives much needed insight into the NRC's attempt at doing so. And although the Supplemental Guidance clearly acknowledges that the NRC is following the CEQ and EPA's lead in apparently looking to integrate climate change science into the NEPA review process, i.e., applicant's ER and the NRC's EIS, it is also important to recognize that the NRC chose to expressly limit the scope of the Supplemental Guidance to NEPA compliance. This reinforces the NRC's apparent stance that *safety* concerns related to climate change, including flooding and sea level rise, are *not* a part of the environmental review (i.e., NEPA analysis).[122]

As for the extent to which the NRC will similarly adopt the USGCRP's findings (i.e., 3 foot-plus sea level rise by 2100) as part of the AEA's safety review, a 2008 letter from Representative Edward J. Markey, Chairman of the now defunct Select Committee on Energy Independence and Global Warming, spurred a highly interesting NRC response.[123] Specifically, in answering Rep. Markey's request, i.e., how the impacts of climate change might affect "the continued safe operation of U.S. nuclear power plants and spent fuel storage installations," the NRC provided the following:

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[121] Turkey Point Exhibit 5.18, *supra* note 115, at 4 (emphasis added). The reference to the EPA Administrator's Endangerment Finding, as adopted within the contents of the Supplemental Guidance, states in part: "The release of the U.S. Global Climate Research Program (USGCRP) [formerly the Climate Change Science Program (CCSP)] report on impacts of climate change in the United States in June 2009 ... synthesized information contained in prior CCSP reports and other synthesis reports, many of which had already been published ... [and undergo a rigorous and exacting standard of peer review by the expert community, as well as rigorous levels of U.S. government review and acceptance ... The review processes ... provide EPA with strong assurance that this material has been well vetted by both the climate change research community and by the U.S. government.]. These assessments therefore essentially represent the U.S. government's view of the state of knowledge on greenhouse gases and climate change. For example, with regard to government acceptance and approval of IPCC assessment reports, the USGCRP Web site states that: 'When governments accept the IPCC reports and approve their Summary for Policymakers, they acknowledge the legitimacy of their scientific content.' It is the Administrator's view that such review and acceptance by the U.S. Government lends further support for placing primary weight on these major assessments." Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Rule, 74 Fed. Reg. 66,496, 66,504 (Dec. 15, 2009) (to be codified at 40 C.F.R. Chapter I); Turkey Point Exhibit 5.18, *supra* note 115, at 3 (quoting the EPA Administrator's Endangerment Finding). *See also* North Anna Draft SEIS, *supra* note 113, at § 5.11, Global Warming, Climate Change, and Greenhouse Gas Impacts, 5-49 (demonstrating the NRC's staff use of a 2000 report of the USGCRP and the IPCC Climate Change AR4 Synthesis Report of 2007 in considering the potential impact of climate change on water supply).

[122] As for the NRC's future climate change policies related to NEPA, the Supplemental Guidance expresses that the NRC will likely issue an update to its Environmental Standard Review Plan. Turkey Point Exhibit 5.18, *supra* note 115, at 3. *See also* U.S. NRC, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Environmental Standard Review Plan* (NUREG-1555), *available at* http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1555/.

[123] U.S. NRC Letter, *supra* note 56, at cover page.

> Currently, NRC staff is working directly with IPCC scientists, as well as scientists from the World Meteorological Organization (WMO) and from the International Atomic Energy Agency (IAEA), to update regulatory guidance for the IAEA, expected to be published in 2010. This guidance will directly address climate change issues and will describe tools and methods for incorporating sea level rise and meteorological phenomena into safety assessments for nuclear facilities**. This guidance will also be incorporated into a revision to NRC Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants," expected to be published in 2011.** As a result, the latest information from the IPCC and WMO are being directly incorporated into NRC guidance on flooding.[124]
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> ***
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> Based on NRC's activities related to climate change, and the relatively slow rate of this change, NRC is confident that any regulatory action that may be necessary will be taken in a timely manner to ensure the safety of all nuclear facilities regulated by the NRC.[125]

Interestingly, five years earlier (in 2003), the IAEA released "Flood Hazard for Nuclear Power Plants on Coastal and River Sites: Safety Guide" (IAEA Flood Safety Guide), which recommended a mean sea level rise safety margin of 35 to 85 centimeters (1.15 to 2.79 feet) over the lifetime of a plant.[126] As of 2011, eight years after the IAEA's sea level rise recommendations regarding flood safety concerns [127] and five years after the NRC reassured Rep. Markey, the NRC flood regulations and guidance have yet to be updated. To date, neither the IAEA update nor NRC Regulatory Guide 1.59 (RG 1.59) update have been officially released, which means that severely antiquated NRC rules continue to govern flood safety concerns for new reactor applications.[128] Thus, until the NRC officially amends RG-1.59 in late 2011 and/or undergoes notice-and-comment rulemaking, an applicant's FSAR and the NRC's FSER for all pre-2011 coastal reactor applications will likely severely underestimate the potential for accelerated sea level rise.

B. State and Local Permitting and Approval

At the state level, the Florida Electrical Power Plant Siting Act (PPSA), §§ 403.501-.518, Florida Statutes, governs Florida's centralized process for licensing large power plants (including

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[124] *Id.* at 1.

[125] *Id.* at 2.

[126] IAEA, *supra* note 33, §§ 14.9–14.10, at 72. Section 14.10 states: "Some safety margin should be taken into consideration in the design of a nuclear power plant. If periodic safety reviews are conducted, such a margin may refer to the interval between two consecutive reviews. **If the entire plant lifetime is considered, the following generally agreed estimated variations in parameters may be considered: … Rise in mean sea level: 35–85 cm [1.15 to 2.79 feet].**" (emphasis added).

[127] According to Mohamed ElBaradei, Director General of the IAEA: "The IAEA's safety standards are not legally binding on Member States but may be adopted by them, at their own discretion, for use in national regulations in respect of their own activities. The standards are binding on the IAEA in relation to its own operations and on States in relation to operations assisted by the IAEA." IAEA, *supra* note 33.

[128] The most recent published update to RG 1.59, Design Basis Floods for Nuclear Power Plants, occurred in August 1977. NRC, *NRC Regulatory Guides – Power Reactors (Division I)*, http://www.nrc.gov/reading-rm/doc-collections/reg-guides/power-reactors/rg/.

nuclear reactors),[129] a process that operates independently of the federal licensing process.[130] Although local governments and multiple state agencies participate in this process,[131] one license – a certification – supersedes other local and state permits.[132] Accordingly, the Florida Department of Environmental Protection (DEP) touts the state certification process as an "an all encompassing license for affected state, regional and local agencies, and includes any regulatory activity which would be applicable under these agencies' regulations for the facility."[133] Thus, the PPSA certification goes well beyond merely providing approval for the location of the power plant. It also provides certification requirements for the plant's associated facilities (e.g., natural gas pipeline, rail lines, roadways, and electrical transmission lines),[134] and addresses "permitting, land use and zoning, and property interests."[135] Over the course of the certification process, DEP's Siting Coordination Office and Office of General Counsel provide crucial administrative and legal support,[136] and although DEP is responsible for coordinating interagency review, the Governor and Cabinet ultimately issue site certifications once DEP has concluded the review process.[137]

C. *Florida's Proposed Reactors*

1. Levy County Construction (Units 1 & 2) – Progress Energy Florida

PEF's plans to build new reactors in Florida date back to 2005.[138] Two years later (in 2007), PEF notified the NRC and the public that its planned expansion would consist of two new units (Units 1 and 2) in Levy County, Florida.[139] Fortunately, the 3,100-acre Levy County site[140] is located about seven miles *inland* from the Gulf of Mexico, and approximately eight miles north of

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[129] FLA. STAT. § 403.503(14) states in part: "'Electrical power plant' means, for the purpose of certification, any steam or solar electrical generating facility using any process or fuel, including **nuclear materials**, except that this term does not include any steam or solar electrical generating facility of less than 75 megawatts in capacity unless the applicant for such a facility elects to apply for certification under this act." (emphasis added).

[130] DEP, *Siting Coordination*, http://www.dep.state.fl.us/siting/.

[131] DEP, *Power Plant Siting Act*, http://www.dep.state.fl.us/siting/power_plants.htm.

[132] *Id.*

[133] Fla. DEP, *supra* note 130.

[134] Fla. DEP, *supra* note 131. Section 403.503(14), Florida Statutes, states in part: "This term [Electrical power plant] also includes the site; all associated facilities that will be owned by the applicant that are physically connected to the site; all associated facilities that are indirectly connected to the site by other proposed associated facilities that will be owned by the applicant; and associated transmission lines that will be owned by the applicant which connect the electrical power plant to an existing transmission network or rights-of-way to which the applicant intends to connect."

[135] Fla. DEP, *supra* note 131.

[136] Fla. DEP, *supra* note 130.

[137] Fla. DEP, *supra* note 130; Fla. DEP, *supra* note 12.

[138] U.S. EIA, *supra* note 78.

[139] *Id.*; PROGRESS ENERGY FLORIDA, *supra* note 108, at 4-1.

[140] Units 1 and 2 (and supporting infrastructure) will only use approximately 10% of the 3,000-acre site. PROGRESS ENERGY FLORIDA, *supra* note 108, at 4-1.

the Progress Energy's Crystal River Energy Complex in Citrus County.[141] According to current plans, Units 1 and 2 will rely on cooling waters from the Florida Barge Canal.[142]

In March 2008, the Florida Public Service Commission gave PEF the first approval needed to move forward with plans to construct Units 1 and 2 at the Levy County site.[143] Three months later (in June 2008), PEF submitted a Site Certification Application (SCA) to DEP (state level),[144] followed by a combined license (COL) application submittal to the NRC (federal level).[145] Following the conclusion of DEP's review of the SCA in March 2009,[146] the Florida Siting Board at that time, i.e., Governor Charlie Crist, Attorney General Bill McCollum, and Chief Financial Officer Alex Sink, unanimously approved the Site Certification for Levy County's Units 1 and 2 on August 11, 2009.[147] The DEP's Conditions of Certification for Units 1 and 2 were most recently updated on January 25, 2011.[148] In April 2010, PEF submitted to the PSC a Ten-year Site Plan, which provided the following insight into the selection of the Levy County site:

> This site was chosen based on several considerations including availability of land and water resources, access to the electric transmission system, and environmental considerations. First, the Levy County site had access to an adequate water supply. **Second, the site is at a relatively high elevation, which provides additional protection from wind damage and flooding**. Third, unlike a number of other sites considered, the Levy site has more favorable geotechnical qualities, which are critical to siting a nuclear power plant. **Fourth, the Levy site provides geographical separation from other electrical generating**

[141] Progress Energy, *supra* note 80.

[142] According to Progress Energy: "The site is about 2.5 miles from the Cross Florida Barge Canal, from which the Levy units may draw their makeup water to supply the on-site cooling water system. The Levy County Plant, together with the necessary associated site facilities, will occupy approximately ten percent of the 3,100-acre site and the remaining acreage will be preserved as an exclusionary boundary around the developed plant site and a buffer preserve. PEF purchased an additional 2,100-acre tract contiguous with the southern boundary of the Levy site that secures access to a water supply for the site from the Cross Florida Barge Canal as well as transmission corridors from the plant site. The property for many years had been used for silviculture and was designated as Forestry/Rural Residential. The surrounding area land use is predominantly vacant, commercial forestry lands. Progress Energy Florida, *supra* note 108, at 4-1.

[143] *New Levy Plant gets Approval*, WORLD NUCLEAR NEWS, July 16, 2008, http://www.world-nuclear-news.org/newsarticle.aspx?id=18882&terms=levy%20county%20progress%20energy. *See also* Fred Hiers, *Progress Nuclear Plant Fee Approved*, OCALA.COM, Oct. 26, 2010, http://www.ocala.com/article/20101026/ARTICLES/101029758.

[144] In Re: Progress Energy Florida Levy Nuclear Project Units 1 and 2, DOAH Case No. 08-002727-EPP (Case Closed May 15, 2009). *See also* PROGRESS ENERGY FLORIDA, *supra* note 108, at 4-2.

[145] U.S. EIA, *supra* note 14; U.S. EIA, *supra* note 12; U.S. NRC, *Combined License Application Documents for Levy County, Units 1 and 2 Application*, http://www.nrc.gov/reactors/new-reactors/col/levy/documents.html.

[146] In Re: Progress Energy Florida Levy Nuclear Project Units 1 and 2, DOAH Case No. 08-002727-EPP (Case Closed May 15, 2009). *See also* PROGRESS ENERGY FLORIDA, *supra* note 108, at 4-2.

[147] PROGRESS ENERGY FLORIDA, *supra* note 108, at 4-2.

[148] The DEP Conditions of Certification for Units 1 and 2 make no mention of climate change or sea level rise. *See* DEP, CONDITIONS OF CERTIFICATION: PROGRESS ENERGY FLORIDA LEVY NUCLEAR POWER PLANT, PA08-51C (Modified Jan. 25, 2011), *available at* http://www.dep.state.fl.us/siting/files/certification/pa08_51_2010_C.pdf.

> **facilities**. Even though the Crystal River Energy Complex site has many favorable qualities, **adding new nuclear generating capacity to the Crystal River Energy Complex at this time would result in a significant concentration of PEF's generating assets in one geographical location**. This increases the likelihood of a significant generation loss from a single event and a potential large-scale impact on the PEF system. The Levy County location also would assist in avoiding a potential loss from a single significant transmission system event that might result in a large-scale impact on the PEF system.
>
> ***
>
> The proximity of the Levy County site to the PEF's existing Crystal River Unit 3 nuclear plant provides opportunities for efficiencies in shared support functions.[149]

Arguably, PEF's concerns for flooding and geographic elevations reveal caution, and allude to an unspoken awareness of the risks of accelerated sea level rise during the next 100 years.[150] It is also important to highlight PEF's view that a newly sited *inland* reactor site is *not* overly burdensome for a utility company if it is sited relatively close to a current coastal reactor site, e.g., the Crystal River Energy Complex.[151]

With the majority of the state hurdles out of the way, PEF is working through the NRC's ongoing review process. Although PEF's COL application briefly mentions climate change mitigation in Chapters 8 and 10 of the ER,[152] its FSAR Section 2.3.1.3, "Effects of Global Climate Change on Regional Climatology" dismisses climate change adaptation altogether due to scientific

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[149] PROGRESS ENERGY FLORIDA, *supra* note 108, at 4-2 (emphasis added); Progress Energy, *supra* note 80 (listing "land, access to sufficient quantities of water (from the Gulf) and access to the electric transmission system, as well as an overall evaluation of environmental considerations" as the major siting criteria for the Levy County Site). At an October 23, 2010 public meeting, an NRC senior project manager supported the Levy County siting decision by reportedly suggesting that the decision to build at the Levy County site rather than Crystal River ultimately came down to a business decision by Progress Energy. The NRC project manager also reportedly echoed Progress Energy's belief that "separating the two nuclear plants would make business sense so that a major weather event could not take out both plants." Chris Van Ormer, *Man Doesn't Want Levy Nuke Plant as Neighbor Nuclear Regulatory Commission Takes Public Comments*, CEDAR KEY BEACON, Oct. 1, 2010. *See also* Progress Energy, *supra* note 80.

[150] Progress Energy, *supra* note 80.

[151] PROGRESS ENERGY FLORIDA, *supra* note 108, at 4-2.

[152] PEF, Environmental Report Part 3, Rev. 1, Ch.10, § 10.4.1.1 Need for Power, 10-63, and § 10.4.1.4.5 Air Pollution and Emissions Avoidance, 10-67–10-68 (Oct. 2, 2009) ("Given concerns in Florida and the rest of the south about climate change and carbon emissions, the LNP will serve another important need by reducing carbon emissions in the state. The LNP will displace significant amounts of carbon as soon as the plant becomes operational, as compared to a coal-fired generating plant."). S*ee also* PEF, Environmental Report Part 3, Rev. 1, Ch. 8, at 8-80 (Oct. 2, 2009).

uncertainty.[153] Stated differently, a climate change-related sea level analysis related to climate adaptation is simply nowhere to be found in either the Levy County ER or FSAR.[154] In response, the NRC looked to *General Design Criterion 2*,[155] 10 C.F.R. § 52.17, and 10 C.F.R. Part 100, and requested that PEF "explicitly state the value of the design basis flood in the FSAR including a description of any adjustment made for long-term sea level rise."[156] PEF's answer estimated a maximum sea level rise scenario of 1.99 mm/yr (0.39 feet over 60 years; 0.5876 feet by 2100; or 0.65 feet per century),[157] which would appear to severely underestimate sea level rise when compared to the USGCRP findings (i.e., 3 foot plus by 2100) and IAEA flood-safety recommendations (i.e., 1.15 to 2.79 feet over the lifetime of a plant).

On August 6, 2010, the NRC issued a Draft Environmental Impact Statement (DEIS) for the Levy County Site that echoes PEF's maximum sea level rise calculation (1.99 mm/yr) with the following:

> Adjustment to Long-term Sea Level Rise: The nearest tidal datum is located at Cedar Key, Florida, which is considered a valid estimate for the determination of long-term sea level rise affecting the coastline in the vicinity of the LNP site. The long-term sea level rise at Cedar Key, Florida, as provided by NOAA is 1.8 millimeters per year (mm/yr) with a 95 percent confidence interval of +/- 0.19 mm/yr. [link to website omitted]. Therefore, the

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[153] Section 2.3.1.3, "Effects of Global Climate Change on Regional Climatology" states: "Global trends in various meteorological and geophysical parameters are currently the subject of much discussion in both the scientific community and in the media. While it may be evident (and expected) that changes in the averages of certain meteorological parameters are occurring over time (i.e., such as temperature and precipitation), it is also evident and generally acknowledged that the prediction of any such changes are difficult if not impossible to reliably predict. **Even the most reliable climate change models are not capable of accurately predicting design basis extremes in weather patterns. A discussion of public concerns or speculations about climate change would not add to the resolution of these issues, nor would a discussion of changes in average global trends, because these data cannot be reviewed on a site-specific basis with any degree of accuracy or reliability.** It is relatively easy to demonstrate that an increase in the average value of temperature (or precipitation) at a given location is much more likely to be a result of numerous increases in temperatures (or precipitation) in the 'normal range' rather than increases in extreme values, because a change in a select number of extreme values will essentially have no measurable effect on longer term average values. Therefore, the information presented in this subsection of the FSAR is focused on the extreme meteorological conditions that will facilitate a plant design that will operate within these safety margins throughout the projected plant life of 40 to 60 years. This is accomplished by identifying historical extremes and projecting, in a scientifically defensible manner, the potential effects weather will have on the safety and operation of the LNP." PEF, Levy Nuclear Plant Units 1 and 2 COL Application Part 2, Final Safety Analysis Report, Rev. 0, § 2.3.1.3, 2.3-15 (Oct. 2, 2009) (emphasis added).

[154] Section 2.4.1 of PEF's FSAR specifies the pre-construction elevation of the footprints of LNP 1 and LNP 2 and associated facilities as varying between 12.5 m (41 ft.) and 14.9 m (49 ft.) NAVD88, and concludes that "[b]ased on historical water level observations, flooding of the LNP site is considered unlikely." Levy Nuclear Plant Units 1 and 2 COL Application Part 2, Final Safety Analysis Report Rev. 0, at 2.4-13.

[155] 10 C.F.R. Part 50 Appendix A, Criterion 2. *See infra* note 103 and accompanying text.

[156] Letter from Brian C. Anderson (U.S. NRC) to Garry Miller (Progress Energy Florida), Request for Additional Information Letter No. 045 Related to SRP Section 2.4.3 for the Levy County Nuclear Plant Units 1 and 2 Combined License Application, at 6 (May 19, 2009).

[157] *Id.* at 10.

> upper 95 percent confidence bound of sea level rise is 1.8 + 0.19 = 1.99 mm/yr. Considering a design period of 60 years for LNP 1 and LNP 2, the upper 95 percent estimate of sea level rise will be approximately 119.4 mm (0.39 ft.).[158]

But in demonstrating the NRC's Supplemental Guidance at work, the DEIS also states:

> On a longer-term scale, climate change is a subject of national and international interest. The recent compilation of the state of knowledge by the [USGCRP] has been considered in preparation of this EIS. **According to the [US]GCRP, it is reasonably foreseeable that sea-level rise may exceed 3 ft by the end of the century (GCRP 2009).** At a location, relative sea-level rise can have two components: (1) eustatic rise caused by absolute change in water volume of the oceans and (2) apparent rise in sea level caused by land subsidence. The increase in sea level would result in the saltwater front in the CFBC moving further inland.[159]

Thus, when compared collectively, the FSAR and DEIS both estimate sea level rise at 0.5876 feet by 2100 (based upon historical data collected by NOAA), while the DEIS simultaneously acknowledges a potential 3 foot-plus sea level rise by 2100 as "reasonably foreseeable" (according to the USGCRP). Detailing the unaccounted for negative impacts to Units 1 and 2 that potentially result from a long-term 2-3 foot rise in sea level is far beyond the scope of this Article, and in fact, the NRC's responsibility. But the fact that a "reasonably foreseeable" rise in sea level that is *five times* greater than the estimated rate (using historical data) is *not* integrated into PEF's FSAR, let alone the NRC's own DEIS, is concerning. The NRC's apparent reliance upon General Design Criteria 2 (GDC 2)[160] in using "historically reported" natural phenomena simply cannot be reconciled with accelerated sea level rise projections alluded to within the USGCRP report.

Considering that the IAEA addressed this very issue eight years ago in its Flood Safety Guide – projecting sea level rise of 1.15 to 2.79 feet over the lifetime of a plant – legitimate concerns arise over the NRC's pace at integrating new scientific information to adequately assess climate change impacts within the safety review. Only time will tell if the NRC's Final Safety Evaluation Report (FSER) – the final approval of the Levy County safety review – will similarly overlook the USGCRP's findings when it comes to the numbers used in the flood safety assessment. And if the current review process stays on schedule, the NRC anticipates issuing the FSER in April 2012.[161] If the NRC grants a construction permit, work will begin in 2016 at the earliest,[162] which means that

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[158] Draft Environmental Impact Statement for the Combined License (COL) for Levy Nuclear Plant Units 1 and 2, Draft Report for Comment, NUREG-1941 (Aug. 2010), § 2.3.1 Hydrology, 2-16.
[159] *Id.* (emphasis added).
[160] 10 C.F.R. Part 50 Appendix A, Criterion 2.
[161] U.S. NRC, *Levy County Nuclear Power Plant Units 1 and 2 Combined License Application – Revised Review Schedule*, Table 1 (Nov. 30, 2010), *available at* http://www.nrc.gov/reactors/new-reactors/col/levy/documents/nrc-2010.html.
[162] U.S. EIA, *supra* note 15.

Units 1 and 2 would go online around 2021 and 2023 respectively, [163] with a potential operating life extending to 2080 or beyond.[164]

2. Turkey Point Expansion (Units 6 & 7) – FPL

In 2006, FPL followed PEF's lead, and informed the NRC of its intent to apply for a combined license for two new units (Units 6 and 7) at Turkey Point.[165] In March 2008, the Florida PSC approved FPL's plans to construct Units 6 and 7,[166] and in June 2009, FPL submitted a Site Certification Application (SCA) to DEP, and a COL application to the NRC to build Turkey Point Units 6 and 7.[167] According to the federal EIA, FPL's COL application, dated June 30, 2009, was the only 2009 submittal to the NRC, and, therefore, a potential sign that the recent wave of new reactor applications has concluded.[168] Both DEP and the NRC are in the process of reviewing FPL's application.

a) Federal Review

FPL's COL application does account for sea level rise. Specifically, FPL's FSAR states:

> The long-term sea level rise trend at Miami Beach, Florida, as estimated based on data from 1931 to 1981, is **0.78 foot per century** (Reference 206). **Accordingly, a nominal long-term sea level adjustment of 1 foot is applied to the 10 percent high tide level resulting in an antecedent water level of 3.6 feet NAVD 88 (2.6 feet NAVD 88 + 1 foot)**, which represents the initial water level condition in the SLOSH model simulations.[169]

And FPL's ER addresses sea level rise as follows:

> Bathymetry variation within Biscayne Bay is shown on Figure 2.3-13. Long- and short-term shoreline change rates for the bay are not available. The average long-term rate of shoreline change for east Florida along the Atlantic coast shoreline is 0.2 ± 0.6 meter per year (0.66 ± 2.0 feet per year) (Morton and Miller 2005). This long-term shoreline rate of change is relatively small compared to shoreline changes for the other parts of the southeast Atlantic coast (Morton and Miller 2005). Shoreline changes within Biscayne Bay would be smaller than the rates for the Atlantic coast shoreline because the bay is protected from tide and

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[163] U.S. EIA, *supra* note 13.
[164] Peter Behr, *Experts Weigh Extending the Lives of Nuclear Power Plants to 80 Years*, NY TIMES, Sept. 20, 2010, *available at* http://www.nytimes.com/cwire/2010/09/20/20climatewire-experts-weigh-extending-the-lives-of-nuclear-71936.html.
[165] *Florida approves FPL plan for two more reactors*, WORLD NUCLEAR NEWS, March 19, 2008, http://www.world-nuclear-news.org/NN-Florida_approves_FPL_plan_for_two_more_reactors_190308.html.
[166] *Id.*
[167] U.S.EIA, *supra* note 13.
[168] *Id.*
[169] Turkey Point Units 6 & 7 COL Application Part 2 – FSAR, Revision 0, Section 2.4.5.2.2.1, Antecedent Water Level, at 2.4.5-6 (June 30, 2009), ADAMS Accession No. ML091870858 (emphasis added).

> wave actions by the barrier islands. **The long-term trends in sea level rise at Miami Beach, Vaca Key, and Key West, Florida are approximately 2.39 ± 0.43 millimeters/year (0.09 ± 0.017 inch per year) [*0.78 ± 0.14 foot per century*], 2.78 ± 0.6 millimeters/year (0.11 ± 0.024 inch per year), and 2.24 ± 0.16 millimeters per year (0.09 ± 0.006 inch per year), respectively (NOAA 2008f).** Because Units 6 & 7 would not use surface water from or discharge process water into Biscayne Bay, detailed sediment transport properties for the bay are not provided.[170]

Thus, according to FPL's ER and FSAR, historic sea level trends for Miami Beach convert to approximately 0.78 foot per century. Even so, an NRC site audit report requested the following information of FPL in relation to FSAR Section 2.4.5:

> ID #19 Information Needs: Provide an SME to discuss the basis for estimating (1) initial rise (also called forerunner or sea level anomaly) and (2) expected sea level rise over the life of the plant. Based on historical records, sea level is stated to have risen at a rate of 0.78 ft per century in the local area (Turkey Point Units 6&7 FSAR page 2.4.5-6). Provide an SME to discuss the various processes and phenomena that have combined to produce this net change in sea level, how this value was used in estimating initial rise and expected future sea-level rise, and **why it is considered to be appropriate for safety analyses to use 1.0 ft as a nominal long-term sea level adjustment for the future. Discuss how potential sea-level rise due to potential future climate change is accounted for in this analysis.**[171]

The NRC's site audit report documented FPL's response to ID#19 as follows:

> Applicant Response: Applicant explained the basis for initial rise and expected sea-level rise, including the conservatism in the estimates. **Applicant will provide discussion (for the updated FSAR) of future sea level rise relative to plant life expectancy, but will not discuss climate change *per se.*[172]**

The NRC's site audit report also addressed sea level rise concerns in the context of coastal erosion:

> ID #39 Information Needs: Provide an SME to discuss the uncertainty related to future shoreline changes, including (1) the potential for sea level rise due to future climate change to increase the rate of shoreline change and (2) the potential for erosion or inundation of the barrier islands that currently help to protect the site of Units 6 & 7 from wave action.[173]

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[170] Turkey Point Units 6 & 7 COL Application Part 3 – Environmental Report, Revision 0, Section 2.3.1.1.3, Biscayne Bay, at 2.3-9 (June 30, 2009), ADAMS Accession No. ML091870907 (emphasis added). *See also* Turkey Point Units 6 & 7 COL Application Part 3 – Environmental Report, Revision 1, Section 2.3.1.1.3, Biscayne Bay, at 2.3-9 (Sept. 3, 2010), ADAMS Accession No. ML102580468.

[171] U.S. NRC, Hydrology Safety Site Audit for Turkey Point COLA – Site Safety Audit Information Needs for Turkey Point COLA at 4 (Apr. 9, 2010) (emphasis added).

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

[173] *Id.* at 11-12.

And the NRC documented FPL's response to ID #39 with the following:

> Applicant Response: No discussion will be included about climate change based on applicants and NRC Counsel discussion as reported by the applicant. The discussion will be on sea level rise.[174]

While the context of this correspondence is limited, the message is clear – FPL has no intentions of accounting for climate-induced sea level rise beyond the one-foot per century assessment within its original COL application. FPL is unwavering in its position that climate-induced sea level rise is not a part of the NRC's flood safety analysis. Such a stance simply cannot be reconciled with the IAEA's 2003 Flood Safety Guide (i.e., 1.15 to 2.79 feet over the lifetime of a plant) and the USGCRP findings (i.e., 3 foot plus by 2100).

In September 2010, FPL submitted an updated FSAR that stood by its one-foot per century sea level rise estimate.[175] And not surprisingly, FPL has justified much of the FSAR's probable maximum surge and seiche flooding analysis upon RG 1.59, the antiquated NRC guide yet to be updated as of mid-2011.[176] Where the NRC ultimately stands on this issue will not likely be seen until it delivers an FSER for Units 1 and 2, which is presently scheduled for December 2012.[177]

As for the progress of the environmental review, in June 2010 the NRC published a notice of intent to begin to conduct information scoping for preparation of a DEIS.[178] Upon receiving an NRC invitation to participate in the EIS scoping process, the SFWMD recommended that the EIS consider:

> Hurricanes/Climate Change/Sea Level Rise: The potential for adverse impacts related to the siting and design of the proposed plant and associated facilities directly on the coast in an area subject to the direct effects of hurricane tidal surge, climate change, and sea level rise.[179]

And in response to a similar NRC invitation, the U.S. National Park Service (NPS) also expressed significant concerns related to flooding and sea level rise:

> Extreme flooding could cause significant flushing of contaminants into Biscayne Bay from the Cooling Canal system due to its lower elevation (i.e., 1 to 3 feet above sea level). NPS

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[174] *Id.*

[175] Turkey Point Units 6 & 7 COL Application Part 2 – FSAR, Revision 1, Section 2.4.5.2.2.1, Antecedent Water Level, at 2.4.5-6 (Sept. 9, 2010), ADAMS Accession No. ML102580413.

[176] *See id.*

[177] *See* U.S. NRC, *Application Review Schedule for the Combined License Application for Turkey Point, Units 6 and 7*, http://www.nrc.gov/reactors/new-reactors/col/turkey-point/review-schedule.html.

[178] U.S. NRC, Notice of Intent to Prepare and Environmental Impact Statement and Conduct Scoping Related to a Combined License Application for Turkey Point, Units 6 and 7 (June 9, 2010), ADAMS Accession No. ML101530683.

[179] Letter from South Fla. Water Mgmt. Dist. to U.S. Nuclear Regulatory Comm'n, Re: FPL Turkey Point Units 6 & 7 License Application Review Scoping Comments 7 (Aug. 16, 2010).

