

**WETLANDS OR SEAWALLS? ADAPTING SHORELINE
REGULATION TO ADDRESS SEA LEVEL RISE AND
WETLAND PRESERVATION IN THE GULF OF MEXICO***

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* This research was funded under award number NA10OAR4170078 from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect the views of NOAA or the U.S. Department of Commerce.

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I. INTRODUCTION

Shorelines, in their natural state, are continuously evolving environments shaping the ever-important interface between land and water. For centuries, shorelines have provided people with ways of access and transportation, places to fish, and areas to swim and recreate. Dating back to Roman times, the public's interest in access to that land-water interface has been recognized in property law.¹

However, public access to the shoreline finds itself increasingly pitted against upland property owners' efforts to maintain a static demarcation of their property lines. That is, waterfront property owners, in hopes of beating back erosion and rising seas, are frequently erecting hard structures along the water's edge. In the last century, population pressures along the U.S. coastline have exploded, intensifying development pressures in environmentally sensitive areas.² As development expands, so does the desire of property owners to protect their investment. Facing coastal storms and sea level rise, developers and waterfront property owners are placing greater pressures on state and local governments for permission to armor the shore. In the case of beaches, public expenditures for beach restoration have escalated.³ Efforts to beat back the sea have intensified, but at what cost?

As more and more of the nation's bays and estuaries are armored, the American public is losing important habitat, ecosystem services, and the tradition of public access to the shoreline. Rather than marshy wetlands and sandy beaches along which the public has enjoyed access since the country's founding, the water's edge is increasingly converted to seas abutting bulkheads and seawalls, which cause the wet beach to essentially wash away. In 2007, the National Research Council released *Mitigating Shore Erosion Along Sheltered Coast*, a report that looks at the challenges of addressing shoreline erosion along sheltered coastlines, such as bays and estuaries.⁴ The report draws attention to cumulative impacts of shoreline armoring and the need for a new regulatory approach

1. See James G. Wilkins & Michael Wascom, *The Public Trust Doctrine in Louisiana*, 52 LA. L. REV. 861, 863 (1992) ("Under Roman law the sea and seashore, the air, and running water were common things.").

2. M.S. Peterson et al., *Habitat Use by Early Life-History Stages of Fishes and Crustaceans Along a Changing Estuarine Landscape: Differences Between Natural and Altered Shoreline Sites*, 8 WETLANDS ECOLOGY & MGMT. 209, 209 (2000).

3. See generally *Beach Nourishment*, W. CAROLINA UNIV., <http://www.wcu.edu/1038.asp> (last visited May 9, 2011) (providing a comprehensive compilation of beach renourishment in the United States, including cost).

4. NAT'L RESEARCH COUNCIL, *MITIGATING SHORE EROSION ALONG SHELTERED COASTS* 1 (2007).

for lower-energy shores.⁵ And unfortunately, as climate change impacts intensify over the next century, so will the loss of shoreline through rising seas.

For these reasons, addressing climate change requires a new approach to shoreline regulation. Even modest projections show that sea level rise is likely to have a substantial impact on coastal communities along the Gulf of Mexico.⁶ As sea level rise accelerates and storm intensity increases, state and local governments must reevaluate their existing framework for shoreline management. Traditional approaches to defend or armor the shoreline against the rising sea do not take into account loss of estuarine habitat and ecosystem services provided by wetlands.⁷ By 2004, national wetland habitat had dropped over 50%, falling from historic levels of 220 million acres to 107 million acres.⁸ These wetlands provide essential habitats for a wide range of animals including birds, fish, and the economically significant Gulf shrimp as well as invaluable ecosystem services like protection from storm surge.⁹ Almost 70% of commercial fishery species in the United States depend on near-shore habitat “at some time during life.”¹⁰ The potential loss of these areas as a result of the combined effect of sea level rise and armoring could cost Gulf of Mexico fisheries staggering amounts of money.