> does not believe the COL sufficiently analyzes or evaluates these hydrological and estuarine issues.[180]
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> 7. Climate Change/Sea Level Rise: The impacts of sea level rise due to climate change should be addressed as they pertain to the operation and maintenance of the RCWs and the hydrologic modeling, which is being used to forecast the percentage of water derived from Biscayne Bay versus freshwater from the Biscayne Aquifer. The effects of climate change should also address major storm events and cooling canal functionality over the projected lifespan of Units 6 & 7. Peer reviewed and governmental references should be part of this analysis, including the IPCC Fourth Assessment Report: Climate Change 2007; the Miami-Dade Climate Change 2007; and the **Army Corps of Engineers, engineering circular - sea level rise 1165-2-211**.[181]

The NPS reference to a U.S. Army Corps of Engineers (Corps or USACE) sea level rise policy becomes highly relevant when recognizing the NRC and Corps' relationship regarding new reactor permitting. Per a 2008 Memorandum of Understanding between the NRC and the Corps, the Corps is a "cooperating" agency on the environmental review of proposed reactors.[182] Although applicable *only* to civil works projects (rather than regulatory decisions related to nuclear licensing), on July 1, 2009 the Corps issued "Water Resource Policies and Authorities Incorporating Sea-level Change Considerations in Civil Works Programs, Circular No. 1165-2-211" (USACE Sea Level Rise policy). Specifically, the Corps' Sea Level Rise policy includes the following mandate for civil works projects:

> The planning and design of USACE water resource projects in and adjacent to the coastal zone must consider the potential for **future accelerated rise** in GMSL [Global Mean Sea Level] to affect the MSL [Mean Sea Level] trend. At the same time, USACE project planners and engineers must be aware of the historic trend in local MSL, because it provides a useful minimum baseline for projecting future change in local MSL. Awareness of the **historic** trend of local MSL also enables an assessment of the impacts that sea-level change may have had on regional coastal resources and problems in the past.[183]

Thus, although acknowledging the usefulness of *historical* data in estimating MSL, this new policy demonstrates that the Corps has stepped beyond such data to embrace the importance of

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[180] Letter from U.S. Nat'l Park Serv. to U.S. Nuclear Regulatory Comm'n, Re: Florida Power and Light Company Turkey Point Units 6 and 7 Combined License Application Review Scoping Comments 5 (Aug. 16, 2010).

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

[182] Memorandum of Understanding Between U.S. Army Corps of Engineers and U.S. Nuclear Regulatory Commission on Environmental Reviews Related to the Issuance of Authorization to Construct and Operate Nuclear Power Plants (Sept. 12, 2008), ADAMS Accession No. ML082540354. *See* Draft Environmental Impact Statement for the Combined License (COL) for Levy Nuclear Plant Units 1 and 2, Draft Report for Comment, NUREG-1941 (Aug. 2010), § 2.3.1 Hydrology, 4-1 to 4-2 (explaining the MOU relationship); *see also* NRC Regulatory Guide 4.2, Revision 2, Preparation of Environmental Reports for Nuclear Power Stations, NUREG-0099, vii (July 1976) (explaining the reasoning behind the MOU).

[183] USACE, *supra* note 8, at B-2 (emphasis added).

examining "the potential for future, accelerated [sea level] rise."[184] In contrast, the NRC's continued practice of looking to GDC 2 and RG 1.59, wholly relying upon strictly historical data, amounts to what the Corps would consider a "minimum baseline" of projecting mean sea level rise.

A DEIS scheduled for October 2011 may provide insight into (1) whether these agencies will provide independent and differing sea level projections, and/or (2) whether the NRC and the Corps will adopt FPL's suggested sea level rise estimate of one-foot per century.

b) State Review

At the state level, FPL's SCA similarly estimates sea level rise at one-foot rise per century. However, DEP, the South Florida Planning Council (SFPC), and the SFWMD have all expressed concerns that FPL's one foot per century assumption is inadequate, which has led to ongoing incompleteness determinations of the Power Plant Portion of the SCA.[185] On September 7, 2010, DEP issued a Fourth Incompleteness Review for FPL's SCA, and as part of DEP's request for additional information with this fourth request, the SFPC again expressed its opinion that FPL's SCA was incomplete without assessing a plus-one foot rise in sea level for the Turkey Point site.[186] FPL's response to this ongoing debate included the following:

> … FPL has considered other information, including the U.S. Army Corps of Engineers Circular regarding sea level rise. If it is demonstrated that significant sea level rise will affect South Florida and accessibility to Turkey Point 6 & 7, associated facilities, or operations in any way, FPL will have the opportunity to address these in an effective manner to allow the continued operations of plant facilities as planned by the Company. FPL will comply with all applicable regulatory requirements to maintain safe and continuous operation of the facility and associated features.[187]

According to FPL's plans, Units 6 and 7 are scheduled to become operational around 2020.[188]

V. Recommendations

Similar to Florida, and other vulnerable coastal states of the U.S., the United Kingdom (UK) must decide how to implement sea level rise policies that effectively protect existing nuclear reactors,[189] while simultaneously weighing whether to move forward with newly proposed coastal

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[184] *Id.*

[185] *See* DEP, *Florida Power & Light Turkey Point Nuclear Units 6 & 7*, http://www.dep.state.fl.us/siting/apps.htm#ppn1.

[186] *Id.*

[187] Response to SFWMD – FPL TURKEY POINT UNITS 6 & 7 SITE CERTIFICATION APPLICATION PLANT AND NON-TRANSMISSION FACILITIES 4TH ROUND COMPLETENESS, 0938-7652 (Feb. 2011).

[188] *Id.*

[189] International Nuclear Safety Center, *Maps of Nuclear Reactors: United Kingdom*, http://www.insc.anl.gov/pwrmaps/map/united_kingdom.php.

reactors.[190] In 2006, the MET Office, as the United Kingdom's National Weather Service, partnered with three leading U.K. energy companies to study and assess the potential impacts of climate change on the U.K. energy industry.[191] This study resulted in a follow-up project known as EP2 – an *industry-funded* partnership between eleven energy companies and the MET Office to further explore how the energy industry should adapt to climate change.[192] And specific to sea level rise, EP2 "[b]uilt a tool to enable UK coastal and marine sites of interest to be screened to assess if sea level rise should be considered in more detail."[193] This cooperative mentality will likely serve the U.K. well, and even more importantly, also seemingly embodies the IAEA's current approach to flood safety as it relates to sea level rise (i.e., to integrate and follow IPCC predictions in an abundance of caution). No such measures have been taken in the U.S., as the NRC has yet to address climate change, and continues to apply seemingly out-dated regulations based upon historical trends in sea level rise that simply fail to account for an accelerated rise. To their credit, state-level entities such as DEP, SFWMD, and SFRPC, and federal agencies such as the National Park Service have all raised legitimate sea level concerns regarding new reactor applications. Hopefully, the NRC will eventually update RG 1.59 in mid-to-late 2011, but even then, such measures will likely have no retroactive effect on PEF and FPL's previously submitted COL applications.

Unfortunately, future accelerated sea level rise planning is currently absent from the NRC's review process. And arguably, the only real sea level rise planning for Florida's two pending COL applications occurred prior to the NRC's involvement when PEF took a self-implemented "hard look" at sea level rise science and decided to build seven miles inland at a higher elevation than its coastal Crystal River site. As a result, even though sea level rise was potentially grossly underestimated in both the NRC and FPL's safety analysis, the majority of flood safety concerns were preempted by PEF's decision to move inland. Stated differently, because PEF exercised responsibility in choosing an *inland* reactor site at a higher elevation, and relinquished the opportunity to expand the existing coastal site at the Crystal River Energy Complex, sea level concerns have been significantly reduced regardless of whether the NRC is enforcing effective flood-safety policies.

In contrast, South Florida's flat geography and limited space left FPL with few, if any, choices to expand its nuclear operation to undeveloped, higher geographic elevations. But limited siting opportunities do not justify a decision to build at an overly risky location simply because more protected sites were not available. The realities of the latest sea level rise predictions as reported by the USGCRP and the IAEA only further reinforce that the South Florida coastline is not a good place to build new reactors.

As for the existing reactors at Crystal River, St. Lucie, and Turkey Point, the NRC has assured Rep. Markey that if sea level rise infringes a technical specification of a reactor's operating license,

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[190] *See* GREENPEACE, THE IMPACTS OF CLIMATE CHANGE ON NUCLEAR POWER STATIONS SITES: A REVIEW OF FOUR PROPOSED NEW-BUILD SITES ON THE UK COASTLINE (March 2007) (recommending against building new coastal reactors in the UK), *available at* http://www.greenpeace.org.uk/files/pdfs/nuclear/8176.pdf.

[191] Met Office, *Impacts on energy*, http://www.metoffice.gov.uk/climatechange/businesses/casestudies/energy.html.

[192] *Id.*

[193] *Id.*

the NRC will force the energy company to take action, which includes "reducing power or shutting down the plant entirely."[194] So although it seems reassuring that the NRC will take such precautions if necessary, what happens when such measures are necessary only 20 to 30 years into the life of a new coastal reactor? If the USGCRP believes a 3-4 foot rise in sea level is "reasonably foreseeable" in this century, it would also seem "reasonably foreseeable" that FPL's new reactors may never operate long enough to recoup the billions of dollars spent on building these units in the first place.

As of 2011, an emerging U.S. energy policy seems set on becoming more environmentally friendly in the face of climate change, yet is just now beginning to examine how climate change may impact the power plants themselves. If only because of the unfortunate events in Japan, the time has come for decision-makers to either (1) begin to take voluntary measures to minimize the potential for accelerated sea level rise impacts including decisions for siting future plants, or (2) openly disregard accelerated sea level rise projections by taking a public stance that accelerated projections are simply wrong. And if Russia's newly constructed *floating* reactors are a cause for concern, at least they are designed to rise with the sea.[195]

VI. Conclusion

NRC's out-dated flood safety policies largely ignore the high-stakes consequences of nuclear power vulnerability in the form of inundation and/or island-like conditions from accelerated sea level rise. And as nuclear power reemerges with renewed life as a potential means of combating climate change, the very same proposed coastal reactors in which to accomplish that goal appear to largely ignore or underestimate climate-induced sea level rise concerns. Because Florida is one of the most geographically vulnerable sites to the potential impacts of sea level rise, and simultaneously both the home of current and future coastal reactors, the future looks *expensive* if current climate change science proves accurate.

In the meantime, the planned construction of multi-billion dollar coastal nuclear reactors continues, and as these plans move forward, it is inevitable that the decisions of today will have long-term consequences. When considering the uncertain extent to which the utility companies and regulators are actually considering the threat of accelerated sea level rise to Florida's existing and future coastal reactors, the fate of such infrastructure in coming decades, in many respects, is purely a game of wait and "sea."

And after all, even multi-billion dollar U. S. Nuclear Reactors become islands in the sea, eventually.

-James F. Choate III

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[194] U.S. NRC Letter, *supra* note 56, at 2.

[195] *Russia Offers to Build Floating Nuclear Plant for Indonesia, for Power and Water*, LAROUCHE POLITICAL ACTION COMMITTEE, Oct. 20, 2010 ("The first floating nuclear plant, the 'Akademik Lomonosov,' which is nearing completion, is scheduled to be deployed in the Kamchatka region of Russia's far east in 2012. The barge that will be the platform for the pair of 25MW reactors was completed and launched earlier this year."), http://www.larouchepac.com/node/16149. *See also* Rod Adams, *Offshore Power Systems: Big Plants for a Big Customer*, ATOMIC, Vol. 2, Issue 5 (Aug. 1996) (profiling the U.S. attempt to build offshore floating reactors), *available at* http://www.atomicinsights.com/aug96/Offshore.html.

Comprehensive Seagrass Restoration Planning in Southwest Florida: Science, Law and Management

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Abstract: In coastal Florida, the development and maintenance of docks, marinas, and channels frequently cause destruction of seagrass beds. Seagrass loss is accompanied by a loss of the ecosystem services the beds provide, such as sediment stabilization, water filtration, protection from storms, and habitat and nursery grounds for fish species. The current legal framework for seagrass protection and the implementation of mitigation for seagrass loss could be improved. In this Article, the authors argue that policymakers could revise the Uniform Mitigation Assessment Method to include more assessments related specifically to the ecology of seagrass beds and their ecosystem services. Seagrass mitigation is currently carried out by the permittee that applied to create or maintain the seagrass-impacting development. In comparison, wetland mitigation is typically carried out by publicly or privately operated mitigation banks. The creation of mitigation banks for seagrass restoration would streamline the process of seagrass mitigation and promote the public's interest in seagrass restoration.

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I. Introduction

Population growth is occurring worldwide, and a substantial percentage of the growth is in coastal areas. Southwest Florida is no exception. Along with increasing population comes development to serve the growing community. Development inevitably results in the loss of natural habitats. In coastal areas, the development and maintenance of docks, marinas, and channels frequently causes the destruction of seagrass beds. Seagrass loss means a loss of the ecosystem services seagrasses provide coastal communities, including services such as sediment stabilization, water filtration, protection from storms, and habitat and nursery grounds for fish species.

Seagrasses inhabit the sovereign submerged lands Florida holds in trust for the state's citizens. Through the public trust doctrine, the state protects the public's interest in both using these areas for boating, fishing, and swimming and in protecting the natural resources that make boating, fishing, and swimming enjoyable. Conflict arises from the fact that while development and navigation are often in the public interest, so is the protection of natural resources. To resolve this conflict, current policy allows for development on sovereign submerged lands but requires mitigation to compensate the public for any ecosystem services that are lost.

This Article makes the case that the current method of determining and implementing mitigation for seagrass loss could be improved. Policymakers could revise the Uniform Mitigation Assessment Method to include more assessments related specifically to the ecology of seagrass beds and their ecosystem services. Seagrass mitigation is currently carried out by the permittee that applied to create or maintain the seagrass-impacting development. In comparison, wetland mitigation is typically carried out by mitigation banks. The creation of mitigation banks for seagrass restoration would streamline the process of seagrass mitigation and promote the public's interest in seagrass restoration.

Part II of this Article describes the ecology of seagrass, while Part III describes the historic and current extent of seagrass coverage in southwest Florida. Part IV covers the array of factors that lead to the damage and loss of seagrass in coastal areas. Part V provides an overview of the federal and state laws and regulations that apply to seagrass protection and restoration efforts. Part VI describes alternative methods of seagrass mitigation that coastal authorities in southwest Florida are implementing. Part VII concludes with a plan for improving seagrass restoration.

II. The Ecology of Seagrass

Seagrasses are aquatic angiosperms that inhabit marine environments.[4] They grow in underwater meadows in sheltered coastal waters and are typically characterized by long, narrow green leaves, which make them superficially look like terrestrial grasses, hence the name seagrass. While seagrasses complete their entire lifecycle underwater, they must grow in water shallow enough for photosynthesis to take place.[5] This typically limits them to average water depths of two meters or less. There are about sixty species of seagrasses in the world.[6] The primary species present

[4] C. Den Hartog & John Kuo, *Taxonomy and Biogeography of Seagrasses*, *in* SEAGRASSES: BIOLOGY, ECOLOGY AND CONSERVATION 1 (A. W. D. Larkeum et al. eds., 2006). Angiosperms are flowering plants.
[5] *Id.* at 2.
[6] Robert J. Orth et al., *A Global Crisis for Seagrass Ecosystems*, 56 BIOSCI. 987, 987 (2006).

in southwest Florida are turtle-grass (*Thalassia testudinum*), shoal-grass (*Halodule wrightii*), and manatee-grass (*Syringodium filiforme*).

Seagrasses have a number of ecological roles. They are a food source for grazers such as endangered West Indian manatees (*Trichechus manatus*) and green sea turtles (*Chelonian mydas*). Organisms like sponges, bivalves, and barnacles live permanently in seagrass and help filter and clean water by actively trapping organic matter from the water column.[7] Further, the structure of seagrass leaves and the canopy created when all the leaves combine can modify the velocity of waves and water current, helping to remove sediment and to improve water quality in estuarine systems.[8] This enhances sedimentation of suspended particles and prevents sediment re-suspension, thus slowing erosion.[9] Sediment stabilization is also facilitated by the dense network of rhizomes and roots associated with seagrasses.[10] These rhizomes and roots also protect coastlines from storms by dissipating wave energy.[11]

Seagrass beds are important habitat for commercially and recreationally significant species.[12] Many of the small fish found in seagrass are non-commercial species; however, they are an important food source for commercial species. Although very few species depend on seagrass year-round or throughout their entire lives, many species depend on seagrass during a critical time of the year or during a particular stage in their lifecycle.[13] The structural complexity of seagrass beds provides protection from predators for small or juvenile fish. Seagrasses further provide an increase in available food, improving survival and growth for juvenile organisms.

Seagrasses are linked to other marine and even terrestrial ecosystems by the movement and foraging of predators and herbivores and by the passive movement of seagrass biomass and algae caused by water flow.[14] This allows seagrasses to play an integral role in coastal nutrient cycling. Seagrasses export nutrients through leaf loss/decay and through consumption by foragers; seagrasses import nutrients through nitrogen fixation and nutrient uptake.[15] There is plenty of biomass to move around, as seagrasses have extremely high productivity. Research shows seagrasses annually produce an average of 1,012 grams of dry weight per square meter.[16] When compared to the annual production of other communities that occur in similar ecosystems, such as macroalgae's annual production of 365 grams of dry weight per square meter and phytoplankton's annual

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[7] Nuria Marba et al., *Seagrass Beds and Coastal Biogeochemistry, in* SEAGRASSES: BIOLOGY, ECOLOGY AND CONSERVATION 136 (A. W. D. Larkeum et al. eds., 2006).

[8] Mark S. Fonseca, Brian E. Julius & W. Judson Kenworthy, *Integrating Biology and Economics in Seagrass Restoration: How Much is Enough and Why?*, 15 ECOLOGICAL ENG'G 227, 232 (2000).

[9] Marba, *supra* note 7.

[10] EDMUND P. GREEN & FREDERICK T. SHORT, WORLD ATLAS OF SEAGRASSES 1 (2003).

[11] *Id.*

[12] Michael W. Beck et al., *The Identification, Conservation, and Management of Estuarine and Marine Nurseries for Fish and Invertebrates*, 51 BIOSCI. 633, 633 (2001).

[13] Bronwyn M. Gillanders, *Seagrasses, Fish, and Fisheries*, *in* SEAGRASSES: BIOLOGY, ECOLOGY AND CONSERVATION 503 (A. W. D. Larkeum et al. eds., 2006).

[14] Kenneth L. Heck Jr. et al., *Trophic Transfers from Seagrass Meadows Subsidize Diverse Marine and Terrestrial Consumers*, 11 ECOSYSTEMS 1198, 1198 (2008).

[15] M. A. Hemminga, P. G. Harrison, & F. van Lent, *The Balance of Nutrient Losses and Gains in Seagrass Meadows*, 71 MAR. ECOL. PROG. SER. 85, 85 (1991).

[16] Carlos M. Duarte & Carina L. Chiscano, *Seagrass Biomass and Production: A Reassessment*, 65 AQUATIC BOTANY 159, 159 (1999).

production of 128 grams of dry weight per square meter, seagrass is three to eight times as productive.[17] The high primary productivity of seagrasses means that they play a large role in oceanic carbon fixing, contributing approximately 15% to the ocean's global carbon sequestration.[18]

Seagrasses provide so many ecosystem services that it is difficult to put a price tag on their worth. A 1997 study found that for nutrient cycling alone seagrass was valued at $19,004 a hectare per year.[19] A study in 2006 estimated the value of seagrass in Florida's Indian River Lagoon to be $30,888 a hectare per year.[20] In the years since these studies, the value of each hectare of seagrass has only gone up. Depending on the severity of the degradation and the location and accessibility of the site, the cost for restoring seagrass ranges from $250,000 to $2,500,000 per hectare.[21]

A. *Historic Seagrass Coverage and Trends*

It is difficult to determine how much seagrass the world contains. There are 16,400,000 hectares of documented beds, but many beds remain undocumented.[22] If one factors in the areas where seagrass may exist, there could be as many as fifty million hectares of seagrass; however, this is likely an overestimation.[23] In the last two decades, the documented loss of seagrass has been approximately 3,300,000 hectares, or 20% of the total documented seagrass coverage in the world.[24]

Southwestern Florida's Charlotte Harbor National Estuary Program (CHNEP) estimates that in the 1950's there were 24,893 hectares of seagrass from Venice Beach in the north to Estero Bay and Bonita Beach in the south.[25] CHNEP drew these calculations from aerials taken in the 1950's that are impossible to ground truth and are limited in terms of clarity. The 2009 CHNEP study set the target number of hectares needing restoration in southwest Florida at 1,600.[26] The study did

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[17] *Id.* at 171.
[18] *Id.* at 172.
[19] Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253, 256 (1997). A hectare is ten thousand square meters. It converts to 2.47 acres.
[20] W. Judson Kenworthy et al., *Seagrass Conservation Biology: An Interdisciplinary Science for Protection of the Seagrass Biome*, *in* SEAGRASSES: BIOLOGY, ECOLOGY AND CONSERVATION 599 (A. W. D. Larkeum et al. eds., 2006).
[21] *Id.*
[22] Green & Short, *supra* note 10, at 14.
[23] *Id.*
[24] Diana I. Walker, Gary A. Kendrick & Arthur J. McComb, *Decline and Recovery of Seagrass Ecosystems - The Dynamics of Change, in* SEAGRASSES: BIOLOGY, ECOLOGY AND CONSERVATION 552 (A. W. D. Larkeum et al. eds., 2006).
[25] Anthony Janicki, Michael Dema & Mike Wessel, WATER QUALITY TARGET REFINEMENT PROJECT TASK 2: SEAGRASS TARGET DEVELOPMENT 10 (2009).
[26] *Id.* at 30.

not try to quantify the quality of current seagrass beds.[27] Some historically thick and lush beds, though currently present, may be sparse and scarred. Future studies would benefit from assessing the quality of seagrass beds in the area instead of looking only at quantity.

B. Causes of Seagrass Loss Over Time

There are a number of reasons why seagrass beds are declining worldwide. Some of the direct anthropogenic causes of seagrass loss are propeller scarring (prop scarring) and dredging. Prop scarring occurs when a boat does not have sufficient draft, which is the distance between the bottom of the boat and the seagrass bed. This results in the propeller tearing and cutting up seagrass roots, stems, and leaves, producing a long narrow furrow devoid of seagrass. Of Florida's approximate 1,100,000 hectares of seagrass, more than 70,011 hectares are scarred.[28] As the population of Florida's coastal residents and seasonal visitors continues to increase, so do the number, size, and power of vessels used in shallow, coastal environments. These increases result in extensive scarring of seagrass beds.[29] Blow outs, or large circular areas from which seagrass has been removed, frequently occur when a boat runs aground.

In the past fifty years, dredging from twenty documented projects has caused a loss of 21,023 hectares of seagrass beds.[30] There are many more dredging projects where seagrass damage was not quantified or reported at all. Dredging harms seagrass by physically removing it from the channel and by increasing turbidity in the area. Frequently, however, dredging is necessary to create and maintain navigation channels.[31] In some cases, creating a channel through a shallow area may cause a small loss of seagrass within the channel but may provide protection for the surrounding beds by giving boats a safe way to navigate through an area, thereby decreasing potential for scarring. Further, new environmental dredging techniques minimize adverse impacts on seagrass.[32] For example, turbidity plumes are reduced when hydraulic dredging increases the ratio of water to sediment that is removed from the dredging canal.[33]

Anthropogenic impacts also occur indirectly. Some of these impacts, like eutrophication, can be more difficult to trace and to recognize but are frequently more harmful than direct impacts.[34] Developing an area often leads to changes in water quality and quantity. High nutrient loads, particularly nitrogen and phosphorus from waste and agricultural runoff, enter estuaries and lead

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[27] The CHNEP study found that currently there are 25,132 hectares of seagrass beds in the study area, 239 more hectares than were present during the 1950's. Though about half the areas in the study appeared to have more seagrass coverage, about half appeared to have less. The 1,600 hectares targeted for restoration are in the areas with decreased seagrass coverage. Though boating patterns suggest that existing beds are likely patchier and more scarred than they were in the 1950's, the study did not address these factors.

[28] F.J. Sargent et al., *Scarring of Florida's Seagrasses: Assessment and Management Options*, *in* FLORIDA MARINE RESEARCH INSTITUTE TECHNICAL REPORTS TR-1 1 (Theresa M. Bert et al eds., 1995).

[29] *Id.* at 3.

[30] Paul L.A. Erftemeijer & Roy R. Robin Lewis III, *Environmental Impacts of Dredging on Sea Grasses: A Review*, 52 MARINE POLLUTION BULLETIN 1553, 1559 (2006).

[31] *Id.* at 1553.

[32] *Id.* at 1564.

[33] *Id.*

[34] Eutrophication is the addition of excessive nutrients into a waterbody, thus causing excessive algal blooms.

to higher levels of epiphytes and algae.[35] Epiphytes and algae are problematic to seagrass beds because they limit the amount of sunlight that reaches seagrass blades. High epiphyte levels have been linked to low shoot densities and low seagrass biomass.[36] When the volume of algae in the water column is high, less light reaches seagrasses growing on the bottom, leading to a decline in seagrass numbers.[37]

Development further affects seagrasses by changing the amounts of sediment, freshwater, and saltwater that enters an estuary. Sedimentation is often associated with land use changes inland of the seagrass beds. When sediment washes into an estuarine system it increases turbidity, limiting the amount of light that reaches seagrass in much the same way as excessive algae in the water column does.[38] Severe sedimentation, which commonly occurs after storm events, can physically cover seagrass beds. Developments impact freshwater quantity by altering the timing and amount of freshwater that flows into bays and estuaries. Similarly, construction of bridges and canals can affect seagrass by altering the amount of saltwater entering an estuary.[39]

Humans further impact seagrass by removing large predatory fish for consumption, which alters the food webs of seagrass beds and leads to an abundance of small predators like pinfish. The small predators feed on epiphytic algae-grazers such as gastropods, causing their populations to crash. Low numbers of algae-grazing gastropods cause epiphytic algae to proliferate, preventing seagrass from photosynthesizing and leading to a loss in seagrass numbers.[40]

Another indirect anthropogenic impact on seagrass is climate change and the associated rise in sea level. There is high uncertainty surrounding how different types of ecosystems will react and adapt to climate change. Climate trends are complex and are governed by a multitude of processes. Some locales are likely to get warmer while others may actually become cooler as changes in ocean currents and winds bring warm water and air over landmasses. Average yearly global sea level rise is currently about 1.3 millimeters, plus or minus 0.7 millimeters, but is projected to increase up to 3.8 millimeters, plus or minus 1.3 millimeters, per year by 2080.[41] This is an average of 0.26 to 0.59 meters of sea level rise by 2100. Sea level rise in the Gulf of Mexico is expected to be 0.05 meters greater than the global average. Many researchers argue that sea level rise will likely exceed 1 meter by 2100.[42]

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[35] Brian E. Lapointe, David A. Tomasko & William R. Matzie, *Eutrophication and Trophic State Classification of Seagrass Communities in the Florida Keys*, 54(3) BULLETIN OF MARINE SCIENCE 696, 696 (1994). Epiphytes are plants that grow on seagrass blades.

[36] David A. Tomasko & Brian E. Lapointe, *Productivity and Biomass of* Thalassia Testudinum *as Related to Water Column Nutrient Availability and Epiphyte Levels: Field Observations and Experimental Studies*, 75 MAR. ECOL. PROG. SER. 9, 9 (1991).

[37] Lapointe, Tomasko & Matzie, *supra* note 35, at 696.

[38] Peter J. Ralph et al., *Human Impacts on Seagrasses: Eutrophication, Sedimentation, and Contamination*, *in* SEAGRASSES: BIOLOGY, ECOLOGY AND CONSERVATION 575 (A. W. D. Larkeum et al. eds., 2006).

[39] *Id.* at 573.

[40] K. L. Heck Jr. & J. F. Valentine, *The Primacy of Top-down Effects in Shallow Benthic Ecosystems*, 30(3) ESTUARIES AND COASTS 371, 376 (2007).

[41] Gerald A. Meehl et al., *Global Climate Projections*, *in* CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP 1 TO THE FORTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 812 (Solomon, S., et al. eds., 2007).

[42] Jeremy L. Weiss, Jonathan T. Overpeck & Ben Strauss, *Implications of Recent Sea Level Rise Science for Low-Elevation Areas in Coastal Cities of the Conterminous U.S.A.*, 105 CLIMATIC CHANGE 635, 635 (2011).

Whether the sea level rises 0.5 meter or 1 meter in the next 90 years, the distribution of seagrass will shift as temperatures and water depths change.[43] Seagrass in Florida appears to be mostly light-limited, and as water depths increase, deficiencies in light available for photosynthesis will lead to losses of seagrasses from the deep edge of the beds. Water clarity is also likely to decrease as scientists predict the frequency and intensity of extreme weather events to increase.

The effects of climate change on seagrass populations are not one-dimensional, however, as some elements of climate change may actually increase seagrass populations. One of the main drivers of global climate change is an increase in atmospheric CO_2. An increase in atmospheric CO_2 will also increase CO_2 concentrations in seawater, which one study found to cause higher reproductive output, below-ground biomass, and new shoots in non light-limited seagrass beds.[44] However, in light-limited seagrass beds, CO_2 enrichment did not improve seagrass growth.[45]

The anthropogenic impacts to seagrass have been severe; however, there are ongoing efforts to protect and restore them. The remainder of this Article will look at how federal, state, and local laws and regulations protect seagrass and encourage restoration. The Article will also evaluate changes that could further support seagrass protection and restoration while minimizing negative impacts to the livelihoods of southwest Floridians.

III. The Legal Framework for Seagrass Protection

A. *Federal Law*

Those engaged in seagrass restoration must be cognizant of the various federal environmental laws governing natural resources. Seagrass restoration is likely to implicate at least three federal statutes: the Rivers and Harbors Appropriations Act of 1899 (RHA),[46] the Clean Water Act (CWA),[47] and the Endangered Species Act (ESA).[48] All three statutes will add wrinkles to the restoration process; however, with informed decision-making, parties engaged in restoration should be able to complete their projects without running afoul of federal law.

1. The River and Harbors Appropriations Act of 1899

Congress enacted the RHA in an effort to maintain and regulate the navigability of the nation's waters.[49] Among other things, the Act regulates the construction of bridges, dams, piers, bulkheads, and other obstructions to navigability in or over the nation's navigable waters.[50] The

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[43] Frederick T. Short & Hilary A. Neckles, *The Effects of Global Climate Change on Sea Grasses*, 63 AQUATIC BOTANY 169, 169 (1999).

[44] Sherry L. Palacios & Richard Zimmerman, *Response of Eelgrass* Zostera Marina *to* CO_2 *Enrichment: Possible Impacts of Climate Change and Potential for Remediation of Coastal Habitats*, 344 MAR. ECOL. PROG. SER. 1, 1 (2007).

[45] *Id.*

[46] 33 U.S.C. §§ 401-67.

[47] *Id.* §§ 1251-1387.

[48] 16 U.S.C. §§ 1531-44.

[49] *See generally* 33 U.S.C. §§ 401-67.

[50] *Id.* §§ 401, 403.

Act also makes it illegal to "throw, discharge, or deposit" refuse into navigable waters.[51] Of pertinence to seagrass restoration projects, the RHA regulates activities excavating or placing fill in navigable waters.[52] Although 1972's CWA also regulates much of the RHA's subject matter,[53] the RHA remains both good law and a necessary component of seagrass restoration plans.

The provisions regulating the placement of fill in navigable waters are found in RHA § 10, which reads,

> [I]t shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of War prior to beginning the same.[54]

This section is applicable to seagrass restoration projects because both seagrass and the soil that is deposited along with seagrass are considered fill.[55]

The U.S. Army Corps of Engineers (Corps) implements this legislation. The Corps expounds upon its regulation of fill in navigable waters in Part 323 of the Code of Federal Regulations (Code).[56] Within this Part, the Corps defines fill as, "material placed in waters of the United States where the material has the effect of: (i) [r]eplacing any portion of a water of the United States with dry land; or (ii) [c]hanging the bottom elevation of any portion of a water of the United States."[57] The provisions continue by providing examples of fill, including things such as "rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mining or other excavation activities, and materials used to create any structure or infrastructure in the waters of the United States."[58] The Corps further elaborates on its navigable waters regulatory authority in Parts 320 through 332 of the Code.[59]

2. The Clean Water Act

Congress preserved the Corps' authority in regulating fill in navigable waters with the enactment of the Federal Water Pollution Control Act Amendments of 1972.[60] Known popularly as the CWA, this legislation memorialized the 92nd Congress' aspirations to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[61] Seagrass restoration

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[51] *Id.* § 407.
[52] *Id.* § 403.
[53] *Id.* §§ 1251-1387.
[54] *Id.* § 403. Though codified as § 403, this section is popularly referenced by its public law designation, § 10.
[55] 33 C.F.R. § 323.2(e).
[56] *Id.*
[57] *Id.* § 323.2(e)(1)(i)-(ii).
[58] *Id.* § 323.2(e)(2).
[59] *Id.* §§ 320-332.
[60] 33 U.S.C §§ 1251-1387. See specifically § 1344, regulating dredge and fill activities in navigable waters and maintaining permitting authority with the Corps.
[61] *Id.* § 1251.

projects implicate the CWA because § 404 regulates dredge and fill activities in navigable waters.[62] Section 404 reads, "[t]he Secretary may issue permits, after notice and opportunity for public hearings for the discharge of dredged or fill material into the navigable waters at specified disposal sites."[63] Based on the same definition of fill discussed in reference to the RHA,[64] the Corps' § 404 permitting authority extends to seagrass restoration projects conducted in the nation's navigable waters.

Though falling within § 404 jurisdiction, certain seagrass restoration projects may be exempt from the individual permitting process if the project falls within one of the Corps' nationwide permits. Nationwide permits are Corps-issued permits authorizing a category of activities that only minimally impact navigable waters.[65] To be eligible for a nationwide permit, the activity impacting navigable waters must be conducted in accordance with the conditions dictated in the permit.[66]

Permits 18 and 13 could potentially apply to seagrass restoration projects. Nationwide Permit 18 authorizes "[m]inor discharges of dredged or fill material."[67] This is limited to discharges of less than twenty-five cubic yards of fill within no more than 1/10 of an acre of water.[68] Though potentially applicable, these limitations would preclude all but very small restoration projects from utilizing this permit.

Permit 13 authorizes bank stabilization to combat shoreline erosion.[69] This permit would be limited to seagrass restoration projects conducted as part of a Living Shoreline project.[70] To utilize the permit, however, the project must meet a number of limiting criteria.[71] For example, the project must impact less than 500 feet of shoreline, must involve less than a cubic yard of fill per linear foot, and must not be in a "special aquatic area,"[72] which the Code defines as "geographic areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values."[73]

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[62] *Id.* § 1344.
[63] *Id.* § 1344(a).
[64] 33 C.F.R. § 323.2(e).
[65] For information on the Corps' Nationwide Regulatory Program, see http://www.usace.army.mil/cecw/pages/nw_permits.aspx.
[66] *Id.*
[67] U.S. ARMY CORPS OF ENG'RS, DECISION DOCUMENT NATIONWIDE PERMIT 18 at 1 (2011), *available at* http://www.usace.army.mil/CECW/Documents/cecwo/reg/nwp/NWP_18_2007.pdf.
[68] *Id.* The Permit states that the discharge cannot "cause loss of more than 1/10 acre of waters of the United States." "Loss of waters of the United States" occurs when waters are "permanently adversely affected," such as by "increase[ing] the bottom elevation of a waterbody." U.S. ARMY CORPS OF ENG'RS, 2007 NATIONWIDE PERMITS, CONDITIONS, FURTHER INFORMATION, AND DEFINITIONS (WITH CORRECTIONS) 35, *available at* http://www.usace.army.mil/CECW/Documents/cecwo/reg/nwp/nwp2007_gen_conditions_def. pdf.
[69] U.S. ARMY CORPS OF ENG'RS, DECISION DOCUMENT NATIONWIDE PERMIT 13 at 1 (2011), *available at* http://www.usace.army.mil/CECW/Documents/cecwo/reg/nwp/NWP_13_2007.pdf.
[70] A Living Shoreline is a project where an eroded shoreline is protected or restored by introducing organic materials such as plants or oyster shells rather than hardened armoring.
[71] Nationwide Permit 13 Decision Document, *supra* note 69.
[72] *Id.*
[73] 40 C.F.R. § 230.3(q-1).

Neither Permit 18 nor Permit 13 will apply to the majority of seagrass restoration projects. Therefore, most projects will require project-specific consultation with the Corps and procurement of an individual § 404 permit. However, even if consultation and permitting satisfies the dictates of the RHA and the CWA, parties engaged in seagrass restoration must be aware of the requirements of the ESA and the potential consequences of violating this statute.

3. The Endangered Species Act

In the year following the CWA's enactment, the 93rd Congress enacted the ESA to protect endangered and threatened species from extinction.[74] The legislation aimed "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such ... species, and to take such steps as may be appropriate to achieve the purposes of the [nation's] treaties and conventions."[75] The Fish and Wildlife Service (FWS) implements the ESA for terrestrial, avian, and freshwater species; the National Oceanic and Atmospheric Administration (NOAA) implements the ESA for marine species.[76] The ESA implicates seagrass restoration activities because seagrass serves as habitat for endangered and threatened species and because Florida is home to an endangered seagrass species.

One of the key provisions of the ESA is found in § 7 of the Act. Section 7 requires all federal agencies to consult the FWS before taking action that may impact an endangered or threatened species.[77] The federal agency must assure that its activities, including those it does not conduct but rather funds or authorizes, are "not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat."[78] The ESA discusses critical habitat in § 4, dictating that the governing agency will use "the best scientific data available" and will consider economic impacts, national security, and other relevant factors when designating critical habitat.[79] However, the governing agency must list an area as critical habitat if "failure to designate such area as critical habitat will result in the extinction of the species concerned."[80]

In addition to § 7, the second crucial element of the ESA is § 9, which prohibits any "take" of an endangered or threatened animal.[81] Section 9 does not apply to threatened or endangered plants. A "take" is any action that will "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" a protected species.[82] Section 9 is not limited to direct harm of protected animals, but extends to actions that adversely implicate a protected animal's critical habitat.[83]

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[74] 16 U.S.C. § 1531 et. seq.
[75] *Id.* § 1531(b).
[76] *See* JAMES SALZMAN & BARTON H. THOMPSON, JR., ENVIRONMENTAL LAW AND POLICY 258 (2003). The National Marine Fisheries Service is the division within NOAA that is charged with implementing NOAA's ESA responsibilities.
[77] 16 U.S.C. § 1536(a)(2).
[78] *Id.* Subsection (h) of § 7 provides criteria to be considered in granting an exemption to § 7's ban on adverse impacts to endangered and threatened species and habitat. *See id.* § 1536(h).
[79] *Id.* § 1533(b)(2).
[80] *Id.*
[81] *Id.* § 1538.
[82] *Id.* § 1532(19). It also includes an "attempt to engage in any such conduct." *Id.*
[83] *See* Salzman & Thompson, Jr., *supra* note 76, at 265-66.

Pursuant to federal rule, "[h]arm in the definition of 'take' … means an act which actually kills or injures wildlife. Such 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."[84] This rule, promulgated by the FWS in 1981, has been a source of considerable controversy.[85] By regulating habitat modification, the rule implicates any number of activities solely because an activity is conducted in an area critical to a protected species.

In September of 1998, NOAA listed Johnson's Seagrass (*Halophila johnsonii*) as a threatened species.[86] Found in the intertidal zone and coastal lagoons of southeast Florida from Biscayne Bay to Sebastian Inlet, Johnson's Seagrass exhibits flowers, spatulate leaves in pairs, and longnecked fruits.[87] The species is distinguished from most other seagrasses by its asexual reproduction and by its distinct leaves.[88]

Johnson's Seagrass' asexual reproduction limits its ability to expand its distribution; however, its endangerment is further exacerbated by the anthropomorphic interferences discussed in Part IV of this Article.[89] A prime obstacle to Johnson's Seagrass' well-being is prop scarring.[90] Scarring destroys root systems, cuts through the plant's subterranean plant stems, and diminishes the stability of the substrate.[91] Dredging poses similar obstacles.[92] In addition to these direct perturbations, sedimentation and degraded water quality caused by human activities pose further problems for Johnson's Seagrass.[93]

Federal efforts to protect the species began in 1993 when NOAA issued a Notice of Proposed Rulemaking to list Johnson's Seagrass as a threatened species. Two years after NOAA's 1998 final listing, the agency designated Johnson's Seagrass' critical habitat in southeast Florida. In 2002, the agency published the Johnson Seagrass' recovery plan.[94]

So long as it is listed as a protected species, Johnson's Seagrass will remain a necessary consideration when planning and implementing a seagrass restoration project in southeast Florida. Though exempt from the "take" prohibition of § 9, other provisions within the section may still apply to restoration projects. Those commencing projects on federal land may not "remove and reduce to possession" nor "maliciously damage or destroy" any protected plants such as Johnson's Seagrass.[95] Section 9 also dictates that one may not "deliver, receive, carry, transport, … ship[,] … sell[,] or offer for sale" any threatened or endangered plant.[96] Further, ESA § 7 will put burdens on

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[84] 50 C.F.R. § 17.3(c)(3).
[85] *See* Salzman & Thompson, Jr., *supra* note 76, at 266.
[86] U.S. Fish and Wildlife Service, Species Profile, Johnson's Seagrass (*Halophila johnsonii*), http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q3AL.
[87] NOAA Fisheries, Office of Protected Resources, Johnson's Seagrass (*Halophila johnsonii*), http://www.nmfs.noaa.gov/pr/species/plants/johnsonsseagrass.htm.
[88] *Id.*
[89] *Id.*
[90] *Id.*
[91] *Id.*
[92] *Id.*
[93] *Id.*
[94] *Id.*
[95] 16 U.S.C. § 1538(a)(2)(B).
[96] *Id.* § 1538(a)(2)(C)-(D).

any project involving federal licensure or funding.[97] Because many projects will require a CWA § 404 permit, those interested in seagrass restoration in Johnson's Seagrass habitat will be compelled to consider the ESA and to avoid adverse impacts to the threatened species.

In addition to inquiring whether the seagrass bed involved in restoration is a protected species, those engaged in restoration must also consider whether the seagrass bed is critical habitat to an endangered or threatened species. Seagrass beds in Florida provide habitat and food for many animals, including the endangered West Indian manatee (*Trichechus manatus*), first listed as endangered under an ESA precursor in 1967.[98] The West Indian manatee, a large marine mammal indigenous to Florida and the Caribbean, travels between salt and fresh water environments.[99] Manatees are herbivores; they consume both marine and freshwater plants, including many species of seagrass.[100] Those engaged in seagrass restoration should be aware of whether their activities are within manatee's critical habitat and of any restrictions or limitations the designation will impose on the proposed restoration project.

B. State Law

In addition to satisfying the dictates of the RHA, the CWA, and the ESA, those interested in pursuing seagrass restoration must also obtain the requisite state permits and authorizations. There are at least two components to securing Florida's approval for a seagrass restoration project: proprietary authorization to use Florida's sovereign submerged lands[101] and an Environmental Resource Permit to engage in activities in surface waters or wetlands.[102]

1. Proprietary Authorization

Sovereign submerged lands are those lands below the mean high water line on tidally influenced navigable waters[103] and those lands below the ordinary high water line on non-tidally influenced navigable waters.[104] Sovereign submerged lands do not include those lands that were formerly sovereign but that have been alienated by the state.[105] Though alienation of sovereign lands was fairly routine for many decades, it is no longer a common practice. Sovereign submerged

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[97] *Id.* § 1536(a)(2).

[98] *See* U.S. Fish and Wildlife Service, Species Profile, West Indian Manatee (*Trichechus manatus*), http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A007.

[99] Fact Sheet, U.S. Fish and Wildlife Service, West Indian Manatee (*Trichechus manatus)* (2008), *available at* http://www.fws.gov/endangered/esa-library/pdf/manatee.pdf.

[100] *See* FWS, *supra* note 98.

[101] FLA. STAT. § 253.77(1).

[102] *Id.* § 373.414.

[103] *See* FLA. CONST. art. X § 11 ("Sovereignty lands.—The title to lands under navigable waters, within the boundaries of the state, which have not been alienated, including beaches below mean high water lines, is held by the state, by virtue of its sovereignty, in trust for all the people. Sale of such lands may be authorized by law, but only when in the public interest. Private use of portions of such lands may be authorized by law, but only when not contrary to the public interest.").

[104] Florida Supreme Court precedent establishes the importance of the ordinary high water mark and how it is to be established. *See generally* Tilden v. Smith, 13 So. 708 (Fla. 1927).

[105] *Id.*

lands are held in trust for the people of Florida by the Board of Trustees of the Internal Improvement Trust Fund.[106] Pursuant to Florida Statutes § 253.77(1), "A person may not commence any excavation, construction, or other activity involving the use of sovereign or other lands of the state ... until the person has received the required lease, license, easement, or other form of consent authorizing the proposed use."[107]

The rules governing such authorization are codified in Chapters 18-20 and 18-21 of the Florida Administrative Code. Chapter 18-21 outlines the general guidelines; Chapter 18-20 outlines the more stringent guidelines for the submerged lands found in one of Florida's Aquatic Preserves. Both sets of guidelines dictate that authorization will be given on a case-by-case basis. Chapter 18-21 states, "[a]ctivities on sovereignty lands shall be designed to minimize or eliminate adverse impacts on fish and wildlife habitat, and other natural or cultural resources. Special attention and consideration shall be given to endangered and threatened species habitat."[108] Seagrass restoration projects fit within these parameters and should be viewed favorably by permitting staff. The rules on Aquatic Preserves specifically touch on restoration, listing "[r]estoration/enhancement of altered habitat or natural functions, such as ... re-establishment of shoreline or submerged vegetation" as an example of a specific benefit to be considered when analyzing whether a project is in the public interest.[109] Though the process may be time-consuming, properly planned seagrass restoration projects should merit approval and be given proprietary authorization to proceed on sovereign lands.

2. Environmental Resource Permitting

In addition to proprietary authorization, those interested in seagrass restoration must also obtain the requisite permits to engage in activities that impact the state's wetlands or surface waters. Florida Statutes Chapter 373 Part IV describes the process of obtaining a permit before engaging in such activities. To acquire a permit, there must be "reasonable assurance" that the proposed activity will not degrade water quality standards and will not contravene the public interest.[110] In determining whether the activity is consistent with the public interest, the governing authority will look at a number of factors:

1. Whether the activity will adversely affect the public health, safety, or welfare or the property of others;
2. Whether the activity will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats;
3. Whether the activity will adversely affect navigation or the flow of water or cause harmful erosion or shoaling;
4. Whether the activity will adversely affect the fishing or recreational values or marine productivity in the vicinity of the activity;
5. Whether the activity will be of a temporary or permanent nature;

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[106] *See* FLA. CONST. art. X § 11; FLA. STAT. § 253.02-03.
[107] FLA. STAT. § 253.77(1).
[108] FLA. ADMIN. CODE ANN. r. 18-21(2)(i).
[109] *Id.* r. 18-20.004(2)(d)(4).
[110] FLA. STAT. § 373.414.

6. Whether the activity will adversely affect or will enhance significant historical and archaeological resources ... ; and
7. The current condition and relative value of functions being performed by areas affected by the proposed activity.[111]

Permits are issued through a program implemented jointly by Florida's DEP and the state's regional water management districts.[112] In weighing the requisite factors, the governing agency will assess the activity's direct, secondary, and cumulative impacts to the state's waters.[113] In addition to the authority to issue individual permits, the permitting authority may exempt by statute or rule activities that would have only minor impacts to the state's waters and may grant "noticed general permits" for larger but similarly benign projects.[114]

3. Notice General Permits

Chapter 62-341 of the Florida Administrative Code outlines the noticed general permit regulatory scheme and codifies the various noticed general permits the state has adopted.[115] Such permits are for "those activities that have been determined to have minimal impacts to the water resources of the District, both individually and cumulatively, when conducted in compliance with the terms and conditions of the general permit."[116]

Noticed general permits for dredging frequently require permittees to minimize adverse impacts to sovereign submerged lands and to mitigate damages to natural seagrass communities.[117] Permits have included requirements to keep detailed information on the dredged material disposal site, to provide a natural resource inventory of the dredging area, and to give information on dredging done in the area within the past five years.[118] Permits have further required water quality monitoring and relocation of seagrasses, corals, sponges, and oysters within the dredge footprint.[119] In adherence to duties under the ESA, state permitting authorities have mandated observers to be on site to look for manatees whenever dredging takes place and to stop dredging if a manatee

[111] *Id.* § 373.414(1)(a)(1)-(7).
[112] *See* FLA. DEP'T OF ENVT'L PROT., OVERVIEW OF THE WETLAND AND OTHER SURFACE WATER REGULATORY AND PROPRIETARY PROGRAMS IN FLORIDA 2 (Feb. 23, 2011), http://www.dep.state.fl.us/water/wetlands/docs/erp/overview.pdf.
[113] *Id.* at 7 ("Secondary impacts are those actions or actions that are very closely related and directly linked to the activity under review that may affect wetlands and other surface waters and that would not occur but for the proposed activity ... Cumulative impacts are residual adverse impacts to wetlands and other surface waters in the same drainage basin that have or are likely to result from similar activities (to that under review) that have been built in the past, that are under current review, or that can reasonably be expected to be located in the same drainage basin as the activity under review.")
[114] *Id.* at 4.
[115] FLA. ADMIN. CODE r. 62.341.
[116] *Id.* r. 62.341.201(1).
[117] *Id.* r. 341.494(2)(c)-(d).
[118] *Id.* r. 341.494(3)(a)(3), r. 62-341.494(3)(a)(6), r. 62-341.494(3)(a)(7).
[119] *Id.* r. 341.494(3)(a)(9), r. 62-341.494(3)(a)(10)(c).

comes within fifty feet of dredging equipment.[120] These requirements all relate to minimizing impacts to seagrass communities and to animals in the dredge area.

4. Uniform Mitigation Assessment Method

If there is a loss of natural seagrass communities, permits also frequently mandate mitigation. The extent of mitigation required for a particular project is determined by application of the Uniform Mitigation Assessment Method (UMAM). Mandated by Florida Statutes § 373.414(18) and promulgated through Florida Administrative Code Rule 62-345, UMAM is Florida's exclusive process for establishing the acreage of mitigation needed to offset adverse impacts to the state's wetlands and surface waters and to award and deduct mitigation bank credits.[121] UMAM provides a practical, consistent, and scientifically sound process that takes into account the varied ecological communities found throughout the state.[122] In determining appropriate mitigation, UMAM considers the impacted water's current condition, location, use by wildlife, hydrologic condition, and uniqueness.[123]

As promulgated, UMAM is most easily applied to wetland mitigation assessments and must be interpreted for use on seagrass mitigation. UMAM uses three categories of indicators to determine wetland function and assess a wetland score: location and landscape support, water environment, and community structure.[124] For each category, the wetland indicators are judged as optimal, moderate, minimal, or not present.[125] Because of their distinct ecology, seagrass beds inherently have many of the wetland indicators and functions that may be absent in terrestrial wetlands.

For example, wetlands may occur in an upland matrix, but seagrasses only occur in an aquatic matrix of mixing salt and freshwater. Their location in an aquatic matrix as opposed to an upland matrix means that virtually all seagrass beds will be connected to other habitats. This results in seagrass beds consistently receiving high scores for the location category.

For water environments, there is only one assessment point specific to seagrass: "water depth, wave energy, currents, and light penetration are optimal for the type of community being evaluated."[126] Wetlands are typically evaluated on eleven characteristics to determine the quality of the water environment, thus giving regulators more criteria to work with when evaluating proper mitigation levels. Under community structure, there is again only one assessment for evaluation of

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[120] *Id.* r. 62-341.494(3)(a)(10)(g)(8).

[121] *See* Uniform Mitigation Assessment Method, FLA. ADMIN. CODE r. 62-345.100(1). *See also* FLA. STAT. § 373.414(18). For more information on UMAM, see CLARK HULL ET AL., CHAPTER 62-345: FLORIDA'S UNIFORM MITIGATION ASSESSMENT METHOD 2, http://www.dep.state.fl.us/water/wetlands/docs/mitigation/umam_basics.pdf.

[122] CLARK HULL, ET AL., CHAPTER 62-345: FLORIDA'S UNIFORM MITIGATION ASSESSMENT METHOD 3, http://www.dep.state.fl.us/water/wetlands/docs/mitigation/umam_basics.pdf.

[123] *See* FLA. ADMIN. CODE r. 62-345.300(2). *See also* CLARK HULL ET AL., CHAPTER 62-345: FLORIDA'S UNIFORM MITIGATION ASSESSMENT METHOD 4, http://www.dep.state.fl.us/water/wetlands/docs/mitigation/umam_basics.pdf.

[124] FLA. ADMIN. CODE r. 62-345.500(6).

[125] *Id.* r. 62-345.500(5).

[126] *Id.* r. 62-345.500(6)(b)(1)(l).

submerged aquatic communities such as seagrass: to receive a high score there simply has to be no evidence of siltation or algal growth.[127]

If permitting authorities are to continue using UMAM to determine seagrass mitigation, the rule should be updated to include more information specific to the ecology of seagrass beds. For location and landscape, it is important to know whether the seagrass is located near or within other beds, whether there are impediments to the movement of wildlife and water, and the nature of upland land uses (e.g., the percentage of the land that is impermeable and whether there are structures such as docks, marinas, and water treatment facilities). When looking at the water environment, it is necessary to know if the tidal cycle, climate, available light, water depth, turbidity, water quality, and erosion levels are appropriate for seagrass. To determine if a seagrass community is healthy, one must measure the amount of epiphytic growth and siltation and one must determine the density, distribution, canopy presence, and regeneration of the seagrass bed. Including these criteria in UMAM would allow those engaged in seagrass restoration to better assess the functions of existing beds.

5. Seagrass Mitigation Banking

In addition to the limitations caused by using UMAM's wetland-focused criteria when assessing seagrass mitigation needs, a further hurdle to effective seagrass restoration is caused by the state's lack of seagrass mitigation banks. In 2008, the Florida Legislature enacted a bill to amend Florida Statutes Chapter 253 to allow for the establishment of seagrass mitigation banks on sovereign submerged lands.[128] CS/HB 7059 added an eighteenth subsection to Florida Statutes § 253.03, reading:

> The Board of Trustees of the Internal Improvement Trust Fund may ensure the preservation and regeneration of seagrass, as defined in s. 253.04(4)(a)2., by providing for the establishment of seagrass mitigation banks, pursuant to s. 373.4136, to offset the unavoidable impacts of projects where such banks meet the applicable public interest test of chapters 253 and 258. This subsection shall not prohibit mitigation for impacts to seagrass or other habitats on sovereignty submerged lands for other types of projects, or for projects occurring on nonsovereign submerged lands, upon applicable approval of the board of trustees.[129]

Two months after its enactment, however, Governor Charlie Crist vetoed the bill.[130] Though citing concern that seagrass mitigation banks could streamline projects that negatively impact

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[127] *Id.* r. 62-345.500(6)(c)(1)(a)(IX).

[128] For information on the history of the bill, as well as the bill's text, see FLORIDA HOUSE OF REPRESENTATIVES CS/HB 7059 – FISH AND WILDLIFE (2008), http://www.myfloridahouse.gov/sections/Bills/billsdetail.aspx?BillId=39493.

[129] FLA. CS/HB 7059 (2008), *available at* http://www.myfloridahouse.gov/Sections/Documents/loaddoc.aspx?FileName=_h7059er.xml&DocumentType=Bill&BillNumber=7059&Session=2008.

[130] *See* FLORIDA HOUSE OF REPRESENTATIVES CS/HB 7059 – FISH AND WILDLIFE (2008), http://www.myfloridahouse.gov/sections/Bills/billsdetail.aspx?BillId=39493.

seagrass beds,[131] Governor Crist's veto effectively served to eliminate a potential tool for seagrass restoration. UMAM is designed to award and to deduct mitigation bank credits for activities affecting the state's wetlands and surface waters; however, the lack of seagrass mitigation credits makes this goal difficult to effectuate for seagrass restoration projects. Consequently, parties required to mitigate for their impacts to seagrass beds must engage in a tedious process of searching for alternative mitigation for each surface water-impacting activity that results in the loss of seagrass beds.

IV. Alternative Methods to Mitigate for Seagrass Loss

Despite the lack of seagrass mitigation credits, permitting authorities have tools available to permit seagrass mitigation efforts. One mitigation option used in southwest Florida is the establishment of No Internal Combustion Motor Zones (NICMZ).[132] NICMZs permit only the use of electric motors and prohibit the use of internal combustion motors in designated areas.[133] Along with the establishment of these zones, the permittee is required to monitor seagrasses in the area to document change in coverage and number of prop scars.[134] In other areas of Florida, authorities have required permittees to fund the building of runoff treatment plants or install non-regulatory signs to inform boaters of shallow water seagrass beds.[135]

Non-regulatory signs have proven successful in deterring boaters from entering sensitive seagrass areas. In 2007, the Sebastian Inlet District constructed a channel that impacted 1.25 hectares of seagrass habitat.[136] Several mitigation projects were completed to offset the impacts. One project required the permittee to place informational signs reading, "Caution, Shallow Water, Seagrass Area" around the inlet's seagrass beds. The signs clearly delineate forty-five hectares of seagrass beds. If boaters follow the recommendations, forty-five hectares will be protected from boating impacts.[137] Within three years of regulators installing the signs, the area experienced the regeneration of one hectare of seagrass, for a current total of forty-six acres of protected area.[138]

The Sebastian Inlet District also conducts an annual inventory of anthropogenic damage within the newly protected areas. Before the District erected signage in 2007, there were 506 verified scars in the beds; by 2009, the number of verified scars dropped to 188.[139] This number remained stable into 2010, with only 189 verified scars.[140] One particular area of the beds showed an increase in scarring from 2007 to 2010; all other areas showed a decrease. This may point to a need to improve signage at this particular location. The overall reduction in scarring from 2007 to 2010 indicates that boaters heed the advice of the signage and use the channel.

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[131] *Crist Kills Seagrass Bill Enviros Didn't Like*, ORLANDO SENTINEL (JUNE 30, 2008), http://blogs.orlandosentinel.com/news_politics/2008/06/crist-kills-sea.html.
[132] FLA. ADMIN. CODE r. 62-341.494(2)(d).
[133] *Id.*
[134] *Id.* r. 62-341.49(2)(d)(3).
[135] PBS&J, SEBASTIAN INLET CHANNEL, COMPREHENSIVE SEAGRASS MITIGATION PROGRAM, YEAR 3 MONITORING REPORT, prepared for Sebastian Inlet District, 1 (2011).
[136] *Id.*
[137] *Id.*
[138] *Id.* Current estimates are for 2010.
[139] *Id.* at 28.
[140] *Id.*

Governing authorities implemented a similar project in Tampa Bay in 1992. Two different types of signs were installed in this project. Some areas were signed non-combustion engine zones (an essential equivalent to the NICMZs mentioned above) while others were simply signed, "Caution Shallow Water Seagrass Area."[141] Data shows no difference in the number of new scars between the two areas.[142] Due in part to lobbying pressures from boating advocates, current state regulations make the installation of exclusion zone signage more difficult to effectuate than the installation of non-regulatory signage. As the two zones in the Tampa Bay project were equally effective in protecting seagrass, the governing authorities recommended that exclusion zones be changed to caution zones. This would achieve the same result of seagrass protection without relying on the disfavored regulatory signage.

V. Conclusion: A Regional Solution

There is no doubt that seagrass beds provide invaluable ecosystem services. As coastal populations continue to grow, there will continue to be anthropogenic effects on seagrass beds; therefore, it is essential that law and policy facilitate seagrass restoration. At a regional level, areas in need of restoration should be identified and prioritized using good science. The most urgent needs should be addressed first rather than addressing needs through a piecemeal, uncoordinated effort.[143] Areas slated for restoration could become part of a mitigation bank used to fund further restoration. Mitigation banks should be located in each region so that local impacts result in local mitigation. This is not always the case with terrestrial wetland mitigation. Further, policymakers should consider amending UMAM to include seagrass-specific ecosystem services. This will enable permitting authorities to assess seagrass systems' worth and to appropriately mitigate for their losses. Amending state policy in these regards could facilitate efforts to restore the state's seagrass beds while reasonably accommodating the inevitable activities that will continue to impact the state's sovereign submerged lands.

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[141] Jacob F. Stowers, Eric Fehrmann & Andrew Squires, *Seagrass Scarring in Tampa Bay: Impact Analysis and Management Options, in* SEAGRASS MANAGEMENT: IT'S NOT JUST NUTRIENTS 48 (H.S. Greening, ed., 2000).

[142] *Id.*

[143] There continue to be growing efforts to facilitate ecological planning at the regional level. One recent initiative is NOAA's Coastal and Marine Spatial Planning Program (CMSP Program). *See* National Oceanic and Atmospheric Association, Coastal and Marine Spatial Planning, NOAA's CMSP Programing, http://cmsp.noaa.gov/program/index.html. The CMSP Program is a federal, state, and tribal initiative that will provide technical and monetary assistance to regional ecological management. The Program will provide "[1] Observation and monitoring programs, [2] Geospatial referencing, web mapping, and spatial analysis tools, [3] Navigation charts and ocean mapping data, [4] Ecosystem mapping and characterization, [5] Data management, distribution, analysis, and archiving, [6] Weather and climate prediction, [7] Ecological modeling and forecasting, [and] [8] Social and economic science-based assessments." *Id.* The CMSP Program may prove a valuable resource for advocates of seagrass restoration.

Analyzing Uncertainty: Issues of Purely Economic Losses and Preemption Facing Individuals Injured by an Oil Spill

P. Alex Quimby[1]

Abstract: Maritime tort liability involves a complex web of various state and federal laws. For over a century, courts have struggled to determine when potential state remedies are preempted by either federal statutory or general maritime law. Within this complicated framework lies the sub-issue of whether an individual can recover purely economic losses, that is, for torts that injure people's economic well-being despite causing no physical damage to their property. The explosion of the Deepwater Horizon and subsequent oil spill brought both of these issues to the forefront. Lawsuits currently matriculating through the courts have revealed that despite Congress's attempt to clarify these issues with the Oil Pollution Act of 1990, it failed in both respects. This article attempts to shed light on the uncertainty and unravel the appropriate interpretation of the law as it stands today. Congress could provide clarity to these issues by focusing on the underlying policy goals of maritime law: uniformity, fairness and predictability. These goals can be accomplished through a divided system, in which offshore oil drillers are strictly liable for the economic losses they cause to certain pre-determined foreseeable parties. All other maritime torts would be subjected to the traditional, bright-line Robins Dry Dock *rule. Enacting this approach in a manner that clearly displaces the other relevant federal laws and preempts conflicting state laws would solve much of the uncertainty that has plagued maritime tort liability for far too long.*

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I. Introduction

On April 20, 2010, while completing an exploratory well forty miles from the southeast coast of Louisiana, the Deepwater Horizon offshore drilling rig burst into flames.[2] The explosion killed eleven rig workers and started an oil spill that would devastate the Gulf of Mexico and its coastline.[3] The rig was at the forefront of industry technology, having recently drilled the longest well in history.[4] The well was connected to the Deepwater Horizon by a tube known as a "riser."[5] A highly pressurized mix of petroleum and natural gas lingers at the bottom of an oil well.[6] When a small amount of methane escaped the well the resulting pressure ascended through the riser and triggered the deadly blast.[7] The Deepwater Horizon's blowout preventer, designed to seal off the well in anticipation of an incident, failed to activate.[8] Months later the well was finally capped, but the oil that had already been released continued to spread throughout the Gulf: some of it formed a sheen atop the water while a substantial amount developed into plumes beneath the surface.[9] The spill caused tremendous damage to the marine environment in the Gulf and was described by

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[2] Cutler Cleveland, *Deepwater Horizon Oil Spill*, EARTH PORTAL, http://www.earthportal.org/?p=1964 (last visited May 26, 2011). The Deepwater Horizon was not drilling to produce oil at the time of the explosion. Instead, the casing that lined the well was set to be capped with a cement plug so that the well could later be used for production. *See Deepwater Horizon Oil Spill*, THE ENCYCLOPEDIA OF EARTH, http://www.eoearth.org/article/Deepwater_Horizon_oil_spill (last visited May 26, 2011).