As shorelines encroach upon the built environment over the next century, coastal communities face a difficult decision—retreat inland or defend against rising seas. Further complicating this decision is the need to balance the public’s interest in the water’s edge with waterfront property owners’ interest in safeguarding their investment. In response, some governments are increasingly limiting waterfront property owners’ right to armor their waterfront property in favor of preserving the natural shoreline.¹¹ Unsurprisingly, this approach finds no favor with waterfront property owners who raise the specter of regulatory takings challenges. The potential for takings lawsuits has slowed government willingness to limit hard structures along the shore.

5. *See id.* at 3-5.

6. *See* E.A. PENDLETON ET AL., U.S. GEOLOGICAL SURVEY, COASTAL VULNERABILITY ASSESSMENT OF THE NORTHERN GULF OF MEXICO TO SEA-LEVEL RISE AND COASTAL CHANGE 1 (2010), available at <http://pubs.usgs.gov/of/2010/1146/pdf/ofr2010-1146.pdf>.

7. *See* NAT’L RESEARCH COUNCIL, *supra* note 4, at 4.

8. T.E. DAHL, U.S. FISH & WILDLIFE SERV., STATUS AND TRENDS OF WETLANDS IN THE CONTERMINOUS UNITED STATES 1998-2004 57 (2005).

9. LADON SWANN, THE USE OF LIVING SHORELINES TO MITIGATE THE EFFECTS OF STORM EVENTS ON DAUPHIN ISLAND, ALABAMA USA, 1 (2008).

10. Peterson et al., *supra* note 2, at 209.

11. *See* Strategies for Wetland Preservation: Living Shorelines, *infra* section II.C.

This Article examines the conundrum of shoreline regulation in the face of increasing sea level rise in the Gulf of Mexico and the need for wetland preservation. The Article will first examine the challenges of sea level rise and the current options for coastal communities. This Section will explore the traditional approach of shoreline armoring and consider an alternative: living shorelines. The Article next turns to the legal dynamic facing managers when determining appropriate shoreline regulations, particularly the need to balance the state's obligations under the public trust doctrine with private property owners' claims under the takings clause of the Fifth Amendment. Finally, the Article suggests recommendations for resolving the conflict between public and private interest along bay and estuary shorelines.

II. SEA LEVEL RISE AND SHORELINE MANAGEMENT

While political debate over climate change continues in the United States, the scientific community has reached consensus on the matter—climate change is occurring and impacts are expected to increase.¹² As defined by the Intergovernmental Panel on Climate Change (IPCC) (the leading international scientific body for assessing climate change), climate change

refers to a change in the state of the climate that can be identified . . . by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity.¹³

The IPCC goes on to conclude that “[w]arming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level.”¹⁴ Regardless of one's beliefs about the origins of climate change, the impacts are demonstrable. Coastal communities ignore the rising seas at their own peril.

12. Naomi Oreskes, *Beyond the Ivory Tower: The Scientific Consensus on Climate Change*, 306 SCI. 1686 (2004); See also William R. L. Anderegg et al., *Expert Credibility in Climate Change*, 107 PROC. NAT'L ACAD. SCI. USA 12107, 12107-12109 (2010).

13. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 30 (Abdelkader Allali et al. eds., 2007) [hereinafter SYNTHESIS REPORT], available at http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

14. *Id.*

A. Sea Level Rise & the Gulf of Mexico

In 2007, the IPCC released its most recent report—the Fourth Assessment. According to the Fourth Assessment Report, global average surface temperature has risen 0.74° Celsius (1.3° Fahrenheit) over the last century (1906-2005).¹⁵ The rate of Arctic temperature increase is almost double that of the global average.¹⁶ Warming temperatures have led to corresponding increases in sea level rise.¹⁷ The Fourth Assessment Report concluded that between 1961 and 2003, sea levels rose at an average rate of 1.8 millimeters per year, resulting in a moderate increase of 0.17 meters over the last century.¹⁸ Over the next 100 years, the Report projects less than one meter of average sea level rise.¹⁹ However, since the release of the Fourth Assessment Report, other researchers have suggested that the IPCC's sea level rise estimates are too conservative and could be as high as 1.4 meters by 2100.²⁰ The IPCC is currently preparing its Fifth Assessment with an anticipated release date of early 2015²¹ and will include updated sea level rise projections.²²

In addition to the IPCC's analysis of sea level rise, U.S. federal agencies are also tracking sea level rise with particular emphasis on domestic variability. For instance, the U.S. Army Corps of Engineers,²³ the National Oceanic and Atmospheric Administration²⁴ (NOAA), the U.S. Geological Survey²⁵ (USGS), and the Environ-

15. *Id.*

16. *Id.*

17. *Id.*

18. *Id.*; see also CHRIS WOLD ET AL., CLIMATE CHANGE AND THE LAW 20 (2009) (discussing impacts of accelerated melting arctic ice).