[3] *Id.*

[4] Transocean, News and Events, *Deepwater Horizon Drills World's Deepest Oil & Gas Well*, http://www.deepwater.com/fw/main/IDeepwater-Horizon-i-Drills-Worlds-Deepest-Oil-and-Gas-Well-419C151.html (stating that the Tiber Well in the Gulf of Mexico extended a vertical depth of 35,000 feet, or more than six miles).

[5] Emmet Mayer III & Dan Shea, *What Happened on the Deepwater Horizon,* NOLA.COM, May 6, 2010, http://media.nola.com/news_impact/other/oil-cause-050710.pdf.

[6] David Batty, *Deepwater Horizon Blast Triggered by Methane Bubble, Report Shows*, GUARDIAN NEWS AND MEDIA, May 8, 2010, http://www.guardian.co.uk/environment/2010/may/08/deepwater-horizon-blast-methane-bubble.

[7] *Id.*; *See also, What Happened*, *supra* note 5 (explaining that either the cement used to separate the metal casing from the sediment or the cement used to seal off the well allowed a "huge column of natural gas into the well pipe.").

[8] Mika Grondahl, et. al, *Investigating the Cause of the Deepwater Horizon Blowout*, N.Y. TIMES, June 21, 2010, http://www.nytimes.com/interactive/2010/06/21/us/20100621-bop.html. The individual component of the blowout preventer that actually cuts the drill pipe before completely sealing the well, resulting in the physical separation of the rig from the well, is known as a blind shear ram. At least one worker on the rig hit the emergency button that should have triggered the blowout preventer's blind shear ram within 30 seconds. *Id.*

[9] Robert Lee Holtz, *Oil Plume from Spill Persists, Data Show*, WALL STREET JOURNAL, Aug. 20, 2010, http://online.wsj.com/article/SB10001424052748703791804575439551236042216.html (citing one scientist's estimation that a particular plume was the size of Manhattan).

some as the "worst environmental disaster America has ever faced."[10] The Deepwater Horizon spill's environmental effects are ongoing and will take years to fully understand.[11]

The Deepwater Horizon was owned by Transocean, the world's largest offshore drilling contractor and leased at the time to British Petroleum (BP).[12] Employees of both companies were operating the rig at the time of the explosion.[13] At least four other companies are also potentially liable for the damage inflicted by the spill.[14] While BP agreed to set aside a $20 billion fund to honor all "legitimate claims,"[15] lawsuits against the company have already been filed.[16] These lawsuits will continue to occur when some parties are inevitably dissatisfied with the discretionary payout they receive from the fund.[17]

This paper will focus on the legal remedies available to those injured by the Deepwater Horizon spill; not the non-legal remedies available to claimants through the BP fund. For the sake of clarity, this paper will refer only to the potential liability of BP, who has been designated a "responsible party," with the understanding that the legal framework surrounding the Deepwater

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[10] President Barack Obama, Remarks by the President to the Nation on the BP Oil Spill, June 15, 2010, *transcript available at* http://www.whitehouse.gov/the-press-office/remarks-president-nation-bp-oil-spill.

[11] *See* Elana Schor, *Oil Dispersants Shifting Ecosystem Impacts in Gulf, Scientists Warn*, N.Y. TIMES, July 30, 2010, http://www.nytimes.com/gwire/2010/07/30/30greenwire-oil-spill-dispersants-shifting-ecosystem-impac-95608.html. As the spill continued, BP sprayed two million gallons of dispersants at the site of the leaking oil, designed to rapidly breakdown oil droplets. *Id.* While the use of the dispersant reduced the visibility of the oil, some scientists warned that when mixed with oil it "pose[s] grave health risks to marine life and human health." *Id.*

[12] Lisa Flam, *11 Workers Still Missing After Oil Rig Explosion*, AOLNEWS.COM, Apr. 21, 2010, http://www.aolnews.com/nation/article/oil-rig-explodes-off-louisiana-workers-missing/19448238.

[13] Derek Jones & Jason Kurtz, *Deepwater Horizon: Torrent of Oil, Flood of Insurance Issues*, MILLIMAN, INC., July 23, 2010, http://insight.milliman.com/article.php?cntid=7272.

[14] *Id.* BP owned 65% of the mineral rights to the well, with the remaining shares being owned by Anadarko Petroleum Corporation and Mitsuit Exploration Company of Japan. *Id.* The blowout preventer that failed moments before the explosion was manufactured by Cameron International. *Id.* Additionally, Halliburton was responsible for providing drilling services to cement the well. *Id.*

[15] Press Release, BP, BP Establishes $20 Billion Claims Fund for Deepwater Horizon Spill and Outlines Dividend Decisions (June 16, 2010), *available at* http://www.bp.com/genericarticle.do?categoryId=2012968&contentId=7062966.

[16] *See, e.g.* B.P. Defendants' Reply Brief in Support of Their Motion to Dismiss Plaintiff's Complaint, 2010 WL 3164006 (S.D. Ala. Aug. 10, 2010) (outlining the claims brought against BP by a yacht seller).

[17] *Id. See also* Sabrina Wilson, *BP Fund Administrator Faces Firestorm,* FOX8, Sept. 13, 2010, http://www.fox8live.com/news/local/story/BP-fund-administrator-faces-firestorm/DgX0tWEO3kenNb_MFAYUcw.cspx (reporting that the fund's administrator "faced boos and hissing when he met with scores of dissatisfied people."). Florida Attorney General Bill Nelson stated the fund's manager would "draw a line and those on the other side of the line are going to sue"). *See Feinberg Says He's Not Trying to Restrict Payouts for Oil-Spill Claims,* M2M, July 6, 2010, http://m2m.tmcnet.com/news/2010/07/06/4887209.htm.

Horizon spill will be similar for most of the potential defendants.[18] As a result of this designation, BP is potentially liable without limit due to its disregard for warning signs[19] and multiple violations of industry guidelines.[20] This paper will address the potential recovery of private parties in Florida only, rather than government trustees.

In the months after the accident, oil surfaced onto various Florida beaches.[21] Unfortunately, the consequences of an oil spill extend much farther than the area it physically contacts. The mere specter of oil on the horizon can adversely impact major industries. Millions of people have traditionally traveled to Florida each year to visit its unspoiled beaches and consequently supplement the State's economy.[22] One economist estimated that Florida's tourism industry will experience a $2.2 billion decrease in revenue and a loss of 39,000 jobs as a result of the spill.[23] A fishing moratorium, at one point covering approximately one third of the Gulf's waters,[24] cost

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[18] BP has been designated as the "responsible party" under the Oil Pollution Act of 1990 for the Gulf Oil spill because it held the drilling permit at the time of the incident. *See* NATHAN RICHARDSON, RESOURCES FOR THE FUTURE, DEEPWATER HORIZON AND THE PATCHWORK OF OIL SPILL LIABILITY LAW, http://www.rff.org/RFF/Documents/RFF-BCK-Richardson-OilLiability.pdf. The result of this designation is that BP can be held liable as the one who "caused" the spill, and will then have to sue other potentially liable parties in a contribution action to recover costs. *Id.*

[19] *See* Fact Sheet, BP, Government Claims and Funding Requests (Aug. 2010), http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/gom_response/STAGING/local_assets/downloads_pdfs/Government_Claims_and_Funding_Requestsfact_sheet.pdf (acknowledging that the "responsible party" designation requires BP to pay whatever "legitimate claims" exist, so far as required by statutes and regulations.). Ian Urbina, *Documents Show Early Worries About Safety of Rig*, N.Y. TIMES, May 29, 2010, http://www.nytimes.com/2010/05/30/us/30rig.html (reporting that internal BP documents revealed a concern over critical apparatus, including the blowout preventer, months prior to the explosion); Michael Kunzelman, *BP Waives $75M Cap for Some Oil Spill Claims*, ABCNEWS.COM, Oct. 18, 2010, http://abcnews.go.com/Business/wireStory?id=11912068 (reporting that BP waived the Oil Pollution Act's $75 million cap on its liability for certain economic damage claims).

[20] Paul Harris, *BP Accused of Ignoring Internal Report of Deepwater Leak*, GUARDIAN.CO.UK, July 20, 2010, http://www.guardian.co.uk/environment/2010/jul/20/bp-oil-spill-cleanup-threatened-tropical-storms (reporting that former President George W. Bush's interior secretary stated that "[i]f regulations on the books and industry best guidelines had been followed properly, there might not have been a blowout ... It appears that BP violated all those regulations that were on the books.").

[21] Associated Press, *Oil Touches Down on Florida Beaches*, USA TODAY, June 5, 2010, http://www.usatoday.com/news/nation/2010-06-05-gulf-oil-spill_N.htm.

[22] *See Florida Quick Facts*, STATEOFFLORIDA.COM, http://www.stateofflorida.com/Portal/DesktopDefault.aspx?tabid=95 (last visited Nov. 19, 2010) (noting that in 2004 76.8 million tourists visited Florida and that tourism contributes $57 billion to Florida's economy).

[23] Michael Peltier, *Oil Spill Ripples through Florida Economy*, REUTERS, June 9, 2010, http://www.reuters.com/article/idUSTRE65868720100609. *But see* David Hammer, *Commission: Economic Impacts of Oil Spill, Drilling Moratorium, and Media Attention Discussed*, NOLA.COM, July 12, 2010, http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/07/commission_economic_impacts_of.html (claiming that the extensive media coverage of the spill exasperated the negative effect on Florida's tourism industry).

[24] Press Release, Natural Resources Defense Council, Court Lifts Moratorium, Green Lights More Deepwater Drilling in the Gulf (June 22, 2010), http://www.nrdc.org/media/2010/100622.asp.

commercial fishermen in Florida and other coastal states approximately $2.5 billion.[25] Moreover, these numbers do not take into account the lost revenue experienced by restaurants, fish markets, and grocery stores heavily reliant on the sale of Gulf seafood. In addition to the food and tourism industries, the value of real estate along the coasts of Gulf states like Florida may be driven down 10% over the next three years with losses totaling $4.3 billion.[26]

Individuals seeking to recover for economic losses in which no oil physically contacted their property (i.e., "purely economic losses") must sift through a complex web of state and federal laws. The goal of this article is to explore the uncertainty that surrounds the recovery of purely economic losses and how federal preemption of state law affects that recovery. In particular, this article will discuss how the laws of Florida fit into this framework. This article strives to simplify the uncertainty in a way that makes the major issues more comprehensible and to provide the most reasonable interpretation of them.

First, one must understand general maritime law, a judicially developed body of federal law extending from the high seas all the way to Florida's coast. General maritime law provides the traditional backdrop for torts on the high seas. In the context of oil spills, general maritime law requires that individuals who seek economic losses must first prove that oil damaged their property, unless they are commercial fishermen. However, the states are vested with some amount of "police power" to protect their coasts and its citizens from oil pollution. How far state law can intrude into general maritime law to provide a remedy before it is preempted has perplexed courts for over a century. In 1990, Congress passed the Oil Pollution Act of 1990 (OPA) with the hope of providing clarity to this legal framework. Over twenty years after OPA's enactment courts still cannot agree whether the statute provides for purely economic losses or how it affects general maritime law and state law. In the midst of the Deepwater Horizon spill the Florida Supreme Court decided *Curd v. Mosaic*.[27] According to some commentators, *Mosaic* provides individuals with a remedy under both state statutory and common law for purely economic losses.

The final section of this paper seeks to provide guidance. The goal of general maritime law is to provide uniformity for maritime commerce. However, the uncertainty surrounding federal preemption of state law and what role OPA plays prevents this goal from being accomplished. General maritime law also provides a predictable rule for parties seeking purely economic losses. But this rule is unfair to parties not classified as "commercial fishermen" because they cannot recover for purely economic losses. This paper will conclude with a proposal on how to create a system of liability that provides uniformity, predictability, and fairness in the realm of maritime torts.

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[25] Bryan Walsh, *With Oil Spill (and Blame) Spreading, Obama Will Visit Gulf*, TIME, May 1, 2010, http://www.time.com/time/health/article/0,8599,1986323,00.html.

[26] John Gittelsohn, *Oil Spill May Cost $4.3 Billion in Property Values*, BLOOMBERG, June 11, 2010, http://www.bloomberg.com/news/2010-06-11/bp-spill-may-cost-homeowners-4-3-billion-in-property-values-along-shore.html.

[27] 39 So.2d 1216 (Fla. 2010).

II. The Law Before OPA

A. *Basic Maritime Law*

The Constitution extends federal judicial power to "all Cases of admiralty and maritime Jurisdiction."[28] This federal jurisdiction, however, has never been exclusive.[29] The Judiciary Act of 1789[30] stated that the "suitors ... [shall have] the right of a common law remedy, where the common law is competent to give it."[31] The modern expression of this provision is not limited to "common law," allowing for "all other remedies to which [suitors] are otherwise entitled."[32] Therefore, in determining liability for damages that stem from an accident on the high seas, a court must consider federal statutory and general maritime law, as well as state statutory and common law.

One might ask why the Framers were not content to simply leave admiralty law as a matter for the states alone to deal with. Similar to the rationale of allowing broad federal power under the Commerce Clause,[33] the goal of maritime law is to create a uniform and predictable set of rules.[34] If the authority to make rules concerning the United States' collective waters were completely delegated to and divided up amongst each state then a vessel crossing from one jurisdiction to the next would have difficulty complying with different rules at every port; the vessel would also be subject to a different standard and extent of liability depending on the arbitrary zone through which it was currently traveling.[35]

Initially, a wrong must be identified as a "maritime tort" to fall within the admiralty jurisdiction,[36] and if so will be subject to the judicially developed general maritime law.[37] A tort meets this definition if it satisfies the "locality" and "maritime nexus" requirements.[38] The locality requirement is satisfied when the tort occurs on navigable waters or the injury that is suffered on land was caused by a vessel on navigable water.[39] The Deepwater Horizon was located in navigable waters when its explosion allowed oil to be released into the Gulf.[40]

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[28] U.S. CONST., art. III, § 2, cl. 1.
[29] American Dredging Co. v. Miller, 510 U.S. 443, 446 (1994).
[30] Judiciary Act of 1789, §9, 1 Stat. 76-77.
[31] *Id.*
[32] 28 U.S.C. § 1333.
[33] *See* Thomas B. Colby, *Revitalizing the Forgotten Uniformity Constraint on the Commerce Power*, 91 VA. L. REV. 249, 266 (2005) (observing that "the Framers of the Federal Constitution were deeply concerned with both 'uniform rules' and 'uniform treatment' in all commercial matters.").
[34] *See* Steven R. Swanson, *Federalism, The Admiralty, and Oil Spills*, 27 J. MAR. L. & COM. 379, 380 (1996).
[35] *Id.* at 381. In fact, admiralty was considered so vital that it was "the only substantive area in which subject matter jurisdiction was specifically granted to the federal courts by the Constitution." *Id.*
[36] East River S.S. Corp. v. Transamerica Delaval, Inc., 476 U.S. 858, 863-64 (1986).
[37] *Id.* at 865.
[38] In re the Exxon Valdez, 767 F. Supp. 1509, 1511 (D. Ala. 1991).
[39] Jerome B. Grubart, Inc. v. Great Lakes Dredge & Dock Co., 513 U.S. 527, 527 (1995).
[40] As mentioned, the Deepwater Horizon was located forty miles into the Gulf's waters. *See also* Sea Vessel, Inc. v. Reyes, 23 F.3d 345 (11th Cir. 1994) (showing that even a vessel in dry dock on navigable waters undergoing repairs can satisfy the locality test).

The maritime nexus requirement is satisfied when: (1) the general features of the type of incident involved are potentially disruptive to maritime commerce and (2) the character of the activity is substantially related to traditional maritime activity.[41] The Deepwater Horizon spill was potentially disruptive to the routes of shipping vessels and led to a moratorium on areas frequented by commercial fishermen.[42] The character of the activity on the Deepwater Horizon was related to traditional maritime activity because offshore oil drilling has been occurring in U.S. waters for well over a hundred years.[43] While courts have held that activities like swimming or flying an airplane over the water do not meet the "maritime nexus" prong,[44] they have consistently held that oil spills can be maritime torts.[45] But while claimants seeking to recover for harm caused by the Deepwater Horizon spill may be subject to substantive maritime law, that body of jurisprudence can be supplemented by state law in certain circumstances. How much state law can supplement the general maritime law is crucial to determining whether a claimant can recover for purely economic losses.

B. The Economic Loss Rule

In general maritime law, an individual cannot recover for economic losses absent physical injury to a property interest.[46] This principle is known as the *Robins Dry Dock* rule. However, courts have carved out a major exception to the *Robins Dry Dock* rule by allowing commercial fishermen to recover for economic losses without physical injury to a property interest.[47] The rationale for this

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[41] Jerome B. Grubart, Inc., 513 U.S. at 527 (describing how the maritime nexus requirement can be satisfied).

[42] *See* AP, *BP Well is Dead, but Gulf Challenges Live On*, MSNBC.COM, Sept. 9, 2010, http://www.msnbc.msn.com/id/39263335/ns/us_news/t/bp-well-dead-gulf-challenges-live/ (reporting that the ban on fishing in the Gulf increased unemployment amongst commercial fishermen and caused a loss of 8,000-12,000 oil-related jobs); *See also* Bryan Walsh, *Is the Deepwater Drilling Moratorium Worse Than The Oil Spill*, TIME, July 13, 2010, http://ecocentric.blogs.time.com/2010/07/13/is-the-deepwater-drilling-moratorium-worse-than-the-oil-spill/ (reporting that 9 out of 10 taxpayers in the Lafourche Parish in Southern Louisiana were part of the oil and gas industry and that that the post-Deepwater Horizon ban had a "crippling effect" on the economy there).

[43] *See* Bureau of Ocean Energy Management, Regulation and Enforcement, History of the Offshore Oil and Gas Development in Louisiana, http://www.gomr.boemre.gov/homepg/regulate/environ/louisiana_coast.html (noting that the first submerged oil wells in salt water were drilled in 1896 from piers extending off California's Pacific coast).

[44] Jerome B. Grubart, Inc. 513 U.S. at 540.

[45] *See, e.g.,* La. ex rel. Guste v. M/V Testbank, 752 F.2d 1019 (5th Cir. 1985); In re the Exxon Valdez, 767 F. Supp. 1509, 1514 (D. Alaska 1991); U.S. v. Bear Marine Serv., 509 F. Supp. 710, 717 (E.D. La. 1980).

[46] Robins Dry Dock & Repair Co. v. Flint, 275 U.S. 303 (1927) (disallowing recovery for a vessel charterer in maritime tort where damage was purely economic in nature). *See also* Thomas J Wagner, *Recoverable Damages Under the Oil Pollution Act of 1990*, 5 U.S.F. MAR. L.J. 283, 295 (1993) (noting that the Robins Dry Dock rule has become an "entrenched principle of maritime law").

[47] Union Oil Co. v. Oppen, 501 F.2d 558, 567 (9th Cir. 1974); *See also* DONNA R. CHRISTIE & RICHARD G. HILDRETH, COASTAL AND OCEAN MANAGEMENT LAW 297 (1994) (observing that "[i]n the context of an oil spill … the Robins Dry Dock rule would preclude recovery in maritime tort for businesses, such as fish processors, boat charterers, and lodges and for the use and enjoyment claims by recreational users, such as kayakers, photographers, and sport fishermen.").

exception appears to be based on the fact that commercial fishermen make more direct use of the sea's resources than other potential claimants.[48] Of course, if a non-commercial fisherman can make an initial showing of physical damage they can then recover for any consequential damages (including economic losses) that may result.[49]

In contrast to general maritime law, some state laws permit individuals to recover for economic losses in certain situations where no physical damage has occurred.[50] Therefore, when a party seeks recovery for economic losses, whether a particular state law is preempted by general maritime law (or a federal statute) can be dispositive of his ability to recover anything at all.[51]

C. *Pre-*Askew *Case Law*

In 1917, the decision in *Southern Pacific Co. v. Jensen*[52] represented the Supreme Court's most rigid adherence to uniformity in admiralty law.[53] In *Jensen*, the Court adopted a three-part test in finding that a state law is invalid if it: "contravenes the essential purpose expressed by an act of Congress or works material prejudice to the characteristic features of the general maritime law, or interferes with the proper harmony and uniformity of the law in its international and interstate relations."[54] The case concerned the permissibility of a New York workmens' compensation statute.[55] Despite observing that there was no federal legislation similar to the state statute, the Court struck down the state law due to the need for uniformity in maritime matters.[56]

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[48] Christie & Hildreth, *supra* note 47 (noting that while "it is not entirely clear that there exists a principled rationale to distinguish commercial fishermen from others who use the sea, this exception has been followed."). Additionally, even if a party is classified as a commercial fisherman they will still have to prove the standard elements of a tort. In particular, it may be difficult for a fisherman to show that an oil spill proximately caused his lost profits.

[49] 6 BRUNER & O'CONNOR CONSTRUCTION LAW § 19:10 (2010) (observing that economic losses stemming from a tort can be recovered when there is damage to the property).

[50] *See, e.g.*, Ballard Shipping Co. v. Beach Shellfish, 32 F.3d 623 (1st Cir. 1994) (upholding a Rhode Island statute that provided for purely economic losses).

[51] *See* Steve Block, *Exclusively Economic Damages are not Recoverable In Maritime Tort, but they may be under State Law,* FORWARDERLAW, Sept. 1, 2008, http://www.forwarderlaw.com/library/view.php?article_id=530 (stating that whether one can recover depends on which law applies and that when state law allows recovery for purely economic losses "state and federal courts have applied the law divergently and with different rationales.").

[52] 244 U.S. 205 (1917).

[53] Swanson, *Federalism*, *supra* note 34, at 382 (describing *Jensen* as the Supreme Court's "strongest endorsement of uniformity").

[54] 244 U.S. at 216.

[55] *Id.* at 210.

[56] *Id.*; Another case often analyzed alongside *Jensen* is *Knickerbocker Ice Co. v. Steward*, 253 U.S. 149 (1920). Swanson, *Federalism, supra* note 34, at 384. In *Knickerbocker* the Supreme Court struck down an attempt by Congress to explicitly allow state workmens' compensation statutes. *Id.* Many scholars have criticized the results of these decisions, but not necessarily the Court's reasoning for adherence to uniformity. *Id.* at 384-85.

Subsequent Supreme Court cases proved that there is room, possibly a substantial amount, for state remedies despite the presence of substantive general maritime law. In *Just v. Chambers*,[57] the Court declared that states have broad authority to create rights and liability within their borders, so long as the state action "does not run counter to federal laws or the essential features of an exclusive federal jurisdiction."[58] Then, in *Romero v. International Terminal Operating Co.*,[59] the Court held that while state law must cease when it encounters the needs of a uniform system, the states are still left "a wide scope."[60] The Court observed that the federal government has left the states much regulatory power in the area of maritime torts.[61]

D. Askew

The most important Supreme Court decision as to federal preemption of state oil pollution law is *Askew v. American Waterways Operators*.[62] In *Askew*, the Court analyzed whether the Florida Oil Spill Prevention and Pollution Control Act (Florida Act)[63] could withstand a facial challenge in light of Congress's Water Quality Improvement Act of 1970 (Federal Act).[64] The Court stated that the Florida Act at issue would be upheld so long as it was not preempted or in "fatal conflict" with a federal statute, and if a state "constitutionally may exercise its police power respecting maritime activities concurrently with the Federal Government."[65]

The Court first compared and contrasted the two statutes at issue.[66] The Florida Act imposed strict liability for any oil spill cleanup costs incurred by the state or private persons if they were caused by offshore facilities or vessels in the oil industry.[67] The Florida Act placed no limit on the amount of liability that a party could incur.[68] The Florida Act also required that the owners or operators of such facilities establish evidence of financial responsibility and provided that the state Department of Natural Resources could regulate certain equipment on ships and terminal facilities.[69]

The Federal Act concerned the liability that could be incurred by ship owners and terminal facilities for cleanup costs incurred by the federal government.[70] The damages recoverable under

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[57] Just v. Chambers, 312 U.S. 668 (1941) (upholding a Florida cause of action despite a federal provision for limitation of liability).
[58] 312 U.S. at 693.
[59] 358 U.S. 354 (1959).
[60] *Id.* at 373.
[61] *Id.*
[62] 411 U.S. 325 (1973); *See also* Swanson, *Federalism*, *supra* note 34, at 389 (describing *Askew* as the "seminal case relating to maritime preemption of state water pollution control laws").
[63] 411 U.S. at 327 (*citing* FLA. STAT. § 376.011).
[64] *Id.* at 328 (*citing* 33 U.S.C. § 1161).
[65] *Id.* at 327.
[66] *Id.* at 327-38.
[67] *Id.* at 327 (*citing* FLA. STAT. § 376). Specifically, liability was imposed on any waterfront oil drilling facility, terminal facilities which handle oil, and any ships heading towards or departing from such facility.
[68] *Id.* (*citing* FLA. STAT. § 376).
[69] *Id* at 327-28.
[70] *Id.* at 328 (*citing* 33 U.S.C. § 1161).

the Federal Act did not include those incurred by private parties.[71] The amount of liability that a party could incur was capped at a specified limit.[72] The limit on liability was lifted when a spill was caused by willful negligence or willful misconduct.[73] The Federal Act's savings clause stated, in part:

> (1) Nothing in this section shall affect or modify in any way the obligations of any owner or operator of any [vessel or facility] ... to any person or agency under any provision of law for damages to any publicly-owned or privately-owned property resulting from a discharge of any oil or from the removal of any such oil.
> (2) Nothing in this section shall be construed as preempting any State ... from imposing any requirement or liability with respect to the discharge of oil into any waters within such State.
> (3) Nothing in this section shall be construed ... to affect any State ... in conflict with this section.[74]

Despite describing the Federal Act as a "pervasive system of federal control over discharges of oil ... onto navigable waters of the [U.S. and its shorelines]," the Court held that the Florida Act was not preempted by the Federal Act.[75] The Court cited the Federal Act's Conference Report, which observed that a state would be free to provide penalties and requirements similar to or in addition to those imposed in this section of the statute.[76] The Report stated that "[t]hese [penalties and requirements] ... would be separate and independent" from those in the Federal Act and enforced by states through their courts.[77]

Regarding the respective governments' entitlement to cleanup costs, the Court maintained that no conflict existed, since the Florida Act dealt with state cleanup costs and the Federal Act dealt with federal cleanup costs.[78] The Court described these provisions as "harmonious parts of an integrated whole," noting that the Federal Act directs the President to prepare a National Contingency Plan for the containment, dispersal, and removal of oil.[79] Additionally, the Court reasoned that the Federal Act's savings clause clearly anticipated federal and state cooperation.[80] The Court noted that while Congress was concerned only with federal cleanup costs, they permitted states to establish "any requirement or liability" in regards to oil spills.[81] The Court stated that this permitted Florida to enact remedies for both state and private interests, and

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[71] *Id.*
[72] *Id.* at 330.
[73] *Id.*
[74] *Id.* at 329.
[75] *Id.* at 329-37.
[76] *Id.*
[77] *Id.*
[78] *Id.* at 331.
[79] *Id.*
[80] *Id.*
[81] *Id.*

observed the obvious state concerns of protecting public beaches and the livelihood of commercial fishermen.[82]

The Court did not reach the issue of whether state removal costs could exceed those specified in the Federal Act.[83] The Court also held that it could not assess potential preemption issues as to rules concerning containment gear until they were actually promulgated.[84] Additionally, the Court left open the question of whether the Federal Act preempted the Limitation of Liability Act,[85] which provides that a vessel owner's liability shall not exceed the value of the vessel after the incident.[86]

After concluding that there was no serious conflict between the state and federal statutes the Court gave particular notice to the fact that these tort cases had traditionally been within the state's police power.[87] In 1948, however, Congress had enacted the Admiralty Extension Act[88] extending the boundaries of maritime law to damages incurred on shore.[89] The Court noted that subsequent to the Admiralty Extension Act it had even upheld state legislation regulating air pollution from ships under state police power, noting the police power could protect maritime activities concurrent with the federal government.[90] Therefore, the Court reasoned, the states' traditional police power over "sea-to-shore pollution" was not silently taken away by the Admiralty Extension Act.[91]

The Court stated that the Federal Act's waiver of preemption was valid unless *Jensen* made it so that any state law arising in admiralty jurisdiction was automatically preempted.[92] The Court stated affirmatively that *Jensen* was confined to suits involving the relationship of vessels on the high seas and navigable waters, and their crews;[93] and that the Admiralty Extension Act did not automatically preempt state laws.[94]

After *Askew*, courts had difficulty applying the opinion to their own state laws.[95] In addition to state law and general maritime law, courts also had to deal with an array of federal statutes other than the Water Quality Act at issue in *Askew*.[96] And while the *Askew* decision has been neither

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[82] *Id.* at 333-34.
[83] *Id.* at 336.
[84] *Id.* at 336-37.
[85] *Id.* at 332 (referencing 46 U.S.C. § 30505).
[86] 46 U.S.C. § 30505.
[87] 411 U.S. at 337.
[88] *Id.* at 340 (*citing* 46 U.S.C. §740).
[89] *Id.* at 340 n. 10 (*quoting* § 740 of the Admiralty Extension Act).
[90] *Id.* at 343.
[91] *Id.*
[92] *Id.* at 344.
[93] *Id.*
[94] *Id.*
[95] *See, e.g.*, Commw. of Puerto Rico v. SS Zoe Colocotroni, 628 F.2d 652 (1st Cir. 1980) (allowing state pollution law to apply to shore damages); Mobil Oil Corp. v. Town of Huntington, 380 N.Y.S.2d 466 (N.Y. Sup. Ct. 1975) (interpreting *Askew* more expansively than the court did in *Commonwealth of Puerto Rico*).
[96] *See* Steven R. Swanson, *The Oil Pollution Act of 1990 After Ten Years*, 32 J. MAR. L. & COM. 135, 136 (2001) (listing the federal statutes affecting oil spill liability before OPA to include the Clean Water Act, the Outer Continental Shelf Lands Act, the Trans-Alaska Pipeline Authorization Act, and the Limitation on Liability Act).

overruled nor broadened by subsequent decisions,[97] the laws affecting oil spill liability would once again be altered, and its scope greatly expanded, nearly two decades later.

III. Congress' Response: The Oil Pollution Act of 1990

A. *The Basics of OPA*

In 1989 the *Exxon Valdez* oil tanker ran aground the Bligh Reef, spilling more than 11 million gallons of crude oil into Alaska's pristine Prince William Sound.[98] At that time, the spill was the largest ever in U.S. waters.[99] The spill brought public attention to the devastating effects an oil spill is capable of inflicting on both the environment and the economy.[100] In the fifteen years prior Congress had been divided on how to reform oil spill legislation.[101] However, when the cleanup response proved inadequate Congress enacted the Oil Pollution Act of 1990 (OPA)[102] within the following year.[103] OPA was designed to improve prospective oil spill cleanup and provide substantial liabilities for the industry in the case of another accident.[104]

OPA provides that the party responsible for a spill resulting from an offshore facility will be liable for all removal costs plus up to $75 million in damages[105] and requires evidence of financial responsibility up to that limit.[106] The $75 million limit will be lifted, however, if it can be shown that the responsible party proximately caused the incident through gross negligence, willful misconduct, or through a violation of federal safety, construction, or operating regulations.[107] As

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[97] *See*, Swanson, *Federalism*, *supra* note 34, at 393 (asserting that "[n]o Supreme Court decision since *Askew* has broadened its holding").

[98] *Exxon Valdez*, EPA.GOV, http://www.epa.gov/oem/content/learning/exxon.htm.

[99] *The Exxon Valdez Oil Spill: A Report to the President (Executive Summary)*, EPA. GOV, http://www.epa.gov/history/topics/valdez/04.htm.

[100] Swanson, *Federalism*, *supra* note 34, at 379; *See also* Melanie Dorsett, *Exxon Valdez Oil Spill Continued Effects on the Alaskan Economy,* COLONIAL ACADEMIC ALLIANCE UNDERGRADUATE RESEARCH JOURNAL (Oct. 2010), http://digitalarchive.gsu.edu/cgi/viewcontent.cgi?article=1020&context=caaurj (estimating that commercial fishermen lost $136.5 million in the first year alone and that in the direct aftermath of the spill 250,000 sea birds died, as well as 22 killer whales, 2,800 sea otters and 300 harbor seals).

[101] Swanson, *Ten Years, supra* note 96, at 136.

[102] Oil Pollution Act of 1990, 33 U.S.C. § 2701.

[103] Swanson, *Ten Years*, *supra* note 96 at 136-37.

[104] *Id.* at 137.

[105] 33 U.S.C. § 2704(a)(3).

[106] *Id.* § 2716(a).

[107] *Id.* § 2704(c)(1)(A)-(B).

mentioned previously, BP has been designated as a "responsible party"[108] and the cap on damages will likely be lifted.[109] OPA includes several affirmative defenses which are not at issue here.[110]

Particularly important as to the issue of preemption is OPA's savings clause, which is titled "Relationship to other law."[111] One of its subsections, titled "Preservation of State Authorities; Solid Waste Disposal Act" provides that "[n]othing" in OPA nor the Limitation of Liability Act shall:

> (1) Affect, or be construed or interpreted as preempting, the authority of any State ... from imposing any additional liability or requirements with respect to:
> (A) The discharge of oil or other pollution by oil within such state; or
> (B) Any removal activities in connection with such a discharge; or
> (2) Affect, or be construed or interpreted to affect or modify in any way the obligations or liabilities of any person under ... State law, including common law.[112]

Additionally, the subsection titled "Additional requirements and liabilities; penalties" states that "nothing" in OPA nor the Limitation of Liability Act affects any State from "impos[ing] additional liability."[113]

Section 2702 of OPA covers the liability of a responsible party as to removal costs and damages.[114] Non-private claimants, such as trustees for both the federal and state governments can recover for injury to natural resources.[115] These entities can also recover for the costs of lost tax

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[108] Sen. Sheldon Whitehouse has proposed a measure that would allow parties injured by an oil spill to recover their losses from any of the companies involved in an oil spill, not just the designated "responsible parties." *See* Katie Howell, *Offshore Drilling: Whitehouse Offers Bill to Ensure Victims Can Sue All Companies in Spills*, ENVIRONMENT & ENERGY DAILY, Sep. 29, 2010; *See also* Jesse Westbrook, *Transocean Request to Cap Liability 'Unconscionable,' U.S. Says*, BUSINESSWEEK.COM, May 30, 2010, http://www.businessweek.com/news/2010-05-30/transocean-request-to-cap-liability-unconscionable-u-s-says.html (reporting that the U.S. Coast Guard also designated Transocean as a "responsible party").

[109] *See supra* text accompanying notes 19 and 20 (evidencing gross negligence and multiple violations by BP); *See also* David Hammer, *BP Acknowledges It Never Followed Blowout Preventer Law, Blames MMS*, TIMES-PICAYUNE, June 17, 2010, http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/06/bp_acknowledges_it_never_follo.html (reporting that BP did not follow a federal law "requiring it to certify that a blowout preventer device would be able to block a well in case of an emergency"). BP, however, blames that failure on the Minerals Management Service, a federal oversight agency, for not asking it to comply with the law. *Id.*

[110] 33 U.S.C. § 2703(a)(1)-(3) (listing an act of God, an Act of war and an act or omission of a third party who is not an employee, agent, or in contractual privity with the responsible party as defenses). Therefore even if it was shown that the accident was caused entirely by another party (e.g., Haliburton or Transocean) BP could still be sued due to their contractual privity and would then have to sue that party for contribution. *Id.* § 2709.

[111] *Id.* § 2718.

[112] *Id.* § 2718(a).

[113] *Id.* § 2718(c).

[114] *Id.* § 2702.

[115] *Id.* § 2702(b)(2)(A).

revenue and increased public services used in the removal process.[116] The loss of subsistence use of natural resources is recoverable by any claimant regardless of ownership.[117]

Relevant to the issue of recovering purely economic losses are the remaining two subsections of § 2702. Subsection B, titled "Real or personal property," states that "[d]amages for injury to, or economic losses resulting from destruction of, real or personal property" are recoverable by "a claimant who owns or leases that property."[118] Subsection E, titled "Profits and earning capacity" states that "[d]amages equal to the loss of profits or impairment of earning capacity due to the injury, destruction, or loss of real property, personal property, or natural resources" are recoverable by "any claimant."[119]

B. Courts' Interpretations of OPA and Purely Economic Losses

Before assessing which, if any, state laws are permissible in light of OPA, it will be helpful to first understand how OPA might alter the longstanding *Robins Dry Dock* rule from general maritime law. As opposed to the other states abutting the Gulf of Mexico, Florida has statutorily prohibited offshore oil drilling in state territorial waters.[120] The result has been a lack of precedent in Florida regarding how subsections B and E affect state law. Therefore, Florida courts may look at how other jurisdictions have interpreted OPA's damages provisions. Unfortunately, no consistent interpretation has emerged.

The first case to interpret subsection E did so narrowly. In *Cleveland Tankers, Inc.*,[121] plaintiffs sought recovery for lost profits after an oil spill closed the channel along which their businesses were located.[122] The U.S. District Court for the Middle District of Michigan dismissed the claims stating that the plaintiffs had not alleged any injury, destruction, or loss to "their property" under

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[116] *Id.* §§ 2702(b)(2)(D), (F).
[117] *Id.* § 2702(b)(2)(C).
[118] *Id.* § 2702 (b)(2)(B).
[119] *Id.* § 2702(b)(2)(E).
[120] FLA. STAT. 377.242(5) (stating that "no structure intended for the drilling for, or production of, oil, gas, or other petroleum products may be permitted or constructed north of 26°00′00″ north latitude off Florida's west coast to the western boundary of the state bordering Alabama as set forth in s. 1, Art. II of the State Constitution, or located north of 27°00′00″ north latitude off Florida's east coast to the northern boundary of the state bordering Georgia as set forth in s. 1, Art. II of the State Constitution, within the boundaries of Florida's territorial seas as defined in 43 U.S.C. s. 1301"); *See also Active Leases and Infrastructure,* BOEMRE, http://www.gomr.boemre.gov/homepg/lsesale/visual1.pdf (last visited Nov. 18, 2010) (showing an abundance of oil and gas structures near all of the Gulf states except Florida). One year prior to the Deepwater Horizon spill the Florida House of Representatives passed a bill that would allow offshore drilling in state waters but it died in the Senate. *See* Florida House of Representatives, *HB 1219 - Regulation of State Lands and Oil and Gas Resources*, *available at* http://www.myfloridahouse.gov/Sections/Bills/billsdetail.aspx?BillId=41518. Shortly after the spill began Florida Governor Charlie Crist initiated a proposal to ban offshore drilling by amending the state constitution but the measure was rejected. *See* Steve Bousquet, et al, *Florida Legislature Adjourns, Rejecting Vote on Constitutional Amendment Banning Oil Drilling,* ST. PETERSBURG TIMES, July 20, 2010, http://www.tampabay.com/news/business/energy/article1109979.ece.
[121] Petition of Cleveland Tankers, Inc., 791 F. Supp. 669 (E.D. Mich. 1992).
[122] *Id.* at 670.

subsection E.[123] In other words, the court held that subsection E codifies the *Robins Dry Dock* rule.[124]

The U.S. District Court for the Eastern District of Louisiana also interpreted subsection E as requiring damage to a proprietary interest before recovery for lost profits were permitted.[125] In *Sekco Energy*, the owner of a drilling platform brought suit for economic losses against an individual whose vessel towed a seismic cable into the leg of the drilling platform.[126] Oil subsequently spilled, leading to a temporary ban on offshore drilling.[127] Both parties agreed that the owner suffered economic losses and that the losses were not a result of the physical damage to the drilling platform.[128] After the court held that the plaintiff's claim must be dismissed under subsection B since there was no destruction to real or personal property, the court refused to dismiss the claim under subsection E.[129] The court stated that the plaintiff's property interest in drilling on the outer continental shelf was the type of property contemplated by subsection E.[130]

In contrast, the U.S. Court of Appeals for the First Circuit interpreted subsection E more broadly.[131] In *Ballard Shipping Co. v. Beach Shellfish*, an oil tanker ran aground and spilled 300,000 gallons of oil into a Rhode Island bay.[132] The court considered whether general maritime law preempted a state statute providing for purely economic losses.[133] Although OPA did not apply to the spill because it occurred prior to OPA's enactment,[134] the court looked to subsections B and E to inform its decision.[135] The court stated that if "the 'natural resources' injury provision in subsection E were limited to those owned by a claimant 'who owns or leases that property' then subsection E would be redundant in light of subsection B."[136] Therefore, the court reasoned, Congress intended to allow a claimant who does not own any damaged property to recover for purely economic losses stemming from an injury to natural resources.[137] While the First Circuit's commentary was dicta, other courts have cited *Ballard*'s interpretation of subsection E with approval.[138] The Fifth Circuit, for example, held that subsection E allows a claimant to "recover for

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[123] *Id.* at 678-79.

[124] *But see* Swanson, *Ten Years, supra* note 96, at 155 (arguing that *Cleveland Tanker* seems to be "out of step" and that "most decisions relating to economic loss have liberally allowed recovery under the Act.").

[125] *See* Sekco Energy, Inc. v. M/V Margaret Chouest, 820 F.Supp. 1008, 1015 (E.D. La. 1993).

[126] *Id.* at 1010.

[127] *Id.*

[128] *Id.*

[129] *Id.*

[130] *Id.* This case exemplifies the difficulties facing a Deepwater Horizon spill claimant, because even though the court allowed the claim under subsection E, the plaintiff still eventually lost when he was unable to establish proximate cause. *See* Swanson, *Ten Years, supra* note 96.

[131] Ballard Shipping Co. v. Beach Shellfish, 32 F.3d 623 (1st Cir. 1994) (interpreting subsection E as providing for purely economic losses).

[132] *Id.* at 624.

[133] *Id.* at 625.

[134] *Id.* at 630-31.

[135] *Id.*

[136] *Id.* at 631.

[137] *Id.*

[138] *See, e.g.,* In re Taira Lynn Marine Ltd. No. 5, LLC, 444 F.3d 371, 382 (5th Cir. 2006) (citing *Ballard* favorably in its interpretation of subsection E).

economic losses resulting from damage to another's property" so long as the claimant can show that there was physical damage to *someone's* property.[139]

C. *Purely Economic Losses Should be Recoverable Under OPA*

As the case law to date has shown, there is no consensus among the courts on whether subsections B and E alter the *Robins Dry Dock* rule. The statute's language is not a model of clarity.[140] OPA does not define the terms "destruction," "injury," or "loss."[141] Since these words are not defined it is hard to know what exactly must occur in order to trigger a particular subsection.[142] One possible interpretation is that that subsection B codifies the *Robins Dry Dock* rule, since that subsection requires "destruction," rather than the less demanding terms "injury" or "loss."[143] Subsection B also appears to imply a concern for those whose property is actually contacted by oil because it only provides a remedy to those who own or lease the property that is destroyed.[144] As to subsection E, it might codify the exception to the *Robins Dry Dock* rule and thus allow purely economic losses for commercial fishermen only.[145] On the other hand, it may be that subsection E itself codifies the *Robins Dry Dock* rule as held in *Cleveland Tankers, Inc.* and *Sekco Energy*.

OPA's legislative history seems to slightly favor the interpretation that OPA codifies the *Robins Dry Dock* rule. In a Conference Report, Rep. Jones of North Carolina stated that the "polluter should pay and the victim should receive full compensation for direct, proven [economic] damages ... to third parties such as fishermen and beachfront property owners who ... meet requirements for standing."[146] Rep. Jones's reference to "direct" damages for two classes of individuals that are likely to suffer physical contact with oil may simply codify the general maritime approach. Another Conference Report, while noting that a claimant need not be the owner of damaged property or resources to recover lost profits, cites the example of commercial fishermen.[147]

Despite the difficulty courts have had in interpreting OPA, its plain language indicates that purely economic losses are recoverable. Subsection B provides recovery for an owner or lessee of damaged property.[148] Conversely, subsection E provides that "any party" can recover for lost profits due to damage to property or natural resources.[149] This distinction between owner/lessee and "any party" shows that an individual should be able to recover for lost profits despite it not being his

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[139] *Id.* at 382-83.

[140] *See* Wagner, *supra* note 46, at 297 (describing the language of OPA as "imprecise[e] and "ambigu[ous]" and noting that "[w]ith typical indifference, Congress declined to define several key terms").

[141] 33 U.S.C. § 2701.

[142] *See* Wagner, *supra* note 46, at 297 (stating that "[w]hile statutory definitions of such common terms is ordinarily unnecessary, clarity becomes critical" because both subsection B and E provide for "economic loss").

[143] 33 U.S.C. § 2702(b)(2)(b).

[144] *Id.*

[145] Christie & Hildreth, *supra* note 47 (stating that subsection E "apparently codifies the exception in maritime law ... that allows damages for economic losses for commercial fishermen.").

[146] *See* H.R. Conf. Rep. No. 136, 101st Cong., 2d Sess. H6933-02 (1990).

[147] *See* H.R. Conf. Rep. No. 653, 101st Cong., 2d Sess. 103 (1990). This may be a reaffirmation of the *Robins Dry Dock* rule's exception for commercial fishermen.

[148] 33 U.S.C. § 2702 (b)(2)(B).

[149] *Id.* § 2702 (b)(2)(E).

own property that was damaged. This interpretation is also logical because subsection E's title suggests a concern with the impairment of "[p]rofits and earning capacity" rather than tangible property.[150] Since subsection B provides for the recovery of "economic losses" for those who own or lease destroyed property, it seems that all that is left for subsection E's "economic losses" to cover is instances in which property has not been physically contacted.[151] Some scholars have concluded that subsection E effectively removes the *Robins Dry Dock* rule.[152] One could argue that subsection E does in fact require actual damage to *someone's* property before a non-owner can make a claim. But this is not a major issue since subsection E can be triggered by damage to natural resources and major oil spills commonly cause widespread damage to the environment.[153]

There is some legislative history apparently supporting a broad interpretation of subsection E. Rep. Schneider of Rhode Island seemed to interpret OPA's coverage to apply to parties who would have no remedy in general maritime law.[154] Rep. Schneider observed that OPA would require compensation for losses suffered by a more distant set of parties, including fish dealers, fish processors, and bait and tackle store owners.[155] Legislative commentary from the proposed act preceding OPA includes commentary from Rep. Fields of Texas, who stated that H.R. 1465 would provide compensation for injured parties such as a hotel owner.[156] While neither one of these statements is overwhelming, it is possible that they refer to parties who would not own or lease any property physically touched by oil.

The most obvious problem with interpreting OPA to provide for purely economic losses is that it provides no guidance to courts on how far to extend liability. [157] For example, it is not clear who can recover economic losses stemming from damage to natural resources under subsection E. OPA also does not shed light on how individuals are to prove that the oil spill actually caused their economic losses.[158] This is unfortunate because it means that courts will have to derive an arbitrary test, perhaps resorting to tort's highly indeterminate proximate causation analysis, to determine who can recover purely economic losses from subsection E. Regardless, the way in which a court interprets subsection E may not be quite as important in light of OPA's savings clause.

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[150] *Id.*

[151] *Id.* § 2702 (b)(2)(B).

[152] Wagner, *supra* note 46, at 296 (noting that "several commentators have concluded that OPA eliminates any application of the [*Robins Dry Dock* rule], and that even remote claimants indirectly impacted by an oil spill may recover purely economic losses"); *See also* Christie & Hildreth, *supra* note 47, at 304 (quoting authors who were counsel with the House Merchant Marine and Fisheries Committee at the time of OPA's enactment for the notion that OPA "deletes a limitation ... requiring that the claimant show physical damage to a proprietary interest before economic damage could be awarded.").

[153] 33 U.S.C. § 2702(b)(2)(E) (allowing recovery for damage to natural resources).

[154] *See* Material in Extension of Remarks No. 136, 101st Congress, 2d Sess. E2109-01 (1990).

[155] *Id.*

[156] *See* Congressional Record No. 135, 101st Cong., 2d Sess. H8120-03 (1990).

[157] Thomas Wagner stated that Congress's failure to "define and delimit these new remedies with precision" means that the "public and the courts [must] undertake the difficult, expensive, and time-consuming task of divining Congressional intent." Wagner, *supra* note 46, at 300.

[158] *See also* Harvard Law Review Association, *The Requirement of Certainty in the Proof of Lost Profits,* 64 HARV. L. REV. 317, 325 (1950) (observing that as a general matter the "multiplicity of factors involve[d] ... make it impossible to forecast with precision how much certainty [is] required" in proving lost profits).

D. OPA's Savings Clause Allows for State Oil Spill Liability

A court's interpretation of a statute begins with its text,[159] and it is hard to imagine how the text of OPA's savings clause could be more clear.[160] In total, Congress spoke out against preemption three different times, stating that "nothing" in OPA: preempts a state from imposing additional liability; modifies the liability of a person under state law; or affects a state from imposing additional liability.[161] Similarly, in *Askew* the Court cited three provisions opposing preemption in allowing the Florida Act to stand.[162] While *Askew* did not answer the question of whether the Limitation of Liability Act preempts state law,[163] OPA clearly states that it does not.[164] *Askew* also did not answer the question of whether state removal costs could exceed federal removal costs.[165] But while the Federal Act in *Askew* did not explicitly allow for "additional" state costs,[166] OPA states that "additional" state liability can be imposed.[167]

The structure of OPA further indicates that states should be permitted to provide remedies for oil spill damages as they please. In *U.S. v. Locke*,[168] the Supreme Court stated that the location of OPA's savings clause within the statute provides context for its interpretation.[169] OPA contains nine titles, with the first one labeled "Oil Pollution Liability and Compensation."[170] It is within Title I that OPA's savings clause can be found.[171] "Congress," the Court reasoned, "intended to preserve state laws of a scope similar to the matters contained in Title I."[172] The Court reasoned that Congress's placement of the savings clause in Title I evidenced an intent to preserve state liability laws, rather than state requirements for vessel design and operation.[173]

OPA's legislative history also indicates that Congress did not intend for OPA to preempt state law in certain areas. In the years prior to OPA's enactment the Senate and House heavily debated whether federal oil spill law should preempt state laws.[174] Certain members of the Senate believed that federal legislation should set a minimum level of liability and permit states to provide a more

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[159] Desert Palace, Inc. v. Costa, 539 U.S. 90, 98 (2003) (stating that "precedents make clear that the starting point for [a court's] analysis is the statutory text.").
[160] *See* James Garner, *The Oil Pollution Act of 1990: Interplay with State and General Maritime Law*, GLGGROUP, July 9, 2010, http://www.glgroup.com/News/The-Oil-Pollution-Act-of-1990--Interplay-with-State-and-General-Maritime-Law-49419.html (stating that "at the very least OPA is not intended to preempt state law imposing or regulating liability for oil releases that cause damage to states and their citizens.").
[161] 33 U.S.C. §§ 2718 (a), (c).
[162] Askew v. American Waterways Operators, Inc., 411 U.S. 325, 329 (1973).
[163] *Id.* at 332.
[164] 33 U.S.C. §§ 2718(a), (c).
[165] 411 U.S. at 332.
[166] *Id.* at 329.
[167] 33 U.S.C. §§ 2718(a), (c).
[168] U.S. v. Locke, 529 U.S. 89 (2000) (holding that state tanker regulations are preempted by OPA).
[169] *Id.* at 105.
[170] *Id.* at 101.
[171] *Id.* at 105.
[172] *Id.*
[173] *Id.*
[174] Michael P. Donaldson, *The Texas Response to Oil Pollution: Which Law to Apply*, *25* ST. MARY'S L.J. 533, 559 (1994) (detailing the preemption debate in Congress).

stringent standard.[175] But proponents of preemption in the House believed that a unified, comprehensive approach would provide the best system for cleaning up oil spills and providing compensation.[176] Those who favored preemption sought to ratify an international agreement known as the 1984 Protocols.[177] If adopted, the 1984 Protocols would have provided specific liability standards that preempted any other federal or state schemes going further than the international scheme.[178] Congress ultimately rejected the international liability scheme in favor of OPA.[179] Scholars have also interpreted the enactment of OPA as evidence that opponents of preemption won out.[180]

In sum, it appears that OPA allows states to provide remedies for purely economic losses in addition to the purely economic losses recoverable under subsection E of OPA. While that may seem redundant, the distinction between purely economic losses under each law is important since not all states provide in tort for purely economic losses. For affected individuals in these states they must look solely to OPA for recovery if no oil touched their property. However some states, such as Rhode Island, explicitly provide for purely economic losses by statute.[181] Florida may also allow recovery for purely economic losses.[182] If the test for how far liability extends under both subsection E and a particular state remedy are identical then this discussion becomes a moot point. On the other hand, because the existence of a state remedy may provide a court with more guidance in determining purely economic losses than OPA does,[183] the state remedy may be easier to prove depending on how a court analyzes subsection E.

While OPA's impact on state law has been discussed, one might wonder if general maritime law still lingers in the background. As compensation for persons injured by an oil spill, OPA displaces general maritime law.[184] A court is to apply general maritime law only in the absence of a "relevant federal statute."[185] Since OPA provides a "comprehensive scheme for the … compensation of those injured by oil spills, the general maritime law does not apply to recovery of [those] types of damages."[186] The Supreme Court has stated that OPA's savings clause is intended

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[175] *Id.*
[176] *Id.*
[177] George J. Mitchell, *Preservation of State and Federal Authority under the Oil Pollution Act of 1990*, 21 ENVTL. L. 237, 239 (1991) (discussing the preemption dispute in Congress).
[178] *Id.* at 240.
[179] Christie & Hildreth, *supra* note 47, at 17.
[180] *See, e.g.* Donaldson, *supra* note 174, at 565; Mitchell, *supra* note 177, at 247.
[181] *See supra* note 138 (referencing Rhode Island's statute in *Ballard*).
[182] *See infra* text accompanying notes 193-223.
[183] For example, a judicially developed state common law remedy may provide important factors for courts to analyze; a state statute may provide courts with guidance in how to determine whether purely economic losses occurred or provide considerations to be given through jury instructions. A court may also limit purely economic losses under subsection E to commercial fishermen only, in which case a court's interpretation of a state remedy is vital to any non-commercial fishermen.
[184] *See also* Garner, *supra* note 160 (stating that "OPA … preempted general maritime law" through its damages provisions).
[185] Nat'l Shipping Co. of Saudi Arabia v. Moran Mid-Atlantic Corp., 924 F. Supp. 1436, 1447 (E.D. Va. 1996).
[186] *Id.* at 1447.

to preserve state laws concerning liability.[187] Therefore, any interpretation that would result in a state law being permitted under OPA yet preempted by general maritime law would defy Congressional intent.[188]

IV. *Mosaic* And its Applicability Within the OPA Regime

A. Curd v. Mosaic Fertilizer

Just two months after the Deepwater Horizon exploded and as oil continued to billow into the Gulf of Mexico, the Florida Supreme Court decided *Curd v. Mosaic Fertilizer*.[189] In *Mosaic*, a state agency warned a fertilizer storage company that their pond dike was narrower than required, resulting in wastewater being dangerously close to exceeding the safe storage level.[190] The dike broke, spilling pollutants into the Tampa Bay.[191] Several local commercial fishermen claimed that the spilled pollutants caused the loss of underwater plant and marine life.[192] At no point did the fishermen claim to have an ownership in the damaged plant or marine life.[193] The fishermen sought recovery for lost profits, which they claimed resulted from damage to the reputations of the fishery-related products they could otherwise catch and sell.[194] The fishermen brought claims under common law theories of negligence and strict liability, as well as recovery under Florida's Pollutant Discharge Prevention and Control Act,[195] specifically FLA. STAT. § 376.313(3) (herein "section 313").[196] After being denied recovery at both the trial and appellate level, the commercial fishermen were granted *certiorari* by the Florida Supreme Court.[197]

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[187] U.S. v. Locke, 529 U.S. 89, 105 (2000).

[188] *See also* 2 ADMIRALTY & MAR. LAW § 18-2 (4th Ed.) (2010) (observing that "OPA probably preempts maritime tort liability not only for ship owners and operators, but also for third parties.").

[189] 39 So.2d 1216 (Fla. 2010).

[190] *Id.* at 1218.

[191] *Id.*

[192] *Id.*

[193] *Id.* at 1218-19.

[194] *Id.* at 1219.

[195] FLA. STAT. 376.011. Interestingly, this is the same Florida Act that was at issue in *Askew*, although it has been modified since *Askew* was decided. While the Florida Act in *Askew* did not limit state cleanup costs, the updated Florida Act does. *See* FLA. STAT. § 376.012(2) (limiting cleanup costs for a vessel of 3,000 tons transporting pollutants, for example, to the greater of $12 million or $1,200 per gross ton). However that cap will be lifted if gross negligence can be shown. *Id.* § 376.012(3). This distinction may not be relevant for this paper because the commercial fishermen claimed economic losses stemming from natural resource damage, which is not capped. *Id.* § 376.13(5) (stating responsible party is liable to the *fund* for "all natural resource damages"). And while that provision regards damages to "the fund," the court nonetheless stated that section 376 contains a private cause of action and that a party is liable for "all damages." *Id.* § 376.313(3). Other differences are that the old Florida Act concerned only oil spills while the updated Florida Act covers all "pollutants," including "oil of any kind." *Id.* § 376.031(16).

[196] 39 So.2d at 1219 (citing FLA. STAT. § 376.313(3)).

[197] *Id.* at 1218-19.

The first question the court addressed was whether the private cause of action recognized in section 313 permits commercial fishermen to recover for economic losses despite the fact that the fishermen did not own any property damaged by the pollution.[198] Section 313 provides that:

> nothing ... prohibits any person from bringing a cause of action ... for all damages resulting from a discharge or other condition of pollution ... [Except in certain circumstances] it is not necessary for such person to plead or prove negligence in any form or manner ... [They must only prove] that the prohibited discharge or other pollutive condition ... has occurred.[199]

Although the wording of the statute seems closer to a savings clause than one creating a cause of action, the court noted that they had already interpreted this clause as creating a cause of action.[200] While the creation of a cause of action from this language has been criticized, the court's opinion is binding.[201] Although section 313 concerns individual causes of action for pollution of surface and ground waters, the court noted that section 376.205 also provides for an individual cause of action for pollution of coastal land and waters.[202] Courts have interpreted section 376.205, however, as providing a cause of action only for clean up or removal of the prohibited discharge.[203]

The statute defines damages as "the documented extent of any destruction to or loss of any real or personal property, or the documented extent ... of any destruction of the environment and natural resources [defined to include all living things except humans] ... as the *direct* result of the discharge of a pollutant."[204] The court dismissed the company's argument that economic damages were not recoverable since the commercial fishermen did not own damaged property, reasoning that the definition of "damages" included damage to natural resources.[205] The court also reasoned that "lack of property ownership" was not an available defense under the statute.[206] The court specifically emphasized that "the language of [section 313] allows *any person* to recover for damages."[207]

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[198] *Id.* at 1219-20.
[199] *Id.* at 1220.
[200] 39 So.2d at 1221-22 (referencing its finding of a cause of action in *Aramark Uniform and Career Apparel, Inc. v. Easton*, 840 S.2d 20 (Fla. 2004)).
[201] *See* Kaplan v. Peterson, 674 So.2d 201 (Fla. 5th DCA 1996) (stating that the statute is "so badly drafted that if it does intend to create a cause of action, it opens up a real can of worms in terms of who can sue, where, and for what").
[202] 39 So.2d at 1234 n.1.
[203] *See* Italiano v. Jones Chemicals, Inc., 908 F.Supp. 904, 906 (M.D. Fla. 1995) (holding that § 376.205 creates a private cause of action but that "such damages must be connected with the cleanup or removal of the prohibited discharge").
[204] 39 So.2d at 1221 (citing § 376.031(5)) (emphasis added). Some have argued that the *Mosaic* court clearly misinterpreted the statute. The definition of "damage" that the court cites explicitly applies to sections 376.011-376.21, not section 376.313. *See* Sidney F. Ansbacher et al., *Strictly Speaking, Does .FS. §376.313(3) Create a Duty to Everybody, Everywhere?*, 84 FLA. BAR J. 36 (2010) (acknowledging that despite this error, the court's "interpretation of the state statute is binding.").
[205] 39 So.2d at 1222.
[206] *Id.*
[207] *Id.* at 1221.

After holding that the fishermen could bring a cause of action under section 313, the court next addressed whether "commercial fishermen can recover for economic losses proximately caused by the negligent release of pollutants" even though they did not own any damaged property.[208] The appellate court had held that any claim under negligence was barred because the fishermen did not sustain any bodily injury or property damage but rather sought purely economic damages.[209] The Florida Supreme Court dismissed this argument, holding that this was not a situation where the economic loss rule applied.[210] In Florida the rule only arises in situations involving both contractual privity and a tort or in situations involving certain damage from product defects.[211]

Having dismissed any threshold issues barring purely economic recovery under Florida common law the court analyzed the matter under traditional negligence principles of duty, breach, proximate cause, and damage.[212] While it recognized that some courts have denied that any duty is owed to a party who suffers purely economic losses, the court reasoned that this determination ultimately turns on whether there is a "foreseeable zone of risk arising from the acts of the defendants."[213] The court held that the facility was obliged to protect those exposed to harm in the zone of risk created by the facility's activities.[214] It was foreseeable, the court reasoned, that if the facility released pollutants into this zone it would cause damage to marine and plant life, as well as human activity.[215] Additionally, the court observed that within this zone of risk the fishermen had a special interest not shared by the general community.[216] The court supported this assertion by noting that the fishermen had licenses to conduct special activities in the Tampa Bay waters and also because their ability to earn a livelihood was dependent on those waters.[217]

After finding that the facility owed a duty to the fishermen, the court found that the facility breached its duty by interfering with the fishermen's special interests by discharging pollutants into those public waters.[218] The breach of duty gave rise to a cause of action in negligence, with the only remaining requirement that the fishermen must prove causation and damages (i.e. loss of profits).[219]

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[208] *Id.* at 1222.
[209] *Id.* at 1223.
[210] *Id.*
[211] *Id.*
[212] *Id.* The court stated that the case was also controlled by "strict liability principles." However at the end of the opinion the court states narrowly that "this breach of duty has given rise to a cause of action sounding in negligence." *Id.* at 1216-28. Therefore, I will only be discussing the negligence claim.
[213] *Id.* at 1223-28.
[214] *Id.* at 1229.
[215] *Id.*
[216] *Id.*
[217] *Id.*
[218] *Id.*
[219] *Id.*

B. *Reflections on* Mosaic

While the *Mosaic* decision left many uncertainties in its wake, it does not appear that section 313 stands for the proposition that an individual can recover economic losses when there has been no physical damage at all.[220] Instead, the court made it apparent that once natural resource damage was established, commercial fishermen (and maybe others) could *then* recover consequential economic damages.[221] Importantly, a Deepwater Horizon spill claimant can easily show evidence of damage to natural resources.[222] The more important question is *who* can recover for damage to these natural resources?

The question certified to the court was whether "commercial fishermen" could recover damages for loss of income.[223] But in answering in the affirmative the court clearly emphasized that "any" person could recover for damage to natural resources.[224] The obvious question is what scope of individuals fall under the umbrella of "any?" In contrast to the court's negligence analysis, its statutory analysis provides little insight.[225] Since the definition of "damage" provides recovery for "direct" damage, *Mosaic* may imply that only those who directly use the water's resources can recover, such as restaurants that serve fresh fish and charter fishing boat operators.[226] On the other hand, the court may have intended for parties like beachfront hotels (i.e., those who indirectly use the water's resources to profit by attracting tourists) to recover.[227] Another possibility is that the court only meant "any" to include commercial fishermen just like the *Robins Dry Dock* rule's exception. The *Mosaic* decision provides no real guidance to future courts in discerning where the

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[220] The *Mosaic* court considered whether the commercial fishermen could recover for damage to natural resources before contemplating economic losses, since it was the "damage" that triggered the cause of action. *Id.* at 1221.