19. WOLD, *supra* note 18, at 20.

20. *Id.*; see Susan Solomon et al., *A Closer Look at the IPCC Report*, 319 SCIENCE 409, 409-10 (2008).

21. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SCOPE, CONTENT AND PROCESS FOR THE PREPARATION OF THE SYNTHESIS REPORT (SYR) OF THE IPCC FIFTH ASSESSMENT REPORT (AR5) 6 (2010), available at http://www.ipcc.ch/meetings/session32/syr_final_scoping_document.pdf.

22. *Agreed Reference Material for the IPCC Fifth Assessment Report*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, <http://www.ipcc.ch/pdf/ar5/ar5-outline-compilation.pdf> (indicating that chapter 13 of the fifth assessment report will contain updated sea level rise projections).

23. U.S. ARMY CORPS OF ENG'RS, CIRCULAR NO. 1165-2-211, WATER RESOURCE POLICIES AND AUTHORITIES INCORPORATING SEA-LEVEL CHANGE CONSIDERATIONS IN CIVIL WORKS PROGRAMS (2009).

24. See *Sea Level Trends*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., <http://tidesandcurrents.noaa.gov/sltrends/sltrends.shtml> (last visited May 9, 2011).

25. See E. Robert Thieler et al., *National Assessment of Coastal Vulnerability to Sea-Level Rise*, U.S. GEOLOGICAL SURVEY, <http://woodshole.er.usgs.gov/project-pages/cvi/> (last visited May 9, 2011).

mental Protection Agency²⁶ (EPA) are all working to analyze U.S. sea level rise impacts and ways to best address those impacts. The EPA first released sea level rise projections in 1983 and has continued to update projections since that time.²⁷ James G. Titus, of the EPA, has long called for sea level rise planning.²⁸

In 2000, the U.S. Geological Survey conducted an assessment of the Gulf of Mexico's vulnerability to sea level rise.²⁹ Therein, the authors noted that the Gulf of Mexico shoreline is predominately composed of barrier islands, lagoons, marshes, and deltas, making the shoreline an overall high-risk area for sea level rise.³⁰ The authors found that areas around New Orleans, Louisiana, were particularly susceptible to sea level rise while portions of Florida were more modestly impacted.³¹ In 2010, building upon the original Gulf of Mexico assessment, the USGS conducted a northern Gulf of Mexico assessment, targeting the areas from Galveston, Texas to Panama City, Florida.³² In conducting the assessment, the authors considered the impacts of six variables on coastal response to sea level rise: geomorphology, historical shoreline change rate, regional coastal slope, relative sea level change, mean significant wave height, and mean tidal range.³³ After considering all the factors, the researchers found that areas of the Louisiana coast and the Mississippi barrier islands were at greatest risk to sea level rise along the Northern Gulf of Mexico.³⁴

Although the exact rates of sea level rise are uncertain, potential coastal impacts include: "shoreline erosion, storm-surge flooding, saltwater intrusion into groundwater aquifers, inundation of wetlands and estuaries, and threats to cultural and historic re-

26. See *Sea Level Rise Reports*, ENVTL. PROT. AGENCY, <http://epa.gov/climatechange/effects/coastal/slrreports.html> (last visited May 9, 2011) (listing all EPA SLR reports).

27. U.S. ENVTL. PROT. AGENCY, EPA 230-R-95-008, *THE PROBABILITY OF SEA LEVEL RISE 139* (1995); see also James G. Titus, *Does the U.S. Government Realize that the Sea is Rising? How to Restructure Federal Programs so that Wetlands and Beaches Survive*, 30 GOLDEN GATE U. L. REV. 717, 724-725 (2000) (discussing EPA and IPCC projected sea level rise) [hereinafter *The Sea is Rising*].

28. See James G. Titus, *Planning for Sea Level Rise Before and After a Coastal Disaster*, in *GREENHOUSE EFFECT AND SEA LEVEL RISE: A CHALLENGE FOR THIS GENERATION* (Michael C. Barth & James G. Titus eds., 1984) [hereinafter *Planning for Sea Level Rise*], available at <http://epa.gov/climatechange/effects/coastal/SLRChallenge.html>.

29. E. ROBERT THIELER & ERIKA S. HAMMAR-KLOSE, NATIONAL ASSESSMENT OF COASTAL VULNERABILITY TO SEA-LEVEL RISE: PRELIMINARY RESULTS FOR THE U.S. GULF OF MEXICO COAST (1999), available at <http://pubs.usgs.gov/of/2000/of00-179/index.html> (last modified Aug. 15, 2006).

30. *Id.* at *Discussion*.

31. *Id.*

32. PENDLETON ET AL., *supra* note 6, at 1.

33. *Id.*

34. *Id.*; see also VIRGINIA R. BURKETT ET AL., U.S. GEOLOGICAL SURVEY, *SEA-LEVEL RISE AND SUBSIDENCE: IMPLICATIONS FOR FLOODING IN NEW ORLEANS, LOUISIANA 63* (2003), available at http://www.nwrc.usgs.gov/hurricane/katrina_rita/Sea-Level-Rise.pdf. (Most of New Orleans metro area is sinking relative to mean sea level).

sources as well as infrastructure.”³⁵ In spite of the well-documented risk the Gulf of Mexico shores face from sea level rise, coastal land use planning rarely takes these risks into account. For instance, a recent study of land use planning along the U.S. Atlantic Coast found that 60% of land susceptible to one meter of sea level rise is likely to be developed while less than 10% of the same area is reserved for conservation.³⁶ This continued development along the coast combined with rising seas threatens the survival of existing coastal wetlands by eliminating the valuable wetland habitat.³⁷

A new study released in late 2010 suggests that coastal wetlands are more sensitive to destruction by rising sea levels than previously thought.³⁸ Under a “rapid” sea level rise scenario, most coastal wetlands worldwide will disappear by the end of the twenty-first century.³⁹ Even under a conservative slow sea level rise projection, many wetlands will be lost, particularly those with low levels of sedimentation and low tidal ranges.⁴⁰ Resources and ecosystem services provided by coastal wetlands will face greater threats as “sea-level rise inundates wetlands.”⁴¹ Critical services provided by coastal wetlands include “absorbing energy from coastal storms, preserving shorelines, protecting human populations and infrastructure, supporting commercial seafood harvests, absorbing pollutants and serving as critical habitat for migratory bird populations.”⁴²

B. Adapting to Sea Level Rise

Essentially, policymakers are faced with two primary strategies for adapting to rising sea levels: defend or retreat.⁴³ That is, regulators may attempt to hold back the sea through a combination of walls and other hard structures along with land-elevating techniques like beach restoration.⁴⁴ The second option, retreat, in-

35. PENDLETON ET AL., *supra* note 6, at 1 (internal citation omitted).

36. J G Titus et al., *State and Local Governments Plan for Development of Most Land Vulnerable to Rising Sea Level Along the U.S. Atlantic Coast*, 4 ENVTL. RES. LETTERS 1, 1 (2009) [hereinafter *State and Local Governments Plan*].

37. *Id.*

38. See Matthew L. Kirwan et al., *Limits on the Adaptability of Coastal Marshes to Rising Sea Level*, 37 GEOPHYSICAL RES. LETTERS L23401 1 (2010).

39. *Id.*

40. *Id.* at 4.

41. *Many Coastal Wetlands Likely to Disappear This Century, Scientists Say*, SCI. DAILY (Dec. 3, 2010), <http://www.sciencedaily.com/releases/2010/12/101201134256.htm>.