[221] 39 So.2d at 1218 (holding that section 313 allows commercial fishermen to recover "damages for their loss of income" despite not owning any damaged property).

[222] While "natural resources" is not defined in the statute, the term "damage," according to the court, includes any destruction to natural resources "including all living things except human beings.") FLA. STAT. § 376.031(5). Six months after the spill scientists were still finding evidence of damage. *See* Nick Valencia, *Scientists Find Damaged Marine Life Near BP Spill Site,* CNN, Nov. 6th, 2010, http://www.cnn.com/2010/US/11/06/gulf.coral.damage/index.html (reporting that scientists found "dramatic damage to deep-sea coral near the site of the Gulf oil disaster that one biologist called a shocking find" and that the damage is "widespread").

[223] *Id.* at 1216.

[224] *Id.* at 1221.

[225] *See* Ansbacher, *supra* note 204, at 13 (questioning whether under *Mosaic* "potential defendants owe so broad a duty that statutory claims for economic damages extend to … charter boat owners? Captains? Deck hands? To those whose income is dependent on a tourism industry whose reputation is affected by a discharge?").

[226] *See* Sarah Parsons, *Restaurants Set to Sue BP Over Deepwater Horizon Spill,* CHANGE.ORG, May 19, 2010, http://food.change.org/blog/view/restaurants_set_to_sue_bp_over_deepwater_horizon_spill
(reporting that "restaurants and seafood distributors in Florida, Mississippi, Alabama, and Louisiana recently filed lawsuits against BP seeking compensation.").

[227] Florida's Attorney General Bill McCollum would extend liability under *Mosaic* even further. He claimed that under state law "a Key West hotel that is losing business because of the misperception of oily water and beaches could still get damages." *Feinberg Says He's Not Trying to Restrict Payouts for Oil-Spill Claims,* M2M, July 6, 2010, http://m2m.tmcnet.com/news/2010/07/06/4887209.htm.

line between direct and indirect damage occurs under section 313. It is clear that the proximity between the act that caused the spill and its effect on natural resources was much more direct in *Mosaic* than it will be for most Florida claimants seeking damages from the Deepwater Horizon spill.[228]

The court's analysis of purely economic recovery under negligence at least provided a rule: when a tortfeasor creates a zone of risk, he owes a duty to an individual who, within that zone, has a special interest separate from the community, for any foreseeable harm that the tortfeasor may cause there.[229] Yet the court's decision also left a multitude of questions. For a company operating an offshore drilling rig, how far does their "zone of risk" extend? After all, the Deepwater Horizon was located off the coast of Louisiana, hundreds of miles from Florida's coastal waters. On the other hand, BP knew that the well potentially contained vast amounts of oil.[230] If the "special interest" requires something akin to a license of use within that established zone of risk (as the commercial fishermen in *Mosaic* had) then the number of potential claimants is very limited. That interpretation bars virtually all businesses on land whose profits were impaired by the Deepwater Horizon spill. However a "special interest" may just mean anyone whose profits are heavily reliant on the ocean since this is distinct from the general community. The most likely prong that BP will satisfy is "foreseeable harm" since it was obvious that their carelessness could lead to devastating effects. In spite of all these possibilities there is also a chance that courts will simply confine *Mosaic* to its facts. Subsequent courts may hold that since *Mosaic* did not concern an oil spill, the Deepwater Horizon claimants cannot rely on the decision.

After *Mosaic*, various commentators proclaimed the importance of this decision for individuals seeking recovery after the Deepwater Horizon spill.[231] Some attorneys stated that *Mosaic* would allow commercial fishermen to sue BP despite not owning any damaged property.[232] Others interpreted *Mosaic* more broadly to allow economic recovery for hotels, boat rental businesses, seafood restaurants, and others.[233] In addition to the shortcomings of *Mosaic* previously discussed,

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[228] *See* Michael Bradford, *Far-Flung Claimants Complicate BP Oil Spill Fund,* BUSINESSINSURANCE, Nov. 15, 2010, http://www.businessinsurance.com/article/20101114/ISSUE01/311149993 (stating that claims for the fund have been filed "from restaurants and fishing equipment companies located hundreds of miles from the coastal area where the oil washed up.").

[229] 39 So.2d at 1217.

[230] Of course that was the point of drilling the well in the first place. *See also* Jessica Vander Velde, *Test Show Oil Clouds Drifting More than 100 Miles from Deepwater Horizon Site,* ST. PETERSBURG TIMES, June 9, 2010, http://www.tampabay.com/news/environment/article1100796.ece (scientists reported that oil-related chemicals were seen 42 miles northeast of the Deepwater Horizon rig and 142 miles to the southeast, with some of the oil being founds two-thirds of a mile below the surface).

[231] *See, e.g., Florida Court Says Fishermen Can Sue Polluter; Is BP Next?*, INSURANCE JOURNAL, June 23, 2010, http://www.insurancejournal.com/news/southeast/2010/06/23/110989.htm (stating that the lawyers for the fishermen in *Mosaic* felt that case could set a precedent for economic damage lawsuits by Floridians against BP).

[232] *Id.*; *See also Florida Supreme Court Rules that Fishermen Can Sue for Economic Loss*, BANKRUPTCYLAWYERBETHESDA.COM, July 5, 2010, http://www.bankruptcylawyerbethesda.com/news/florida-supreme-court-rules-that-fishermen-can-sue-for-economic-loss (stating that " the ruling may be used as precedent for Florida fishermen to sue BP.").

[233] Richard Rusak & Keith Brais, *Florida Supreme Court Allows Commercial Fishermen to Recover Lost Profits Caused by Polluters*, MARITIMELAWBLOG.COM, Aug. 25, 2010,

many of these commentators failed to contrast the facts underlying *Mosaic* with the facts that will give rise to suits by Deepwater Horizon spill claimants.[234]

In *Mosaic*, the act that caused the spill occurred on land while the injury occurred in state territorial waters. This was not a maritime tort because a fertilizer phosphate plant is not a "traditional maritime activity" and moreover the "locality" of the wrong did not occur on the navigable waters or high seas.[235] Since the Deepwater Horizon was a maritime tort, and because OPA displaced general maritime law in this area, the permissibility of Florida's laws must be analyzed solely within OPA.

C. *Florida's Private Cause of Action for Natural Resources Damage and OPA*

As previously discussed, OPA's language, structure, and legislative history strongly oppose preemption. However there are two counterarguments that one might assert in regards to section 313.[236] First, OPA provides that certain trustees for the federal and state governments may bring an action for natural resource damages.[237] Private parties are not given this same right under OPA.[238] Federal courts have consistently held that private natural resource claims are to be brought by statutory trustees, not private citizens.[239]

Second, OPA authorizes the use of an oil pollution fund which may be used to pay for natural resource damages if the responsible party does not have sufficient funds.[240] Chapter 376's section on "Liability for damage to natural resources" notes that the state shall work with federal trustees as defined in OPA to ensure that no double recovery occurs.[241] Consequently, any money that one party recovers from the fund is money that another trustee will not be able to take advantage of. Both chapter 376 and OPA hold that a party may recover only one time for natural resource

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http://www.maritimelawblog.net/2010/08/florida-supreme-court-determin.html.

[234] *See* BANKRUPTCYLAWYERBETHESDA.COM, *supra* note 232 (discussing the importance of *Mosaic* in light of the Deepwater Horizon spill but providing no further analysis of the differences between the two situations).

[235] Even if one were to argue that the wrong occurred on navigable waters, both prongs must be met and the first one clearly is not.

[236] In addition to the two arguments for preemption presented in this section there are two more: (1) OPA was designed, in part, to establish the current federal requirements of the Federal Water Pollution Control Act (FWPCA). The *Mosaic* majority emphasized that chapter 376 should be construed to effect the purposes of the FWPCA. Therefore, one might argue that chapter 376 is intended to effectuate OPA. The purpose of OPA (in its establishment of current FWPCA requirements) would therefore not be effectuated if chapter 376 provided a remedy not found in OPA. *See* Ansbacher, *supra* note 204, at 18. (2) In *Askew,* the Court stated that one reason the Florida Act was not preempted is because the Federal Act dealt only with cleanup costs, therefore allowing the states to impose liability for damages suffered by both the State and private interests. Askew v. American Waterways Operators, Inc., 411 U.S. 325, 336 (1973). In contrast, OPA provides for a much broader range of damages. 33 U.S.C. § 2702.

[237] 33 U.S.C. § 2702(b)(1)(A).

[238] *Id.*

[239] *See* Ansbacher, *supra* note 204, at 21 (stating that [f]ederal courts have uniformly held that private natural resource claims are barred in favor of statutory trustees.").

[240] 33 U.S.C .§ 2712.

[241] FLA. STATE. § 376.121.

damage.[242] This rationale was explained by the U.S. Court of Appeals for the Ninth Circuit, which held that since the federal and state trustees had already recovered for natural resource damages, recreational fishermen could not recover for those same damages under the principle of *res judicata*.[243] The court reasoned that since the fishermen were in privity to the trustees (as members of the public) their interests were already represented.[244] The court observed that allowing the fishermen to *also* recover in their private capacity would represent an unpermitted double recovery.[245]

While these two arguments are largely unpersuasive because of OPA's language, structure, and legislative history, there is an additional reason why section 313 should not be preempted: Unlike claims by recreational fishermen, commercial fishermen like those in *Mosaic* are seeking to recover for an interest not represented by a trustee. In other words, commercial fishermen are not in privity with a trustee like recreational fishermen are. While trustees can sue for losses suffered by the public, such as the "cost of restoring, rehabilitating [or] replacing ... damaged natural resources,"[246] commercial fisherman would be suing for economic losses they suffered personally. At least one commentator has observed that "[t]he bar to private recovery of natural resource damages does not prohibit related claims for purely private economic damages."[247] In support of this rationale, the U.S. Circuit Court of Appeals for the Tenth Circuit held that *res judicata* did not prevent a "purely private" claim by an individual when the natural resource trustee had no standing to bring such a claim.[248] From this rationale it would follow that any other types of private parties that courts allow to bring suit under section 313 would not have their claims preempted, so long as those claims are based on some type of economic interest.

As if enough possibilities did not already exist, there is one more: it may be that section 313 is identical to subsection E of OPA. *Mosaic* held that section 313 allowed "any" person to recover economic losses if they could first show damage to natural resources.[249] Subsection E could be interpreted as also providing economic losses for "any" person that can first show damage to natural resources.[250] If these two provisions are identical then a court may preempt Florida's section 313 cause of action if it is deemed to be in conflict with subsection E.[251] Then again, a court may construe OPA's subsection E to provide recovery only for commercial fishermen and *Mosaic* to provide a remedy for a broader class of individuals. In that case, the remedy would not exist under federal law and thus would not be preempted. Moreover, this broader state remedy would be considered "additional" liability under OPA's savings clause.[252]

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[242] *See* § 1006(d)(3) in OPA and § 276.121(3) in the Florida Act.
[243] Alaska Sport Fishing Assn. v. Exxon, 34 F.3d 769, 772 (9th Cir. 1994).
[244] *Id.* at 772.
[245] *Id.*
[246] 33 U.S.C. § 2706(d)(1)(A).
[247] *See* Ansbacher, *supra* note 204, at 23.
[248] Satsky v. Paramount Comm's, 7 F.3d 1464 (10th Cir. 1993).
[249] Mosaic, 39 So.2d at 1221.
[250] 33 U.S.C. § 2702(b)(2)(E).
[251] In *Askew* the court upheld the Florida Act only after first concluding that there was no "fatal conflict between the statutory schemes" when compared to the Federal Act. Askew v. American Waterways Operators, Inc., 411 U.S. 325, 331 (1973).
[252] 33 U.S.C. §§ 2718 (a), (c) (allowing states to impose additional liability).

D. Florida Common Law Negligence and OPA

It also appears that OPA's savings clause, at least in certain areas, permits claims under state common law. By stating that OPA shall not "affect … or modify in any way the obligations or liability of any person under … State law, including common law,"[253] Congress clearly opposed outright federal preemption of state common law oil pollution remedies.

Besides the fact that OPA's language, structure, and legislative history oppose preemption, judicial precedent also shows that state common law claims are not preempted by OPA in regard to oil spill liability. In a case prior to OPA, a New York Appellate Court held that because the various federal pollution statutes at issue contained savings clauses for private rights under state law the plaintiffs' common law claims of nuisance were not preempted.[254] Cases after OPA have held similarly. In *Dostie Development v. Arctic Peace*,[255] the U.S. District Court for the Middle District of Florida held that negligence claims were not preempted by OPA.[256] The Middle District reasoned that OPA's savings clause permits states to enforce their common law liability, and that this principle is sound because "Congress does not view … expansion of liability to cover purely economic losses … as an excessive burden on maritime commerce."[257] The U.S. District Court for the Eastern District of Louisiana has stated that OPA does not preempt state common law claims of strict liability or negligence.[258] Moreover, the U.S. District Court for the Middle District of Maryland interpreted *Locke* as effectively foreclosing any argument that state common law claims concerning oil spill liability are preempted.[259]

However, OPA might treat state common law differently than state statutory law. It may be that states can enact statutory liability that exceeds OPA, but that state common law liability cannot. Out of the three provisions within OPA's savings clause, only one explicitly mentions state common law.[260] The other two provisions loosely say that a state is not preempted from "imposing" (which perhaps means *enacting* a statute that imposes) any "additional" liability.[261] It may be that since those two provisions do not explicitly mention common law they do not include it. The provision that mentions common law does not explicitly allow for additional liability. Instead, the common law provision merely says that OPA does not "affect" or "modify" state common law.[262] However, the Florida district court in *Dostie*, while allowing a state negligence claim, stated that the purpose of OPA's savings clause is to allow states to impose liability "above" that of OPA.[263] Of course none of this is entirely clear because if Congress only intended the

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[253] *Id.*

[254] Leo v. General Elec. Co., 145 A.D.2d 291, 295 (N.Y. App. Div. 1989) (holding that state nuisance claims were not preempted by the FWPCA or CERCLA).

[255] Dostie Development, Inc. v. Arctic Peace Shipping, Co., Ltd. Inc., 1996 WL 866119, No. 95-808-CIV-J-MMP at *3 (M.D. Fla. 1996).

[256] *Id.*

[257] *Id.*

[258] Isla Corp. v. Sundown Energy, LP, 2007 WL 1240212, No. 06-8645, at *2 (E.D. La. 2007).

[259] Williams v. Potomac Elec. Power Co., 115 F.Supp.2d 561, 563 (D.Md. 2000).

[260] 33 U.S.C. § 2718(a)(2).

[261] *Id.* §§ 2718(a)(1), (c).

[262] *Id.* § 2718(a)(2).

[263] Dostie Development, Inc., 1996 WL 866119, No. 95-808-CIV-J-MMP at *3.

provisions including "additional liability" to mean statutes they could have easily made it more explicit.

V. How to Provide Clarity

A. *Why a Divided System of Liability is Needed*

As this paper has shown there are very few certainties in the context of oil spill liability. The goal of maritime law is to provide uniformity, yet even before OPA the issue of preemption was contentious.[264] In view of OPA's broad savings clause this goal has still not been accomplished.[265] OPA has also failed to clear up whether federal law provides for purely economic losses and if states can offer similar remedies. Before OPA, general maritime law provided the predictable *Robins Dry Dock* rule for parties damaged by an oil spill. However this rule is unfair to many individuals who suffer purely economic losses and are not commercial fishermen.[266] OPA sought to provide fair compensation for injured parties, yet many courts simply interpret OPA to reaffirm *Robins Dry Dock*.[267]

Congress is the only entity with the power to establish a nationwide regime that can resolve these issues. Therefore, Congress should provide a system of oil spill liability that reasonably balances the goals of uniformity, predictability, and fairness.[268] This system should be divided into two categories: maritime torts that involve spills from offshore oil drilling, and all other maritime torts. At the outset this system would clearly displace general maritime law and preempt any state laws that provide a private remedy for an injury classified as a maritime tort.[269]

For the non-oil drilling maritime torts, the *Robins Dry Dock* rule should be codified. For maritime torts caused by an offshore oil spill the operator of the rig should be strictly liable for damages suffered by certain listed categories of claimants. (herein referred to as "*foreseeable*

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[264] *See* Lawrence I. Kiern, *Liability, Compensation, and Financial Responsibility*, 24 TUL. MAR. L.J. 481, 507 (2000) (noting that "in 1986 both the House and Senate passed similar comprehensive oil pollution bills only to have them die in conference because the conferees were unable to resolve political and philosophical differences over preemption.").

[265] *See* Swanson, *Ten Years supra* note 96, at 174 (stating that the "goals of an oil spill liability … system should be uniformity and predictability.").

[266] *See* Thompson v. United States, 266 F.2d 852, 856 (4th Cir. 1959) (holding that a yacht owner was unable to recover damage for the loss of use of a pleasure craft, but stating that "it strikes one as fundamentally unfair.").

[267] *See* Swanson, *Ten Years, supra* note 96, at 174 (stating that "OPA was meant to provide an effective system for prompt oil spill removal and fair compensation for those damages by such spills.").

[268] Fairness should be a goal not just because it is rational, but also because a fair system was intended by the Framers when they originally provided for maritime law. *See* Major B. Harding, *Judicial Decision-Making Analysis of Federalism Issues in Modern United States Supreme Court Maritime Cases*, 75 TUL. L. REV. 1517, 1529 (2001) (stating that "fairness and predictability are two primary reasons the Framers decided to place maritime matters within national control.").

[269] Since this paper has focused mainly on private recovery of economic losses and preemption, this system does not propose a solution to issues outside that scope, such as cleanup costs.

parties").[270] For *any* maritime tort, if an individual can show that oil actually injured a proprietary interest of his then he can proceed under the *Robins Dry Dock* rule. Thus the *foreseeable parties* approach applies exclusively to purely economic losses caused by an offshore oil spill.

B. Why Offshore Drilling Requires Special Treatment

It is not uncommon for society to impose a different legal standard on conduct that is considered risky.[271] For example, while an individual must act unreasonable to be found negligent,[272] an individual who engages in "abnormally dangerous" activity can be found liable regardless of whether or not they acted unreasonably.[273] The rationale for having a different legal standard for offshore drilling than for other maritime activities is the same.

As to any individual oil spill, offshore drilling accidents typically release a larger volume of oil than in other kinds of oil spills.[274] The Deepwater Horizon allowed the release of approximately 206 million gallons of oil into the Gulf: an amount that would have continued to rise had it not been capped months later.[275] In contrast, the *Exxon Valdez* tanker spilled about 11 million gallons.[276] In fact, since 1991 the "major" oil spills in the U.S. that were not the result of offshore drilling add up to less than 6% of the total released in the Deepwater Horizon spill.[277]

Riskiness in the offshore drilling industry is also a result of the fact that most "easy" targets have already been developed in the search for underwater oil.[278] This means that offshore drillers continue to explore areas that are more geologically complex, located in deeper waters, and

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[270] Similar to OPA, the operator of the rig could be designated as "responsible" and required to sue other liable parties in contribution.

[271] Restatement (Second) of Torts § 519 (stating that "one who carries on an abnormally dangerous activity is subject to liability for harm … although he has exercised the utmost care to prevent the harm.").

[272] *Id.* § 282 (defining negligence as subjecting others to "unreasonable" harm).

[273] *Id.* § 519.

[274] Andrea Thompson, *FAQ: The Science and History of Oil Spill,* LIVESCIENCE, Apr. 23, 2010, http://www.livescience.com/environment/oil-spill-faq-100423.html.

[275] Harry R. Weber, *Deepwater Horizon's Blowout Preventer Pulled from Gulf, FBI Present,* HUFFINGTONPOST, Sept. 9, 2010, http://www.huffingtonpost.com/2010/09/05/deepwater-horizons-blowou_n_705991.html.

[276] *How Much Oil Really Spilled from the Exxon Valdez,* NPR, June 18, 2010, http://www.onthemedia.org/transcripts/2010/06/18/01.

[277] *See Oil Spills and Disasters,* INFOPLEASE, http://www.infoplease.com/ipa/A0001451.html (last visited Nov. 10, 2010) (estimating that since 1991 seven different non-drilling accidents released about 12 million gallons of oil into U.S. waters). Approximately seven million of those gallons were released from pipelines, storage tanks, and industrial plants when Hurricane Katrina struck Louisiana. *Id.* But one might note that over the last 50 years tanker accidents have spilled 4 million tons of oil whereas offshore drilling has spilled 1 million. *Id.* Steven F. Hayward, *How to Think About Oil Spills,* AMERICAN ENTERPRISE INSTITUTE FOR PUBLIC POLICY RESEARCH, June 21, 2010, http://www.aei.org/article/102181. The problem is that these numbers take into account worldwide totals. Because Congress already rejected an international scheme due to worries that liability will not be stringent enough, this paper assumes a U.S.-specific approach is favored by Congress.

[278] Chris Rowan, *Drilling for Oil is More Risky than it Used to Be,* SCIENCEBLOGS, May 4, 2010, http://scienceblogs.com/highlyallochthonous/2010/05/drilling_for_oil_is_more_risky.php (describing how offshore oil drilling is getting more difficult as the more easily accessible spots are depleted).

therefore present more technological challenges than did wells in the past.[279] The increased difficulty makes it more likely that problems will arise.[280] While it is obvious that offshore drilling presents potential dangers to society not present with other non-oil related maritime activities,[281] offshore drilling rigs should also be analyzed separately from oil tankers. OPA requires that single hull oil tankers be phased out and that new oil tankers possess a double hull design.[282] The double hull design reduces the likelihood of an oil spill.[283] But while the safety of oil tankers has improved through regulation, offshore drilling rigs have continued to push the boundaries of technology.[284] The design of an oil tanker is much simpler than that of an offshore drilling rig. So while the government is capable of effectively regulating the structural integrity of oil tankers, it will be much more difficult to effectively regulate the complex, cutting edge technology needed for offshore drilling.[285] Because of this difficulty, the appropriate safeguard is enhanced liability. [286] Regarding

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[279] *Id.* The technology employed by deepwater drilling rigs is riskier than shallow water rigs because the blowout preventer on shallow water rigs is located above the water's surface, making it easier to routinely inspect. The Deepwater Horizon was, obviously, a deepwater rig, drilling in 18,000 feet of water. *See Offshore Oil Drilling in Shallow Water: Good Safety Record, Less Risky,* INSTITUTEFORENERGYRESEARCH, Oct. 21, 2010, http://www.canadafreepress.com/index.php/article/29068 (comparing deep water and shallow water drilling). But shallow water drilling is also dangerous, as evidenced by the Ixtoc blowout in 1979, the largest oil spill in the Gulf of Mexico prior to the Deepwater Horizon spill. *Id.*

[280] *Id.*

[281] Cruise ships, fishing boats, jet ski rentals, and other popular activities on the water do not present a realistic threat of billions of dollars in losses to people hundreds of miles away.

[282] 46 U.S.C. § 3703(a).

[283] OCIMF, DOUBLE HULL TANKERS- ARE THEY THE ANSWER? (2003), http://www.ceida.org/prestige/Documentacion/dobrecascopetroleiros.pdf (stating that all other factors being equal, a double hull is less likely to spill oil than a single hull tanker).

[284] Ian Urbina, *BP Is Pursuing Alaska Drilling Some Call Risky,* N.Y.TIMES, June 23, 2010, http://www.nytimes.com/2010/06/24/us/24rig.html?pagewanted=all (stating that in its promotional materials BP boasted that their Liberty project in Alaska would "push the boundaries of drilling technology."). The project included extended reach drilling, the type employed on the Deepwater Horizon. Engineers have criticized the technology, saying that it is "risky" and is "less safe than conventional types of drilling because gas kicks that can turn into blowouts are tougher to detect as they climb more slowly toward the rig." *Id.*

[285] *See* Siobhan Hughes, *Spill Panel Says Rig Culture Failed on Safety*, WALL STREET JOURNAL, Nov. 10, 2010, http://online.wsj.com/article/SB10001424052748704635704575604622510434324.html (quoting Exxon Mobil's CEO, who said that "it would be tough for regulatory agencies to hire people skilled enough in the complex technology of deepwater drilling to oversee such operations effectively."). The CEO also stated that his industry hires the "best and brightest people" and pays them accordingly, and it would be tough for a regulatory agency to "have people at the same level of competency." *Id.*

[286] Of course an alternative would be to ban offshore drilling completely. This paper assumes that offshore drilling is a socially desirable activity due to the United States' reliance on oil. President Obama has stated a goal to eventually phase out U.S. reliance on foreign oil and convert to clean energy. However these plans call for a very gradual shift over the coming decades, not an abrupt end to oil production. Karina Rusk, *Obama Pledges to End Oil Dependency,* ABCLOCAL.COM, Aug. 29, 2009, http://abclocal.go.com/kgo/story?section=news/politics&id=6359976.

foreign oil tankers, Congress has already addressed these vessels by applying more stringent regulations than is applicable to those flying a U.S. flag.[287]

C. *The "Foreseeable Parties" Approach*

While the divided system should provide the bright line *Robins Dry Dock* rule for non-drilling maritime torts,[288] offshore drilling should be subject to the more flexible *foreseeable parties* approach. The goal of the *foreseeable parties* approach is to provide more guidance than remedies like subsection E of OPA, yet still be flexible enough to provide a fair remedy to certain parties who suffer purely economic losses. There are two steps within the *foreseeable parties* approach. The first step is that an individual must fall within the scope of a listed category of claimants. The second step is that the individual must prove causation.

The first step of the *foreseeable parties* approach provides that only certain types of individuals can bring suit for purely economic losses.[289] Congress should identify the types of individuals that are most likely to suffer significant economic impact from an offshore oil spill. This list would include owners, lessees, and employees of businesses such as: hotels, seafood restaurants, commercial fishing boats, tour providers, those who regularly lease out property in the area and those who rent equipment to be used in affected waters.[290] The listed claimant requirement would reduce litigation since an individual who is not in one of these categories will have their claim promptly dismissed.

The purely economic interest that a listed claimant seeks must be lost profits. The "loss of real estate value" should not be recoverable as a purely economic interest. The listed categories focus on individuals who make their livelihood off of the ocean. The real estate value of one's home or business is not generally what an individual relies on for their livelihood.[291] The decision to draw the line in this manner is a policy decision: it reaches a balance between providing a discernable type of recoverable interest yet providing a fair remedy only to those who truly need it.

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[287] *See* REGION IV REGIONAL RESPONSE TEAM, U.S. COAST GUARD, MARINE OIL SPILL PREVENTION, http://ocean.floridamarine.org/ACP/STPACP/Documents/PDF/RRTIVDocs/34_RRT4_Oil_Spill_Prevent_Pamphlet.pdf (stating that "more than 90% of commercial port calls in U.S. waters are by vessels flying foreign flags.").

[288] Note that the divided system's *Robins Dry Dock* rule for non-drilling maritime torts would not include the exception for commercial fishermen. The *foreseeable parties* approach provides for these individuals and there is no logical reason to treat them differently than others who similarly rely on the ocean as part of their business.

[289] Functionally this is an expanded approach to the *Robins Dry Dock* exception for commercial fishermen.

[290] This list would include everything from charter fishing boats to scuba rentals companies and jet ski rental companies. Although it might be seen as unpopular, it would likely be appropriate to include offshore drillers as a listed category. Many individuals make a living off the ocean just like others and if they are able to do so in a safe manner they should not be barred from recovery by another company's carelessness.

[291] Of course the *foreseeable parties* list could include real estate agents, as they are an exception to this assertion. Congress could further limit liability by barring claims from those beyond a certain distance from the area oil contacts.

The second step of the *foreseeable parties* approach is proving causation. An individual must be able to show that as a matter of fact, the oil spill actually caused their purely economic losses.[292] To establish factual causation for purely economic losses an individual should first be able to show that "but for" the oil spill, it is reasonably certain that such profits would have been realized. To accomplish this, a claimant must first show the period of time that the oil affected their economic well-being. Next, the individual should be able to provide evidence of their usual economic situation during this same time frame in past years. Then, the individual must show that their economic situation during the affected period is distinctly different from that same time frame in recent years. Because the difference must be distinct, the claimant's economic situation should not be in line with general market trends for the type of economic loss they are alleging. A claimant could also use this method to recover lost future profits by showing that the period during which oil will likely affect their economic situation is different than past time frames.

After showing factual causation, the claimant should also be able to show that their damages are within the fair scope of liability for the offshore driller.[293] Some courts instead use the term "proximate cause."[294] However this term has been criticized because unlike a reference to the scope of liability, proximate cause does not accurately tell a jury what they should be deciding.[295] Therefore, instructions should be crafted to inform a jury that for liability to be imposed, the harm that occurred must be a result of the hazards that made that conduct tortious in the first place.[296]

D. Uniformity, Fairness, and Predictability

The fundamental goal of maritime law has always been to provide uniformity in the law for the benefit of maritime commerce. Treating offshore drilling different than other maritime activities provides this uniformity. The Framers were concerned with the negative affect on maritime commerce that would be caused by vessels traveling from port to port and having to comply with a different set of regulations and liability at each one.[297] While modern offshore drilling rigs are

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[292] Restatement (Third) of Torts § 29 (2010) (discussing the differences between factual causation and proximate causation).

[293] *See id.* (discussing how factual causation and proximate causation are different and should be treated separately). Note that this Article's analysis has focused on drilling rigs, which drill and cap the well, rather than production platforms, which subsequently pump the oil or gas out of the well for production. Production platforms are also capable of producing an oil spill. However, absent evidence that oil spills resulting from production platforms are comparable to those resulting from drilling rigs, both in frequency and severity, they should be excluded from this analysis and treated as any other non-drilling maritime tort.

[294] *Id.*

[295] *Id.* (stating that some juries interpret "proximate cause" to mean close in space or time, which is not necessarily a requirement for being within the fair scope of liability). Kenneth Feinberg, who oversees the fund BP set up to satisfy "legitimate claims," stated that "proximate cause" will be the determining factor in who can recover. *See* Andrew Restuccia, *Feinberg Takes Control*, THE FLORIDA INDEPENDENT, Aug. 23, 2010, http://floridaindependent.com/6321/feinberg-takes-control-of-spill-compensation-fund-dismisses-criticisms-from-mccollum. The article also notes that use of the term "proximate cause" is ambiguous and provides little guidance. *Id.*

[296] Restatement (Third) of Torts §29 (2010).

[297] *See* Major B. Harding, *supra* note 268, at 1529 (stating that "commerce would, arguably, be burdened if maritime players were subject to different rules in different ports.").

mobile, they do not move cargo from port to port like oil tankers do. Also, the vast majority of oil wells in an area like the Gulf of Mexico are located in federal waters and companies must obtain a federal permit to drill there.[298] Consequently, the main concern of offshore drilling rigs is complying with the federal government, and they will only be subject to state liability in the event that a spill happens to affect a state. This system would provide uniformity to the types of vessels that need it the most.

The proposed system would accomplish both uniformity and predictability through its preemption of state remedies. Scholars have noted OPA's shortcomings and proposed a return to a more uniform system.[299] Those engaging in maritime activities that do not involve drilling will know in advance that any maritime torts fall under the *Robins Dry Dock* rule. This will allow them to assess their businesses' potential liability accordingly. While the causation analysis necessary for offshore drilling will not be quite as clear, it will still be an improved approach since it is limited to a particular industry.[300] Also, the guidelines laid out in the *foreseeable parties* approach will provide for a streamlined system. Courts assessing purely economic losses will be provided with a better framework than they currently are and attorneys can better advise clients as to whether they have a viable claim. The United States has long favored the use of juries to decide factual issues of causation.[301] By providing these juries with more guidance on causation a system that is both fair and predictable has been laid out. Moreover, due to the infrequent occurrence of offshore drilling spills in the U.S. the *foreseeable parties* analysis will rarely be needed.[302]

The goal of fairness can also be accomplished by the proposed system. Since this system would already provide recovery for purely economic losses at the federal level an individual could bring a claim despite the fact that his state may not provide a similar remedy. The *foreseeable parties* approach is also fairer to many individuals since their jurisdiction may interpret OPA's subsection E narrowly. This remedy is needed because the *Robins Dry Dock* rule's restriction of purely economic recovery to commercial fishermen is unfair to others who are similarly situated. It is not clear why other individuals who rely on the ocean as part of their business, whether it be a seafood restaurant or a hotel catering to beach-seeking tourists, should not also be compensated. But while the *Robins Dry Dock* rule can be harsh, it also provides a bright line rule.