42. *Id.*

43. *The Sea is Rising*, *supra* note 27, at 733.

44. *Id.*

volves abandonment of vulnerable areas as the sea encroaches.⁴⁵ While policy arguments can be made in support of either theory, the likely strategy will include a hybrid approach whereby certain areas are abandoned yet others are heavily defended.

1. Retreat

A retreat approach to sea level rise necessitates relocation of costly infrastructure further inland and therefore can be a difficult choice for local decision-makers.⁴⁶ Ideally, as sea levels rise, development and infrastructure move inland.⁴⁷ Although defense mechanisms historically dominated local government strategies, in more recent times some states have successfully begun incorporating retreat mechanisms into their shoreline management regime. For instance, in the Gulf of Mexico, Florida employs the use of setbacks while Texas law has historically recognized rolling easements along its Gulf-facing beaches (although a recent Texas Supreme Court decision is casting doubt on the continued success of rolling easements in Texas).⁴⁸ The following is a brief discussion of two retreat strategies currently in practice in the Gulf of Mexico.

a. Setbacks

Setbacks are a common approach to limiting development in vulnerable areas and refer to the practice of limiting development seaward of a “setback” line. Establishment of a setback can be based on a variety of factors such as erosion rates, elevation, and projections of future shoreline changes such as sea level rise.⁴⁹ Setbacks operate as a restriction on development and ideally prevent, or diminish, the costly construction of new development in high-risk areas.⁵⁰

Florida began incorporating setbacks into its shoreline management plan in 1970, with an initial fifty-foot setback for construction along sandy beaches.⁵¹ Under Florida’s Beach and Shore

45. *Id.* at 734.

46. *Planning for Sea Level Rise*, *supra* note 28; *State and Local Governments Plan*, *supra* note 36, at 2.

47. *The Sea is Rising*, *supra* note 27, at 734.

48. *See Severance v. Patterson*, No. 09-0387, 2010 WL 4371438, at *24 (Tex. Nov. 5, 2010) (Medina, J., dissenting) *reh’g granted* (Mar. 11, 2011).

49. James G. Titus, *Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches Without Hurting Property Owners*, 57 MD. L. REV. 1279, 1311 (1998) [hereinafter *Rising Seas*].

50. *The Sea is Rising*, *supra* note 27, at 736.

51. Thomas K. Ruppert, *Eroding Long-Term Prospects for Florida’s Beaches: Florida’s Coastal Construction Control Line Program*, 1 SEA GRANT L. & POL’Y J. 74 (2008) [hereinaf-

Preservation Act, counties set a Coastal Construction Control Line (CCCL) to limit development along Florida's beaches with the stated purpose of preserving and protecting beaches "from imprudent construction" which may, among other things, increase erosion, jeopardize adjacent properties, or limit public access.⁵² However, Florida's CCCL is, at best, a mixed success. Even with the CCCL Program in place, development of major structures, such as condominiums and resorts, in close proximity to the beach continues.⁵³ As others have noted, the CCCL suffers from a variety of problems including administrative challenges, difficulty with maintaining up to date CCCLs, use of variances, emergency permitting, and after the fact permitting.⁵⁴

b. Rolling Easements

To address the migratory nature of shorelines (and therefore the migration of the dry beach), Texas recognizes a rolling easement to preserve existing public access to Gulf-facing beaches.⁵⁵ In other words, where the state can prove a historic use of the dry beach, Texas law recognizes a public access easement that migrates (or "rolls") with the vegetation line.⁵⁶ In 1959, Texas enacted the Open Beaches Act, which recognized the public's right to access Gulf beaches and acknowledged Texas' common law history of applying a rolling public easement from the line of vegetation to the shore.⁵⁷ The Open Beaches Act embodies Texas' public policy of "free and unrestricted" access along publically owned beaches and to privately owned beaches where the public has acquired an easement.⁵⁸ The Act provides an enforcement mechanism for protecting public access rights to Texas beaches.⁵⁹ In 2009, Texas went a step further and incorporated the Open Beaches Act into the state constitution.⁶⁰ The Texas Constitution now includes a provision designed to protect the right of the public, individually

ter *Coastal Construction Control Line*]. Counties without an established CCCL continue to use the fifty foot setback. *Id.* at 74 n.76. See also FLA. STAT. §§ 161.052, 161.053(11) (2010).