Fairness must be balanced alongside predictability. The balance of these two interests should be determined based on the risks of the particular situation. While applying the *Robins Dry Dock* rule to non-drilling maritime torts may seem strict, the likely alternative is to provide a "proximate

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[298] *See* BOEMRE, VISUAL 1: ACTIVE LEASES AND INFRASTRUCTURE (Sept. 29, 2010), http://www.gomr.boemre.gov/homepg/lsesale/visual1.pdf (last visited May 27, 2011); *See also* Margaret A. Walls, *Federalsim and Offshore Oil Leasing Resources,* 33 NAT. RESOURCES J. 777, 778 (1993) (observing that "under the current system the federal government has jurisdiction and control over leasing.").

[299] Swanson, *Federalism, supra* note 34, at 407 (calling for a return to the more uniform *Jensen* approach).

[300] If a state law provides for purely economic losses then in the event of a maritime tort in their water a court will have to address difficult causation questions for numerous claimants. Under the divided system approach only maritime torts that stem from an offshore spill will subject a court to this.

[301] Terry Carter, *Jury Trial,* 3 No. 48 ABA J. E-REPORT 6 (2004) (quoting U.S. Supreme Court Justice Sandra Day O'Connor for the observation that "[o]ur nation relies on the determinations of juries of our peers … because [they] are the ones capable of deciding who is to be believed and what the facts are.").

[302] *See Oil Spills and Disasters,* InfoPlease, http://www.infoplease.com/ipa/A0001451.html (last visited July 11, 2011) (noting that before the Deepwater Horizon the last major offshore drilling spill near U.S. waters occurred in 1979).

causation" approach to all maritime torts. This approach would clearly not satisfy the goal of predictability. The opposite approach would be to apply the *Robins Dry Dock* rule to all maritime torts. But as this paper has shown, such an approach would be unfair to many. Because it is practically impossible to establish a system that completely satisfies uniformity, predictability, and fairness, the proposed system should balance these interests in a way that benefits society. The divided system provides that balance.

E. The Offshore Drilling Industry Can Withstand Increased Liability

The divided system, and in particular the *foreseeable parties approach*, may increase the potential liability of offshore drilling rigs. Courts entertaining tort claims have long been hesitant to expose parties to "crushing liability."[303] However the offshore drilling industry is largely immune from this for two reasons. First, offshore oil drilling is incredibly profitable. In 2010 it was reported that of the six U.S. companies with the highest revenues, three were in the oil industry.[304] Months after the Deepwater Horizon spill BP estimated that the disaster had cost it $40 billion, yet the company was already in the process recovering $30 billion by selling off assets.[305] The company had also sold four oil and gas fields for $650 million and was confident that other allegedly responsible parties would assist in splitting the costs.[306] Second, because a spill from an offshore drillings rig is rare, a company who takes proper precautions is unlikely to subject itself to extensive liability. When a party like BP undertakes an incredibly profitable, yet risky venture like offshore oil drilling and ignores clear warning signs, it does not seem unfair to subject them to the damage they ultimately cause.

F. The Divided System is Consistent with the U.S. Clean Energy Policy

Finally, the divided system may help further the United States' clean energy initiative.[307] President Obama has put in measures to decrease the emission of carbon pollution and also to convert to clean energy.[308] While the primary purpose of the divided system is to achieve the goals already mentioned, the proposal might pressure certain companies to invest more heavily in energy development that does not stem from fossil fuels. Because any company who seeks to enter the offshore drilling market will be exposed to a wider scope of potential liability it will be more difficult for them to obtain financing and more expensive to acquire various forms of insurance.

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[303] *See* Strauss v. Belle Realty Co., 482 N.E.2d 34, 36 (N.Y. App. Ct. 1985) (stating that courts have a responsibility "in fixing the orbit of duty 'to limit the legal consequences of wrongs to a controllable degree' and to protect against crushing ... liability").

[304] *Rankings of Largest U.S. Companies by Revenue*, FORTUNE, http://money.cnn.com/magazines/fortune/fortune500/2010/full_list/ (last visited July 11, 2011) (listing Exxon Mobil, Chevron, and ConocoPhillips in the top six).

[305] AP, *BP Returns to Profits After Gulf Oil Spill*, CBSNEWS, Nov. 2, 2010, http://www.cbsnews.com/stories/2010/11/02/business/main7013714.shtml.

[306] *Id.*

[307] *See* President Barack Obama, June 15, 2010 Speech on Energy and the Environment, *available at* http://www.whitehouse.gov/issues/energy-and-environment.

[308] *Id.*

Companies who are already major players in the offshore drilling industry may seek to diversify the way in which they engage in energy production. Although it is unlikely that the initial returns on wind farms or solar panel communities would be as substantial as those from offshore drilling, the increased exposure to liability may increase the overall attractiveness of these alternatives. Some major oil companies have already begun to diversity their business with clean energy initiatives.[309] The divided system would provide a further impetus for these companies to convert to clean energy since the potential liability of those ventures would be less than with offshore drilling.

VI. Conclusion

As long as offshore oil drilling in the Gulf continues, the threat to Florida's environment and economy looms over the horizon. Yet the uncertainty discussed in this paper has shown that the problem is not exclusive to just Florida. The last century has seen numerous failed attempts by the courts and Congress to try and provide clarity to oil spill liability. However it is unlikely that any system will make everyone happy. The best evidence of this occurred in the months after the Deepwater Horizon spill. Angry citizens pleaded with the government to clean up the spill faster and prevent it from ever happening again.[310] In its haste to figure out a solution the Federal Government placed a moratorium on offshore drilling in the Gulf.[311] Rather than improve the situation, the ban devastated many Gulf Coast residents who rely on the oil and gas industry for their livelihood.[312] Whether it is the environment or the economy there are simply too many interests to reach a perfect balance. However, by factoring in fairness with the historical principles favoring uniformity and predictability, it is possible to implement a superior system than the one currently governing oil spill liability.

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[309] *See,* BP, *Clean Energy,* BP.COM, http://www.bp.com/multipleimagesection.do?categoryId=7042&contentId=7051420 (last visited July 11, 2011).

[310] Kelly Cobiella, *Ala. Angry Over Slow Spill Cleanup, Compensation*, CBSNEWS, June 9, 2010, http://www.cbsnews.com/stories/2010/06/09/national/main6564115.shtml (quoting Alabama residents upset that despite the sight of oil washing into their bays there was a pile of unused boom on dry land and "one boat with a shovel.").

[311] Penny Starr, *Republicans Say Obama's Drilling Moratorium Could have Taxpayers Picking up Tab for More Unemployed Oil Workers,* CNSNEWS, July 29, 2010, http://www.cnsnews.com/news/article/70190.

[312] *See* Alastair Good, *Drilling Moratorium Devastates Louisiana Business,* GulfCoastProject, http://gulfcoastproject.org/gulf-of-mexico-oil-spill/drilling-moratorium-devastates-louisiana-business (last visited July 11, 2011) (reporting that a Louisiana business that sold drilling mud lost 95% of their business overnight).

Redefining the Territorial Sea in the Clean Water Act: Replacing Outdated Terminology and Extending Regulatory Jurisdiction

Joe Mathews[1]

Abstract: In 1988, President Ronald Reagan extended the breadth of the territorial sea of the United States from three nautical miles to twelve. By Presidential Proclamation the United States asserted sovereignty and jurisdiction over the territorial sea extending from the baseline seaward a distance of twelve nautical miles. The presidential proclamation specifically stated that it did not extend or alter "existing Federal or State law or any jurisdiction, rights, legal interests, or obligations derived therefrom."[2] Some federal laws have not been updated to reflect this boundary change and the extension of the territorial sea has resulted in inconsistent definitions of the territorial sea in U.S. domestic law.[3] The Clean Water Act (CWA) is one law that has not been updated to reflect the change; in the CWA, the territorial sea is defined as extending seaward a distance of three miles. This Article explores the effects that the outdated definition of the territorial seas has on the two main permitting programs established by the CWA, and the potential environmental benefit that could result from updating the definition to make it consistent with the territorial sea claimed by the United States under international law.

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[2] Proclamation No. 5928, Territorial Sea of the United States of America, 54 Fed. Reg. 777 (Jan. 9, 1989).

[3] U.S. COMMISSION ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY: FINAL REPORT OF THE U.S. COMMISSION ON OCEAN POLICY 43 (2004).

I. Introduction

Currently the United States' most substantively extensive claim of jurisdiction in ocean waters is the jurisdiction that is asserted over the territorial seas.[4] The first formal claim to a territorial sea was made by Secretary of State Thomas Jefferson in 1793.[5] In a letter to the British Minister, Secretary of State Jefferson asserted that the territorial protection of the United States would extend from the seashore to a distance of three geographic miles, or one marine (sea) league (the maximum range of a cannon ball at the time).[6] The breadth of the territorial sea remained at three geographic miles for nearly 200 years until 1988 when, through a Presidential Proclamation, President Ronald Reagan extended the breadth of the U.S. territorial sea from three to twelve nautical miles.[7] Today, the United States claims full sovereignty and jurisdiction over the band of ocean waters that extends from the shore out a distance of twelve nautical miles.[8]

The Clean Water Act (CWA) was enacted in 1972 and has not been amended to incorporate the extension of the territorial sea in 1988. In the CWA, the "territorial seas" is defined as: "the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles."[9] In some of the regulatory programs created by the CWA, the term "territorial seas" is used to define the seaward extent of the regulatory authority being asserted. Although the United States' claims full sovereignty and jurisdiction out to twelve nautical miles, by continuing to use an outdated definition of the territorial seas, Congress has left a large segment of the Nation's waters out of the regulatory jurisdiction of the agencies charged with implementing the CWA. The CWA's potential for achieving its purpose of "restor[ing] and maintain[ing] the chemical, physical, and biological integrity of the Nation's waters" is thus unduly limited.[10]

From a practical standpoint, the CWA's outdated territorial sea definition has not resulted in any urgent or egregious regulatory problems that could automatically be resolved through a Congressional amendment updating the definition to conform to the territorial sea claimed by the United States under international law. However, the continued use of this outdated definition in

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[4] *See*, Territorial Sea Proclamation, *supra* note 2.
[5] THOMAS A. CLINGAN, JR., THE LAW OF THE SEA: OCEAN LAW AND POLICY 84 (Austin & Winfield, Publishers 1993).
[6] *Id.*
[7] *See* An Ocean Blueprint, *supra* note 3.
[8] Territorial Sea Proclamation, *supra* note 2.
[9] 33 U.S.C. § 1362(8).
[10] *Id.* § 1251(a).

the CWA and other federal laws underscores the confusion created by the piecemeal extension of U.S. jurisdiction in ocean and coastal waters through numerous executive orders issued over a broad period of time and by Congress' failure to update the terminology.

II. Jurisdiction in Ocean and Coastal Waters

A. International Law

The United Nations (U.N.) has held three conferences on the law of the sea in an effort to develop a consistent, codified law of the sea. The First U.N. Conference on the Law of the Sea (UNCLOS I) was held in 1958 and resulted in the 1958 Geneva Conventions on the Law of the Sea which included the adoption of four treaties: the Convention on the Territorial Sea and Contiguous Zone; the Convention on the Continental Shelf; the Convention on the High Seas; and the Convention on Fishing and Conservation of the Living Resources of the High Seas.[11] The Second U.N. Conference on the Law of the Sea (UNCLOS II) was held in 1960 and failed to achieve its sole purpose of determining the legal breadth of the territorial sea.[12] The Third U.N. Conference on the Law of the Sea (UNCLOS III) began in 1973 and concluded in December of 1982 opening for signature the U.N. Convention on the Law of the Sea.[13] The Convention has not been signed by the United States.[14]

In general, UNCLOS III divides ocean waters into five jurisdictional zones (the territorial sea, the contiguous zone, the exclusive economic zone, the continental shelf, and the high seas) and establishes the rights and duties of coastal states and other nations within those zones. The territorial sea of a coastal state is essentially an extension of the state's sovereignty into ocean waters. UNCLOS III states that: "[t]he sovereignty of a coastal state extends beyond its land territory and internal waters … to an adjacent belt of sea, described as the territorial sea."[15] This includes sovereignty over the air space above, and the seabed and subsoil below the territorial sea.[16]

Each coastal "state has the right to establish the breadth of its territorial sea up to a limit not exceeding 12 nautical miles, measured from baselines as determined in accordance with this Convention."[17] While the ships of all states have the right of innocent passage through the territorial sea,[18] coastal states have the right to establish laws regulating such passage[19] and prevent

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[11] U.S. COMMISSION OF OCEAN POLICY, APPENDIX 6 TO FINAL REPORT: REVIEW OF U.S. OCEAN AND COASTAL LAW: THE EVOLUTION OF OCEAN GOVERNANCE OVER THREE DECADES 4 (2004), *available at* http://www.oceancommission.gov/documents/full_color_rpt/append_6.pdf.

[12] Clingan, *supra* note 5, at 1.

[13] UNITED NATIONS, OFFICE OF LEGAL AFFAIRS, DIVISION FOR OCEAN AFFAIRS AND THE LAW OF THE SEA, OFFICIAL TEXTS OF THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA AND OF THE AGREEMENT RELATING TO THE IMPLEMENTATION OF PART XI OF THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA WITH INDEX AND EXCERPTS FROM THE FINAL ACT OF THE THIRD UNITED NATIONS CONVENTION ON THE LAW OF THE SEA 3-6 (United Nations 2001).

[14] Appendix 6 of An Ocean Blueprint, *supra* note 11, at 4-5.

[15] United Nations Convention on the Law of the Sea art 2(1), opened for signature Dec. 10, 1982, 1833 U.N.T.S. 397 (entered into force Nov. 16, 1994) [hereafter UNCLOS III].

[16] *Id.* at art. 2(2).

[17] *Id.* at art 3.

[18] *Id.* at art. 17.

passage if it is not innocent.[20] Coastal states may regulate a range of activities within their territorial seas, including but not limited to such subjects as navigation safety and maritime traffic; protection of cables and pipelines; conservation of the environment and living natural resources; pollution; and preventing infringement of the coastal State's customs, fiscal, immigration and sanitary laws and regulations.[21] Coastal states have a duty to not interfere with innocent passage and publicize any known navigational dangers within the territorial sea.[22]

Though the United States has not signed or ratified UNCLOS III, it has asserted jurisdiction over various maritime zones (including the territorial seas) through a series of Presidential proclamations. With a few exceptions, the maritime zones claimed by the United States are consistent with the zones established under UNCLOS III.[23] Because the United States has not signed or ratified the UNCLOS III Convention, the entitlement of the United States, under international law, to the rights set forth in the Convention depends mostly on whether those rights are codifications of customary international law, or are contained in another convention.[24]

B. The Territorial Sea

As mentioned above, the United States' first formal claim to a territorial sea was made by Secretary of State Thomas Jefferson in 1793.[25] In a letter to the British Minister, Secretary of State Jefferson asserted that the territorial protection of the United States would extend from the seashore to a distance of three geographic miles, or one marine (sea) league (the maximum range of a cannon ball at the time).[26] The breadth of the United States territorial sea remained at three geographic miles for nearly 200 years.[27]

Then, in 1988, President Ronald Reagan, by presidential proclamation, extended the breadth of the United States territorial sea from three to twelve nautical miles from shore.[28] With the extension of the territorial sea, the United States now exercises sovereignty and jurisdiction over the band of waters that extend a distance of twelve nautical miles from shore.[29] The waters of the

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[19] *Id.* at art. 21.
[20] *Id.* at art. 25.
[21] *Id.* at art. 21.
[22] *Id.* at art. 24.
[23] See, Executive Order 9633, Reserving and Placing Certain Resources of the Continental Shelf Under the Control and Jurisdiction of the Secretary of the Interior (Sept. 28, 1945); Proclamation No. 5030, Exclusive Economic Zone of the United States of America, 48 Fed. Reg. 10605 (1983); Territorial Sea Proclamation, *supra* note 2; Proclamation No. 7219, Contiguous Zone of the United States, 64 Fed. Reg. 48701 (Sept. 8, 1999).
[24] Clingan, *supra* note 5, at III.
[25] *Id.* at 84.
[26] *Id.*
[27] An Ocean Blueprint, *supra* note 3.
[28] Territorial Sea Proclamation, *supra* note 2.
[29] *Id.* Throughout this article the seaward extent of the various zones discussed will be explained in terms of the number of miles from shore or the baseline. The seaward extent of the maritime zones is typically measured as the distance from the baseline. The exact location of the baseline, and consequently the seaward extent of the various zones, are established based on specific rules, and can vary if a particular zone overlaps with the zone of adjacent coastal states.

U.S. territorial sea, as well as the air above, and seabed and subsoil below are all subject to the sovereignty and jurisdiction of the United States, and the ships of other nations have only the right of innocent passage. As such, the jurisdiction asserted by the United States over the territorial seas is its most substantively significant claim to jurisdiction in ocean waters.[30] The United States asserts more power and control in the territorial seas than in any other maritime zone.

President Reagan specifically stated in his 1988 proclamation that the extension of the territorial sea did not extend or alter "existing Federal or State law or any jurisdiction, rights, legal interests, or obligations derived therefrom."[31] Thus, laws existing prior to 1988 have to be amended to reflect the extension of U.S. sovereignty and jurisdiction. Over twenty years later, some laws still have not been updated to reflect the extension of the territorial sea from three to twelve nautical miles, and many U.S. laws still use a definition of the territorial seas that is inconsistent with the territorial seas that the United States claims under international law. The Clean Water Act is one of those laws.

III. The Clean Water Act

A. *Purpose and Substantive Jurisdiction of the Clean Water Act*

The purpose of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[32] The overarching goal of the Clean Water Act is eliminating "the discharge of pollutants into the navigable waters" and until that goal can be met, the interim goal is to achieve "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water" wherever possible.[33] The CWA sets forth several declarations of policy based around those stated goals, which include prohibiting the discharge of toxic pollutants, assisting in the improvement of wastewater treatment, and supporting research aimed at attaining the goals of the CWA.[34]

To fulfill its purpose and accomplish its goals, § 301 of the CWA makes "the discharge of any pollutant by any person … unlawful"[35] unless it is done in accordance with §§ 302, 306, 307, 318, 402, or 404.[36] The § 301 prohibition on the discharge of any pollutant is broad and all-inclusive, covering a wide range of material discharged from nearly any source that is not diffuse. "Discharge of a pollutant" is defined in § 502 as "any addition of any pollutant to navigable waters from any point source"[37] and "any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft."[38] The CWA defines a

[30] *Id.*
[31] *Id.*
[32] 33 U.S.C. § 1251(a).
[33] *Id.* §§ 1251(a)(1)-(7).
[34] *Id.*
[35] *Id.* § 1311(a). The U.S. Code citations for the referenced sections are: §§ 1312, 1316, 1317, 1328, 1342, or 1344.
[36] *Id.*
[37] *Id.* § 1362(12)(a).
[38] *Id.* § 1362(12)(b).

point source as: "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged."[39] The CWA defines "pollutant" as "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical waste, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water."[40]

The CWA allows for the discharge of pollutants if it is in accordance with one of the various permitting provisions established by the Act. The two main permitting programs are: the dredge and fill permitting program established under § 404 of the CWA and administered by the U.S. Army Corps of Engineers (USACE);[41] and the national pollutant discharge elimination system (NPDES) permitting program established under § 402 of the CWA and administered by the U.S. Environmental Protection Agency (EPA).

B. Seaward Extent of Clean Water Act Jurisdiction

The geographic extent of the jurisdiction of the CWA can be found in the definition of the term "discharge of a pollutant," which is defined as "any addition of any pollutant to navigable waters from any point source" and "any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft".[42] Based on that definition, the CWA's jurisdiction to prohibit the "discharge of a pollutant" covers three different zones of waters: "navigable waters," the "contiguous zone," and the "ocean."[43]

1. Navigable Waters

The CWA defines "navigable waters" as "waters of the United States including the territorial seas."[44] The "territorial seas" is defined in the CWA as "the belt of the seas measured from the line of ordinary low water along that portion of the coast which is in direct contact with the open sea and the line marking the seaward limit of inland waters, and extending seaward a distance of three miles."[45] The term "navigable waters" includes all internal waters and coastal waters out a distance of three miles from shore. The use of the outdated definition of the territorial sea limits the seaward extent of navigable waters to three miles instead of the twelve nautical miles asserted under the Territorial Sea Proclamation and recognized by the international community.

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[39] *Id.* § 1362(14).
[40] *Id.* § 1362(6).
[41] *See id.* §1344(d).
[42] *Id.* § 1362(12).
[43] Robin K. Craig, *Urban Runoff and Ocean Water Quality in Southern California: What Tools Does the Clean Water Act Provide?*, 9 CHAP. L. REV. 313, 331 (2006).
[44] 33 U.S.C. § 1362(7).
[45] *Id.* § 1362(8)

2. The Contiguous Zone

The CWA defines the "contiguous zone" as "the entire zone established or to be established by the United States under article 24 of the Convention of the Territorial Sea and the Contiguous Zone [15 UST § 1606]."[46] As defined in the Convention of the Territorial Sea and the Contiguous Zone, a coastal State's contiguous zone is "zone of the high seas contiguous to its territorial sea" which "may not extend beyond twelve miles from the baseline from which the breadth of the territorial sea is measured."[47] The CWA's definition of the contiguous zone (like the territorial seas) is outdated, as UNCLOS III expanded the acceptable width of the contiguous zone (12 nm beyond the territorial sea or the area 12 to 24 nm from the baseline). Furthermore, the U.S. contiguous zone, like the territorial sea, was extended by presidential proclamation to make it consistent with the maritime zones established in UNCLOS III.

Currently, the United States claims a contiguous zone that is contiguous to the territorial sea, and extends seaward a distance of 24 nautical miles from shore.[48] This inconsistency could cause problems if the definition of the territorial seas were to be updated without also updating the definition of the contiguous zone. In such a situation, the contiguous zone, as defined in the CWA, would be completely subsumed by the new (12 mile) extent of "navigable waters." This overlap, however, would be unlikely to affect day-to-day management because the seaward extent of the contiguous zone is used to define the inland boundary of ocean waters.

3. The Ocean

The "ocean" is defined as "any portion of the high seas beyond the contiguous zone."[49] Although the high seas is not defined in the CWA, the "ocean" as used in the CWA has been interpreted to include the Exclusive Economic Zone (seaward a distance of 200 nautical miles)[50] as well as the high seas beyond the jurisdictional reach of the United States.[51] Part VII of UNCLOS III, which discusses the "High Seas" states that it applies "to all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State."[52] Although such an expansive definition was unlikely the intention of Congress when it passed the CWA, the statute does assert authority over ocean waters falling outside U.S. jurisdiction and it is a reasonable interpretation of the statutory language in light of UNCLOS III. This serves as another example of the confusion generated by

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[46] *Id.* § 1362(9).

[47] Law of the Sea: Convention of the Territorial Sea and the Contiguous Zone, art. 24, Apr. 29, 1958, 15 U.S.T. 1606 (entered into force September 10, 1964).

[48] Contiguous Zone Proclamation, *supra* note 23.

[49] 33 U.S.C. § 1362(10).

[50] The 3.4 million square nautical mile (4.5 million square mile) U.S. EEZ covers an area that is larger than the area covered by all 50 states combined miles. *See*, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, THE UNITED STATES IS AN OCEAN NATION, *available at* http://aquaculture.noaa.gov/pdf/20_eezmap.pdf.

[51] Robin Kundis Craig & Sarah Miller, *Ocean Discharge Criteria and Marine Protected Areas: Ocean Water Quality Protection Under the Clean Water Act*, 29 B.C. ENVTL. AFF. L. REV. 1, 13-14 (2001).

[52] UNCLOS III, *supra* note 15, art. 86.

Congress' failure to update the CWA to reflect the existing extent of maritime claims under international law.

IV. Significance of the Outdated Definition of the Territorial Sea

A. NPDES Permitting

The NPDES provisions of § 402 of the Clean Water Act authorize the EPA to issue permits for the discharge of any pollutant, except for those regulated under another provision such as § 404 or § 318.[53] Under § 402, the EPA may issue permits "for the discharge of any pollutant, or combination of pollutants, … upon condition that such discharge will meet … all applicable requirements [of the CWA]."[54]

Section 402 is applicable to all three jurisdictional zones established in the definition of "discharge of a pollutant": navigable waters, the contiguous zone and the ocean.[55] Fortunately, because "ocean waters" has been interpreted to include the U.S. Exclusive Economic Zone, the CWA's outdated definition of the territorial sea does not limit the geographical scope of § 402. The EPA can require NDPES permits for the "discharge of pollutants" within 200 nm miles from shore. Although updating the definition of territorial sea would clarify the terminology, it would not change the jurisdictional reach of the NPDES permitting provisions.

B. Dredge and Fill Permits

Under § 404 of the CWA, the U.S. Corps of Engineers issues permits "for the discharge of dredged or fill material into the navigable waters at specified disposal sites."[56] USACE regulations define "fill material" as "material placed in waters of the United States which has the effect of: (i) Replacing any portion of a water of the United States with dry land; or (ii) Changing the bottom elevation of any portion of a water of the United States."[57] Examples of "fill material" include "rock, sand, soil, clay, … and materials used to create any structure or infrastructure in waters of the United States."[58] The "discharge of fill material" is defined as "the addition of fill material into waters of the United States."[59] USACE regulations go on to state that this includes:

> Placement of fill that is necessary for the construction of any structure or infrastructure in a water of the United States; the building of any structure, infrastructure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, or other uses; … beach nourishment; … fill for structures such as sewage treatment facilities, intake and outfall pipes associated with

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[53] 33 U.S.C. § 1342(a).
[54] *Id.* § 1342(a)(1).
[55] *Id.* § 1362.
[56] *Id.* § 1344(a).
[57] 33 C.F.R. § 323.2(e)(1).
[58] *Id.* § 323.2(e)(2).
[59] *Id.* § 323.2(f).

> power plants and subaqueous utility lines; ... placement of overburden, slurry, or tailings or similar mining-related materials; and artificial reefs.[60]

"Dredged material" is defined as "material that is excavated or dredged from waters of the United States"[61] and "discharge of dredged material" is defined in USACE regulations as "any addition of dredged material into, including redeposit of dredged material other than incidental fallback within, the waters of the United States."[62] A permit is not required for an "incidental addition, including redeposit," provided that the incidental addition "does not or would not have the effect of destroying or degrading an area of waters of the United States."[63]

In determining whether to issue a permit under § 404, the USACE considers, among other things, the environmental consequences of the proposed discharge, and the USACE will prohibit a discharges "unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern."[64] Thus the permitting provisions of § 404 of the CWA provide the USACE with the authority to evaluate the potential environmental consequences of regulated activities and prevent an activity from taking place if the activity could have unacceptable adverse environmental impacts.

Like the EPA's NPDES permitting jurisdiction, the extent of the USACE's jurisdiction under the dredge and fill provisions of § 404 is defined by the boundaries of "navigable waters." As discussed earlier, navigable waters include the territorial seas, which, based on the CWA's outdated definition only extends three miles from the baseline.[65] Unlike § 402, however, the § 404 permitting provisions do not extend to the contiguous zone or the ocean. The current definition of the territorial seas in the CWA, therefore, improperly limits the seaward extent of the USACE's regulatory jurisdiction under § 404 to three miles from shore, thereby excluding a significant portion of the actual territorial sea from regulation (the area three to twelve miles from shore).[66]

Due to the CWA's outdated definition of the territorial sea, the regulatory protections provided by § 404 of the CWA apply to approximately 25% of the territorial sea that is actually claimed by the United States; leaving out nearly 75% of the waters subject to the sovereignty and jurisdiction of the United States. The U.S. has over 12,380 miles of coastline (19,924 km).[67] Updating the definition of the territorial seas in the CWA would add to the waters protected by the dredge and fill permitting provisions a nine mile wide band of waters along a significant

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[60] *Id.*
[61] *Id.* § 323.2(c).
[62] *Id.* § 323.2(d)(1).
[63] *Id.* § 323.2(3)(i).
[64] 40 CFR § 230.1(c).
[65] *Id.*
[66] This article is limited to a consideration of the impacts that the definitions of the territorial seas has on the permitting provisions of the CWA, but it should be noted that the definition could alter other provisions of the CWA as well. A full analysis of the effect of a definition change on the other provisions must be undertaken before amendments to the CWA are proposed.
[67] Central Intelligence Agency, World Fact Book, https://www.cia.gov/library/publications/the-world-factbook/geos/us.html.

portion of the United States' 12,380 miles of coastline.[68] Bringing such a significant portion of the nation's waters into the § 404 program would clearly enhance the potential of fulfilling the CWA's purpose to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[69]

C. *Implications for Offshore Activities*

Today, advances in technology are facilitating society's ability to venture further from shore to exploit the natural resources of the ocean waters beyond three miles. As the examples discussed below demonstrate, if located within 3 nm, many of these activities would fall within the USACE's § 404 permitting jurisdiction.[70] The expanding access to ocean waters, and use of offshore waters as an alternative source of energy, has great potential to be economically and environmentally beneficial. However, if the potential environmental impacts of these technologies and activities are not adequately scrutinized before they are put into use on a commercial scale, then the unintended consequences of these activities could far outweigh the intended environmental and economic benefits. The potential environmental benefits of activities in offshore waters cannot overshadow the environmental impacts of increasingly extensive and intensive human activity in ocean waters.

1. Oil and Natural Gas Production

Offshore production of oil and gas involves a complex array of operations and infrastructure in offshore waters. Many of these activities could fit within the substantive jurisdiction of §404 of the CWA if the territorial sea definition was expanded from 3 to 12 nm. The process of producing oil and gas in offshore waters begins with exploration. A company obtains an exploration permit from the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) (formerly the Mineral Management Service) to conduct geological and geophysical exploration in an area of offshore waters. Next, offshore blocks are leased from the BOEMRE, after which the lessee conducts seismic surveying operations. With the results of the seismic surveys, exploration wells are drilled. Then development wells are drilled, production facilities are installed, and production operations begin. During ongoing production, the oil and gas are transported to shore using pipelines or tanker ships. Eventually production comes to an end and the production facilities are decommissioned and removed.[71]

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[68] For various reasons (like proximity to other coastal States) there are portions of the U.S. coastline for which the U.S. cannot claim a full territorial sea of twelve nautical miles. Thus, the band of waters added to the geographic jurisdiction of § 404 by updating the definition of the territorial seas in the CWA would not necessarily be nine miles wide for the entire 12,380 miles of U.S. coastline.

[69] 33 U.S.C. 1251(a).

[70] Whether or not the activities discussed would actually be subject to the substantive jurisdiction of §404 of the CWA is fact specific and dependent on a number of considerations that are beyond the scope of this article.

[71] U.S. DEPARTMENT OF THE INTERIOR, MINERALS MANAGEMENT SERVICE, GULF OF MEXICO OCS REGION, GULF OF MEXICO DEEPWATER OPERATIONS AND ACTIVITIES; ENVIRONMENTAL ASSESSMENT, at II-3 (2000).

Most deepwater drilling of oil and gas wells is accomplished using floating drilling rigs, which are either drillships or semisubmersibles. These floating drilling rigs have to remain stationary while drilling is taking place. Semisubmersibles are typically held in place by several (usually 8) catenary anchors. The length of the anchor lines may be 5 to 7 times the water depth to ensure enough scope to hold the rig in place, thus the footprint of the impact area of this type of rig is larger in deeper waters. Dynamic positioning systems are used to hold most drillships in place during drilling. Dynamic positioning systems use thrusters controlled by computers and global positioning systems to hold the drillship in place.[72]

The upper portion of wells drilled by a floating drilling are drilled under "riserless" conditions. When drilling under riserless conditions the drill cuttings, sand and silt removed from the well (well solids) are deposited directly on the seafloor. Deepwater wells are typically drilled riserless to a depth of about 2,000 feet below the mudline. After the upper portion of the well is drilled, casings are cemented into the upper portions of the well, a blowout preventer is installed, and a riser is connected to the blowout preventer. For the remainder of the drilling process the drilling fluid and well solids are returned through the riser to the surface where the drilling fluid is separated out and re-used. If it is allowed by an NPDES permit, the well solids are then discharged overboard.[73]

Each phase in the production of oil and natural gas in offshore waters has environmental impacts that fall within the scope of impacts that the CWA seeks to protect. Impacts from the construction and installation of drilling platforms include increased turbidity from dredging, disturbance of the sea bed, noise, vibration, habitat alteration, and air and water pollution. Environmental impacts associated with drilling for and production of oil and natural gas include disposal and handling of drilling fluids, disposal of "cuttings" which are usually removed from the well and deposited on the sea floor. There is also a risk of adverse environmental impacts associated with accidental spills that could occur during the production phase.[74]

There are also impacts associated with the installation, maintenance, and operation of pipelines.[75] Impacts from pipeline installation and maintenance include impacts on the sea floor and subaqueous lands associated with subaqueous excavation. These impacts can be reduced by requiring producers to modify their operations to avoid impacting significant seafloor habitat and organisms.[76]

As a range of laws beyond the Corps' § 404 permitting program affect offshore oil and gas production, further research is needed to determine whether additional environmental protection could be achieved by extending the § 404 program to the full extent of the territorial sea (12 nm). For example, oil and gas exploration and production in offshore waters is regulated as a point source under the NPDES provisions of the CWA. The EPA has developed effluent limitations guidelines and new source performance standards for point source discharges associated with oil and gas production and exploration.[77] Regulated discharges from oil and natural gas production and exploration include discharges of: drilling fluids, cuttings, produced water, sanitary wastes, and

[72] *Id.* at II-10.
[73] *Id.* at II-14.
[74] *Id.* at 4.
[75] *Id.* at 5.
[76] *Id.* at 6.
[77] *See* 40 C.F.R. 435 Subpart A (2010).

deck drainage.[78] The EPA's program, however, is focused primarily on water quality, as opposed to whether the activity would result in the deposit of dredge and fill material on the seafloor.

2. Offshore Alternative Energy Sources

The potential energy sources in offshore waters are not limited to oil and gas. Offshore sources of alternative energy are still in emergent phases of development but they are rapidly developing. Offshore sources of alternative energy include: wind, wave, hydrothermal, current, and solar energy. Though these sources have not yet been fully implemented in the U.S. their potential is real and the technology exists for many of the sources. The technologies for offshore sources of alternative energy that are most likely to be implemented on a commercial level within the next five to seven years in offshore waters beyond three miles include: capture of energy from wind, waves, and ocean current.[79] Other potential sources of offshore energy that are not discussed in this article include offshore solar energy[80] and ocean thermal energy.[81]

Technological advancements and the push for more environmentally friendly energy sources will fuel the development of offshore sources of alternative energy. This desire to find new sources of energy that are not also significant sources of greenhouse gasses cannot be allowed to overshadow other potential environmental consequences. The danger of this happening is more significant given the political popularity of green energy and the rush to reduce U.S. dependence on fossil fuels.

Many of the activities associated with exploitation of these alternative offshore energy sources may amount to deposit of dredge and fill material and could be subject to the permitting requirements of § 404 of the CWA. As defined in USACE regulations the term fill material includes "materials used to create any structure or infrastructure in waters of the United States."[82] Thus, depending on how the USACE interprets the term infrastructure, much of the material placed in the water associated with offshore sources of alternative energy could be considered materials used to create infrastructure. Nearly all of the technologies for the exploitation of

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[78] Bureau of Ocean Energy Management, Regulation, and Enforcement, Environmental Compliance, Branch of Environmental Assessment, http://www.boemre.gov/eppd/compliance/cwa/index.htm.

[79] *See* MINERALS MANAGEMENT SERVICE, U.S. DEPARTMENT OF THE INTERIOR, PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR ALTERNATIVE ENERGY DEVELOPMENT AND PRODUCTION AND ALTERNATIVE USE OF FACILITIES ON THE OUTER CONTINENTAL SHELF, at ES-2 (2007) *available at* http://www.ocsenergy.anl.gov/eis/guide/index.cfm (stating that the EIS is limited to wind, wave, and ocean current because the MMS expected applications for the development of only those technologies between 2007 and 2014 and discussing that other technologies were not considered in the EIS because they are not yet economically or technologically feasible or because they do not occur outside of three nautical miles).

[80] *See* OCS Alternative Energy and Alternative Use Programmatic EIS Information Center, Offshore Solar Energy, http://ocsenergy.anl.gov/guide/solar/index.cfm.

[81] *See* U.S. Department of Energy, Energy Savers, Ocean Thermal Energy Conversion, http://www.energysavers.gov/renewable_energy/ocean/index.cfm/mytopic=50010; *see also*, Ocean Energy Council, Examining the Future of Ocean Thermal Energy Conversion, http://www.oceanenergycouncil.com/index.php/OTEC-News/Examining-the-future-of-Ocean-Thermal-Energy-Conversion.html.

[82] 33 C.F.R. § 323.2(e)(2).

offshore sources of alternative energy require the installation of some infrastructure that is attached to the seabed in some way.

a) Offshore Wind Energy

Wind is the fastest growing energy source in the world, growing at a rate of approximately 20 to 30% per year.[83] Offshore turbines can produce more electricity than those onshore because offshore winds, in general, are less turbulent and flow at higher speeds. Offshore wind turbines consist of: a rotor (blades and blade hub) which is connected to a turbine assembly; a tower which supports the rotor and turbine assembly; and a foundation which supports the tower.[84] Production of offshore wind energy has been limited by the extreme requirements on foundations in offshore waters. The technologies that are in use today for offshore wind energy facilities include gravity foundations and steel monopiles. Gravity foundations use the weight of large concrete structures (about 20m [66 ft] in diameter) that are placed on the seafloor to stabilize the turbine.[85] This type of foundation cannot be used in water deeper than 30 meters.[86] In order to use gravity foundations the seafloor must first be prepared to ensure that the concrete structure is placed on a smooth surface. Preparation of the seabed involves the dredging and removal of sediment. Steel monopoles are steel piles that are driven 10-20 meters into the seabed using a vibrating hammer or pile driving ram.[87] Monopile foundations do not require as much seabed preparation as gravity foundations.[88] Depending on the location of the turbine, either type of foundation may need erosion (scouring) protection where the foundation meets the sea floor. This is accomplished by placing layers of stone, cement bags or other devices around the foundation to prevent wave or current action from eroding away the sediment supporting the foundation.[89]

Environmental impacts from wind turbines may include sedimentation, noise, and vibration. The foundations of the wind turbines can act as artificial reefs.[90] Support pilings, anchoring devices and scour-protection materials associated with offshore facilities for production of wind energy may also alter natural benthic environments and result in a decrease in benthic communities.[91]

Power generated by offshore wind farms must be delivered to shore. This typically involves a series of cables buried under the seafloor. Each individual turbine is connected to an electric service platform which then delivers the electricity to a substation on land through a buried

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[83] MINERALS MANAGEMENT SERVICE, RENEWABLE ENERGY AND ALTERNATE USE PROGRAM, TECHNOLOGY WHITE PAPER ON WIND ENERGY POTENTIAL ON THE U.S. OUTER CONTINENTAL SHELF 3 (2006), *available at* http://ocsenergy.anl.gov/documents/docs/OCS_EIS_WhitePaper_Wind.pdf.

[84] *Id.* at 5.

[85] Programmatic Alternative Energy EIS, *supra* note 79, 3-9. *See also*, ENVIRONMENTAL LAW INSTITUTE, VIRGINIA OFFSHORE ENERGY DEVELOPMENT LAW AND POLICY REVIEW AND RECOMMENDATIONS (2008).

[86] ENVIRONMENTAL LAW INSTITUTE, VIRGINIA OFFSHORE ENERGY DEVELOPMENT LAW AND POLICY REVIEW AND RECOMMENDATIONS 6 (2008).

[87] *Id.* at 8.

[88] *Id.* at 9.

[89] Alternative Energy Programmatic EIS, *supra* note 79, at 3-9.

[90] Wind Energy White Paper, *supra* note 83, at 11.

[91] *Id.* at 12.

cable.[92] These cables have to be buried under the seafloor to avoid damage that could be caused by anchors or fishing equipment if the cable were placed directly on the sea floor. Cables are typically buried using a technique called cable-jetting, which places the cable in a trench that is 8 feet deep and 4 to 6 feet wide.[93]

b) Offshore Wave Energy

Another alternative energy source is offshore wave energy. Wave energy conversion technologies are still in the development phase but can create electricity by capturing the energy from the up-and-down motion of waves in the ocean. There are four main technologies in development to be used to capture wave energy: point absorbers, attenuators, overtopping devices, and terminators. Each type of technology varies in size and configuration so the environmental impacts will vary depending on the technology used and the location. All four types of wave energy conversion technology will have to be moored, anchored or attached to the sea floor in some way and this is likely to have some impact on benthic habitat and communities. Additionally, transmission cables will be necessary to deliver the electricity to shore and the burying or laying of the cables could result in disturbance of benthic habitat or communities.[94]

c) Ocean Current Energy

Ocean current energy is another type of offshore energy production that is in the early stages of development. This technology uses submerged turbines on either a horizontal or vertical axis. These underwater turbines have blades connected to a generator to convert the rotational energy from the spinning blades into electricity. They are similar to wind turbines, using blades to capture the kinetic energy of the moving water (instead of wind).[95] There are several different approaches to collecting ocean current energy that range from turbines that look very similar to wind turbines to barges with water-filled parachutes. The turbines will have to be anchored or attached to the seafloor in some way and the electricity will have to be delivered to land using undersea cables. Several prototypes and small scale models of these turbines are currently being tested but none are hooked up to an electrical grid operating on a commercial scale. The environmental impacts of ocean current energy will depend on the technologies that turn out to be the most economically viable and are used commercially.[96]

d) Transmission of Offshore Energy

When energy is produced offshore it must be transported back to shore to be used, unless it is intended to be used offshore. As discussed in previous sections, electricity is likely to be transmitted from offshore wind farms to shore using submarine cables but current applications only require transport over relatively short distances. The use of submarine cables to transmit

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[92] ELI, *supra* note 86, at 9.
[93] *Id.* at 10.
[94] *See, e.g., id.* at 17.
[95] Alternative Energy Programmatic EIS, *supra* note 79, at 3-14.
[96] *Id.*

electricity long distances, like from a source that is on the outer continental shelf, presents some technical challenges. The use of these cables also has potential environmental implications, including disturbance of the seafloor and electromagnetic radiation.[97]

Methods of using hydrogen to store and transport the energy generated at offshore facilities are also being considered and developed. This is accomplished by delivering hydrogen to shore in gas liquid or hydrogen carrier form. The technology for gaseous and liquefied hydrogen is well established. The use of liquid hydrogen is expensive and complex and not a viable option. The use of gaseous hydrogen would involve transporting it to shore through a pipeline, or by ship. The technology for using hydrogen carriers is still being researched and there is no existing commercial process currently available. This process would involve either: using a two-way carrier substance that would be charged with hydrogen at the offshore facility, sent to shore, stripped of the hydrogen and sent back to the offshore facility; or using a one-way carrier that would be charged with hydrogen offshore sent to shore and decomposed at the point where the hydrogen is to be used. Carrier hydrogen could be transported to shore using pipelines, tankers or ships depending on the carrier substance. As with submarine cables and any other undersea pipelines there are potential environmental impacts to benthic habitat and communities associated with using pipelines to transport the hydrogen from the offshore facilities.[98]

3. Other Activities in Ocean Waters

There are also other non-energy related activities in waters beyond three nm that could potentially fall within the USACE's reach if the territorial sea definition was updated. These activities include: extraction of mineral resources for purposes other than energy production (like sand or gravel); offshore aquaculture; offshore infrastructure (cables, pipelines, ocean outfall or intake pipes, communication or signal towers, and navigation aids); salvage operations (treasure hunting, archaeological exploration, or commercial salvage); underwater transportation tunnels; discharge of dredged material; dredging activities for shipping channels or beach re-nourishment; and reef creation (creation of new artificial reefs or creation of reefs for restoration or mitigation).

4. Importance of § 404 Jurisdiction

Many of the activities discussed above will occur far from shore, in deep waters and go unseen by many. Though the impacts associated with these activities (some of which could amount to deposit of dredged or fill material) may not be as readily observable in the vastness of ocean waters, the deposit of dredged or fill material associated with these activities could be just as detrimental to the marine environment as it is to ecosystems more closely connected to land. Given the recent political attention and celebrity surrounding alternative energy sources, the vastness of offshore waters, and the production potential for alternative energy sources in offshore waters, and the potential environmental benefit of offshore energy sources, activities exploiting alternative offshore energy sources have the potential to come before the relevant administrative agency with a presumption of "greenness" or overall environmental benefit. Additionally, offshore technology,

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[97] OCS Alternative Energy and Alternative Use Programmatic EIS Information Center, Hydrogen Generation, http://ocsenergy.anl.gov/guide/hydrogen/index.cfm.
[98] *Id.*

especially the development of alternative energy sources in offshore waters, is a relatively new yet rapidly growing industry, and the potential adverse impacts of these technologies are difficult to predict and assess.[99] Thus, substantive analysis of the potential environmental impacts of these activities (individually and cumulatively) is of paramount importance, regardless of whether or not these activities are already regulated under some authority. It is important that the impacts and effects of these activities undergo sufficient scrutiny to ensure that potential environmental consequences are not overshadowed by the environmentally beneficial intent of the technologies.

V. Regulation of Offshore Activities under other Domestic Laws

While the geographic scope of § 404 is limited beyond 3 nm, there is a wide array of statutes and regulatory programs that may provide oversight beyond three miles from shore of the activities discussed. These activities may be subject to the jurisdiction of a particular federal statute based on the type of activity that is occurring (like transport of dredged material or production of oil and gas), or activities may be regulated by other statutes based on their potential to impact specific natural resources (like endangered species). The territorial sea definitions in these federal statutes, however, raise similar jurisdictional questions.

A. Marine Protection Research and Sanctuaries Act (Title I: Ocean Dumping Act)

Title I of the Marine Protection Research and Sanctuaries Act (MPRSA), known as the Ocean Dumping Act (ODA), prohibits the transport of "any material for the purpose of dumping it into ocean waters" unless it is authorized by a permit issued by the EPA or the USACE.[100] This prohibition includes any material transported from the United States, and any material transported (from any location) by aircraft or vessel registered in the United States or flying a U.S. flag.[101] Ocean waters include "those waters of the open seas lying seaward of the baseline from which the territorial sea is measured, as provided for in the Convention on the Territorial Sea and the Contiguous Zone (15 UST 1606; TIAS 5639)."[102] While this language implies a 3-nm territorial sea, this Convention is only referred to as a means of establishing the baseline from which the "ocean waters" will be measured. The EPA interprets "ocean waters" to "include the waters of the territorial sea, the contiguous zone and the oceans as defined in [CWA §502]."[103] The prohibition on the dumping of material from the United States or by an U.S. aircraft or vessel, therefore, applies to all waters seaward of the baseline to the extent of U.S. jurisdiction.

The MPRSA also prohibits the unpermitted dumping of "any material transported from a location outside the United States (1) into the territorial sea of the United States, or (2) into a zone contiguous to the territorial sea of the United States, extending to a line twelve nautical miles seaward from the baseline from which the breadth of the territorial sea is measured, to the extent

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[99] Alternative Energy Programmatic EIS, *supra* note 79, at ES-1.
[100] 33 U.S.C. § 1411(a).
[101] *Id.*
[102] 33 U.S.C. § 1402(b).
[103] 40 C.F.R. § 220.2(c).

that it may affect the territorial sea or the territory of the United States."[104] The MPRSA does not include a definition of territorial sea.

The MPRSA essentially creates two permitting programs. Under § 103 of the MPRSA, the USACE is authorized to issue permits "for the transportation of dredged material for the purpose of dumping it into ocean waters, where the Secretary determines that the dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities."[105] Dredged material includes "any material excavated or dredged from navigable waters of the United States."[106] The EPA is authorized, under § 102, to issue permits for the transport of material, other than dredged materials, for the purpose of dumping it into ocean waters.[107]

Upon passage of the MPRSA, the EPA was tasked with developing criteria for reviewing and evaluating ocean dumping permits.[108] In making its determination of whether the ocean dumping of dredged material will "unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities," the USACE must apply the EPA's criteria.[109] This is similar to the CWA's § 404 permitting structure, which requires the USACE to apply the EPA's § 404(b)(1) guidelines when reviewing dredge and fill permits. The § 404(b)(1) guidelines apply to the USACE's review of proposed discharged of dredged and fill permits into navigable waters lying inside the baseline from which the territorial sea is measured (internal waters, i.e. freshwater and estuaries) and the discharge of fill material into the territorial sea.[110] When reviewing proposed discharges of dredged material into the territorial sea, the Corps must apply the EPA's ocean dumping criteria. The distinction does not have must practical effect, however, as the EPA's § 404(b)(1) guidelines and its ocean dumping criteria are almost identical.

B. Outer Continental Shelf Lands Act

Most of the activities associated with offshore energy that occur beyond three miles from shore are regulated under the Outer Continental Shelf Lands Act (OCSLA). Through the OCSLA, Congress asserted jurisdiction, control, and power of disposition over the seabed and subsoil of the outer Continental Shelf.[111] Under OCSLA, the outer continental shelf (OCS) is "held by the Federal Government for the public" and "should be made available for expeditious and orderly development, subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs."[112] The OCSLA treats the waters above the outer continental shelf as the high seas; OCSLA does not affect the rights of other nations to navigate and fish in the waters over the outer continental shelf.[113] The OCS is defined as "all

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[104] 33 U.S.C. § 1411(b).
[105] *Id.* § 1413(a).
[106] 33 C.F.R. § 324.2.
[107] 33 U.S.C. § 1412(a).
[108] *Id.*
[109] *See id.* § 1413(b). *See also*, 33 C.F.R. § 324.4(c).
[110] 40 C.F.R. § 230.2(b).
[111] 43 U.S.C. § 1332.
[112] *Id.* § 1332(3).
[113] *Id.* § 1332(2).

submerged lands lying seaward and outside of the area of lands beneath navigable waters as defined in section 2 of the Submerged Lands Act (Public Law 31, Eighty-third Congress, first session) [43 U.S.C. § 1301], and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control."[114] In general, lands beneath navigable waters include internal waters and tidal waters "seaward to a line three geographical miles distant from the coast line."[115]

Under the OCSLA, the Department of the Interior has jurisdiction over most of the activities that occur on the outer Continental Shelf. This includes regulating the exploration and production of natural resources (oil, natural gas, and non-energy minerals) on the OCS through planning, issuance of permits, and the grant of leases, easements, and rights-of-way.[116] The Department of the Interior delegated authority over OCS leases to the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE).[117] BOEMRE also has the authority to grant leases, easements, and rights-of-way for activities on the OCS associated with production and transmission of energy from sources other than oil and gas, and for alternate uses of existing structures on the OCS.[118]

The lease of areas of the OCS for exploration and production of oil and natural gas involves several steps including: lease planning, lease sale, exploration and production. The environmental impacts of the activities that will take place during the exploration and production of oil and gas are considered throughout the lease process.[119] This includes consideration of environmental values of the natural resources in the area, its environmental sensitivity and ecological characteristics as well as a balancing of the potential environmental damage with other factors.[120] The BOEMRE conducts a study of the area to assess and manage impacts to the marine and coastal environments before a lease is sold.[121] During exploration the lessee is required to submit information regarding onsite flora and fauna (including endangered species and critical habitat), environmentally sensitive areas, and direct and cumulative impacts of the activities.[122]

The BOEMRE also grants rights-of-way for pipelines to transport oil, natural gas, or other minerals from the OCS to land. In granting such rights-of-way, the BOEMRE must "assur[e] maximum environmental protection by utilization of the best available and safest technologies, including the safest practices for pipeline burial."[123]

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[114] *Id.* § 1331(1).
[115] *Id.* § 1301(a).
[116] JORDAN DIAMOND ET AL., MARINE SPATIAL PLANNING IN U.S. WATERS: AN ASSESSMENT AND ANALYSIS OF EXISTING LEGAL MECHANISMS, ANTICIPATED BARRIERS, AND FUTURE OPPORTUNITIES 18 (Environmental Law Institute 2009).
[117] *Id.* at 18
[118] JAMES MCELFISH ET AL., MARYLAND OFFSHORE ENERGY FRAMEWORK 6 (Environmental Law Institute 2009)
[119] Diamond, *supra* note 116, at 19.
[120] *Id.*
[121] *Id.* at 20.
[122] *Id.*
[123] 43 U.S.C. § 1334(e). *See also*, Diamond, *supra* note 116, at 21.

C. *Rivers and Harbors Act*

Under § 10 of the Rivers and Harbors Act (RHA) the USACE issues permits for "structures and/or work in or affecting navigable waters of the United States."[124] The definition of "navigable waters of the United States" under § 10 of the RHA includes "all ocean and coastal waters within a zone three geographic (nautical) miles seaward from the baseline."[125] For certain activities the USACE's jurisdiction under § 10 of the RHA was extended to the OCS by OCSLA.[126] According to USACE regulations, § 4(f) of the OCSLA extended the geographic jurisdiction of the USACE to "prevent obstruction to navigation" under § 10 of the RHA beyond the territorial sea to the "seaward limit of the outer continental shelf."[127] A § 10 permit from the USACE is therefore required for "the construction of artificial islands, installations, and other devices on the seabed."[128] The activities that fall under this extension of the USACE's jurisdiction "are subject to the standard permit procedures of [the Rivers and Harbors Act]."[129]

USACE regulations define "structure" to "include without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other obstacle or obstruction."[130] "Work" is defined as "includ[ing] without limitation, any dredging or disposal of dredged material, excavation, filling, or other modification of a navigable water of the United States."

D. *Magnuson-Stevens Fishery Conservation and Management Act*

Activities occurring more than three miles from shore may also be regulated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA regulates and manages fisheries in federal waters from the seaward boundary of the adjacent state's waters out to the seaward extent of the Exclusive Economic Zone (200 miles from shore). This includes the creation of regional fishery management councils to develop, implement, and manage fishery management plans within their region.[131]

The MSA also seeks to protect essential fish habitat (EFH) from the impacts of fishing as well as other activities that occur in ocean waters. The regional councils designate EFH for each fishery that they manage and include provisions in the fishery management plan for the minimization of adverse impacts, as well as the conservation and enhancement of EFH.[132] EFH includes the water column as well as the seafloor.[133] To protect EFH, the MSA requires federal agencies to "consult with the Secretary [NOAA] with respect to any action authorized, funded, or undertaken, or

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[124] 33 C.F.R. § 322.3(a).
[125] *Id.* § 329.12(a).
[126] 43 U.S.C. § 1333(e).
[127] *Id.* § 320.2(b).
[128] *Id.* § 322.3(b).
[129] *Id.* § 322.5(f).
[130] *Id.* § 322.2(b).
[131] *See, eg.,* Appendix 6 of an Ocean Blueprint, *supra* note 11, at 29-31.
[132] *Id.* at 33.
[133] McElfish, supra note 118, at 20.

proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat."[134] If activities that occur beyond three miles from shore also fell under the regulatory jurisdiction of § 404, the consultation requirement under the MSA could also be triggered if they could affect essential fish habitat.

E. Endangered Species Act

Under § 9 of the ESA the "take" of endangered species is prohibited.[135] The "take" prohibited by the ESA includes intentional activities with direct impacts on an individual of a given endangered species[136] as well as activities that kill or injure endangered species by significantly modifying their habitat.[137] Additionally, federal agencies are required to consult with NOAA Fisheries or the U.S. Fish and Wildlife Service to "insure that any action authorized, funded, or carried out by such agency … is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined … to be critical."[138]

F. Marine Mammal Protection Act

The Marine Mammal Protection Action (MMPA) was passed to protect marine mammals by ensuring that optimum populations are maintained. To accomplish this purpose the MMPA prohibits the "take" of marine mammals. The MMPA defines "take" as: "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."[139] The take prohibition includes a prohibition of harassment of marine mammals which is defined broadly to encompass activities that have the potential to injure or disturb ("by causing disruption of behavioral patterns") marine mammals or marine mammal stocks in the wild.[140] Many of the activities that occur beyond three miles from shore could be directly regulated under the MMPA because of the broad definition of "take" and the equally broad assertion of regulatory jurisdiction to prohibit the take of marine mammals.[141]

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[134] 16 U.S.C. § 1855(b)(2); *see also*, Appendix 6 of An Ocean Blueprint, *supra* note 11, at 33-34.
[135] 16 U.S.C. § 1538(a).
[136] *See id.* § 1532(19) (stating that: "[t]he term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.").
[137] Appendix 6 of An Ocean Blueprint, *supra* note 11, at 38 (citing Sweet Home v. Babbitt, 515 U.S. 687 (1995)).
[138] 33 U.S.C. § 1536(a)(2); *see also*, Appendix 6 of An Ocean Blueprint, *supra* note 11, at 39.
[139] 16 U.S.C. § 1362(13).
[140] *Id.* § 1362(18)(a).
[141] *Id.* § 1372(a) (making it unlawful for: "any person … or any vessel or other conveyance subject to the jurisdiction of the United States to take any marine mammal on the high seas" and "any person or vessel or other conveyance to take any marine mammal in waters or on lands under the jurisdiction of the United States.").

G. *Other Laws*

There are several other laws that may impose requirements on those wishing to engage in activities that occur beyond three miles from shore and may otherwise fall under the regulatory jurisdiction of § 404 of the CWA. Those statutes include but are not limited to: the Atomic Energy Act, the Natural Gas Act, the Submerged Lands Act, the Federal Power Act, the Coastal Zone Management Act, the National Marine Sanctuaries Act, the American Antiquities Act, the Ports and Waterways Safety Act, the Deep Water Port Act, the Deep Seabed Hard Mineral Resources Act, the Oil Pollution Act and the Ocean Thermal Energy Conversion Act.

VI. "Value Added" by Extending § 404 Beyond 3 Nautical Miles

It would be futile to update the definition of the territorial seas in the CWA solely for the sake of consistency with international law. In addition to the territorial seas, the CWA uses outdated definitions to establish other geographic boundaries in ocean and coastal waters. As discussed earlier, the contiguous zone used in the CWA is inconsistent with the contiguous zone claimed by the United States under international law, and it is defined in the CWA by reference to an outdated source of international law. Thus from the standpoint of eloquence it would be better to update and re-define all of the outdated jurisdictional terms used in the CWA to make them consistent with the boundaries claimed by the U.S. under international law. This may require a significant regulatory overhaul. The benefits of updating and re-defining just the territorial sea in the CWA are could be significant, however, in terms of the additional environmental protection that might be provided by the extended jurisdiction of the USACE under § 404 of the CWA.

Many of the activities that occur beyond three miles from shore, and may otherwise fall under the regulatory jurisdiction of § 404 of the CWA, are regulated under at least one of the authorities discussed above. Most of the regulatory programs discussed include an assessment of the environmental impacts of the regulated activity and avoidance or mitigation of potential environmental impacts. This, however, does not mean that it would be superfluous to update the definition of the territorial sea in the CWA and thereby extend the regulatory jurisdiction of the USACE under § 404 to twelve nautical miles. Extending the regulatory jurisdiction of the USACE under § 404 could benefit the marine environment and advance the fulfillment the CWA's purpose to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[142] by increasing the likelihood that the unintended environmental impacts (of activities occurring between three and twelve miles from shore) will be discovered and addressed before they occur.

There are several ways that the § 404 permit application review and approval process might increase the likelihood that unintended environmental impacts of these activities would be recognized and addressed before they occur. First, an extension of the USACE's regulatory jurisdiction under § 404 may capture activities that would not otherwise be subject to any regulatory oversight, thereby ensuring that the environmental impacts of those potentially unregulated activities are sufficiently scrutinized under the § 404 permit application and approval process.

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[142] 33 U.S.C. § 1251(a).

Extending the seaward reach of the geographic jurisdiction of § 404 may also trigger NEPA review of certain activities for which it may not otherwise be required. This would add another layer of scrutiny, which involves a broad assessment of the potential environmental impacts of the proposed activity. The requirement of consultation with other federal or state agencies may also be triggered, which would serve as yet another layer of scrutiny focused on environmental impacts and conducted by a different agency. This could uncover potential adverse environmental impacts that are beyond the relevant regulatory agencies' area of expertise or scope of authority, or may otherwise go overlooked by other agencies.

Finally, the § 404 permit application review and approval process itself would serve as an additional, distinct layer of environmental scrutiny, giving the USACE the opportunity to directly analyze potential environmental impacts associated with the activity. Through the § 404 permit application, review, and approval process the activities would be evaluated for a different purpose, and the potential environmental impacts of these activities would be analyzed based on an independent set of criteria.

Given the activities that currently occur in offshore waters, the increasing political and societal popularity of alternative energy sources, and the potential for significant expansion of the activities occurring in offshore waters, the additional layers of scrutiny provided by extending the seaward reach of the geographic jurisdiction of § 404 has the potential to be beneficial to the marine environment. However, that does not mean that extending the environmental protections provided by § 404 of the CWA to the full extent of the territorial sea currently claimed by the United States is the ideal means of protecting the marine environment and regulating the activities that occur beyond three miles from shore. The earlier discussion of the wide array of authorities regulating activities in offshore waters elucidates the fragmented state of the current regulatory structure for the activities that occur in offshore waters. Additionally, many of the activities discussed are not limited to ocean waters within twelve nautical miles of shore. The use of an outdated definition of the territorial seas in the CWA brings to light a much bigger issue; that there is a need for regulatory oversight in ocean waters to catch up with the rapidly developing technologies that have already allowed civilization to reach further and further into the ocean waters. Short of a complete regulatory overhaul, updating the definition of the territorial seas in the CWA, however, could help to prevent the regulation of activities in ocean waters from falling too far behind.

The outdated definition of the territorial seas in the CWA presents an interesting semantic issue that raises some complex questions about the sufficiency of regulatory oversight in ocean waters within the sovereignty and jurisdiction of the United States. Given the use of outdated definitions to establish other geographic boundaries in the CWA, updating the definition of the territorial sea for definitional consistency alone would be inconsequential. Also, simply adding another permit to the list of approvals needed to conduct activities in ocean waters would add to the fragmented nature of current regulatory oversight in ocean and coastal waters and thereby unnecessarily complicate and delay the approval process. This could interfere with the ability of U.S. industries to keep up with technological advancements in the global market.

Reconciling the definition used in the CWA with the territorial seas claimed by the United States in international law would clearly increase the geographic area in which the USACE can exercise its regulatory authority under § 404 of the CWA. This could also provide an additional layer of scrutiny for current and future activities that have the potential to negatively impact the

chemical, physical, or biological integrity of the Nation's waters beyond three nm from shore and would further the CWA's purpose to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

The limitation placed on USACE's jurisdiction under § 404 by the outdated definition of the territorial sea does not create an egregious regulatory gap. Despite the lack of practical implications, the outdated definition of the territorial seas used in the CWA does point out the need to re-evaluate the current regulatory framework used by the United States to oversee activities in ocean and coastal waters. There is a need for a regulatory system that is able to keep up with the rapidly developing technologies that are taking place further from shore in order to provide effective regulatory oversight to prevent irreparable harm to the natural resources in ocean waters without interfering with the ability of the United States to keep up with the rest of the world by unduly burdening the permitting process or preventing the United States from taking advantage of the natural resources at our disposal in ocean waters.