52. FLA. STAT. § 161.053(1)(a) (establishing the CCCL but exempting existing sea walls and shoreline protection structures).

53. See THOMAS K. RUPPERT ET AL., *ERODING LONG-TERM PROSPECTS FOR FLORIDA'S BEACHES: FLORIDA'S COASTAL MANAGEMENT POLICY 67* (2008). See generally *Coastal Construction Control Line*, *supra* note 51.

54. *Coastal Construction Control Line*, *supra* note 51, at 84-94 (providing a detailed discussion of problems facing the CCCL Program).

55. *Severance v. Patterson*, No. 09-0387, 2010 WL 4371438, at *2 (Tex. Nov. 5, 2010) *reh'g granted* (Mar. 11, 2011).

56. *Id.*

57. See TEX. NAT. RES. CODE §§ 61.011-61.026 (2009).

58. *Id.* § 61.013; *Severance*, 2010 WL 4371438, at *3.

59. TEX. NAT. RES. CODE § 61.018.

60. TEX. CONST. art. 1, § 33.

and collectively, to access and use the public beaches bordering the seaward shore of the Gulf of Mexico.⁶¹ Building is prohibited in this area, including erection of fences.⁶²

However, enforcement of the rolling easement in Texas was challenged in recent litigation.⁶³ Though it began in federal court,⁶⁴ the litigation led to a clarification of Texas property law with regard to rolling easements from the Texas Supreme Court.⁶⁵ The ruling calls into question the historic practice of applying the rolling easement to beachfront property following a storm event.⁶⁶ While the court acknowledged that an easement to the dry beach (below the vegetation line) may still persist following a storm, the court, for the first time, required the state to prove the easement rather than allowing the easement to naturally roll with the vegetation line (as occurs in the case of erosion).⁶⁷ In March 2011, the Texas Supreme Court agreed to re-hear this case.⁶⁸ Regardless, the Texas application of rolling easements is limited to the beaches along the Gulf of Mexico and does not apply to bays and estuaries.⁶⁹ Consequently, rolling easements, in their current application, provide no protection to wetland areas.

2. Defend

One need not look far to find locales that have gone to extraordinary measures to defend against rising seas. Consider Venice, Italy, New Orleans, Louisiana, and the Netherlands. While scientists may argue that retreat is the best strategy for addressing sea level rise, as a practical matter, most waterfront property owners are unlikely to voluntarily relinquish their beachfront homes and sparkling coastal views.⁷⁰ Furthermore, over 50% of the U.S. population lives in coastal counties.⁷¹ This highly developed coastline makes retreat a very costly proposal, one that many local govern-

61. *Id.* at art. I, § 33(b).

62. TEX. NAT. RES. CODE § 61.013.

63. *See Severance v. Patterson*, 566 F.3d 490 (5th Cir. 2009); *Severance v. Patterson*, No. 09-0387, 2010 WL 4371438 (Tex. Nov. 5, 2010) *reh'g granted* (Mar. 11, 2011).

64. *Severance*, 566 F.3d 490 (5th Cir. 2009).

65. *Severance*, 2010 WL 4371438, at *11.

66. *Id.*

67. *Id.*

68. Oral arguments are scheduled for April 19, 2011. *Orders Pronounced March 11, 2011*, TEX. SUP. CT., <http://www.supreme.courts.state.tx.us/historical/2011/mar/031111.htm>.

69. *See* TEX. NAT. RES. CODE § 61.011(a) (2009).

70. *The Sea is Rising*, *supra* note 27, at 735-36.

71. NAT'L OCEANIC & ATMOSPHERIC ADMIN., POPULATION TRENDS ALONG THE COASTAL UNITED STATES: 1980-2008 1 (2004), available at http://oceanservice.noaa.gov/programs/mb/pdfs/coastal_pop_trends_complete.pdf.

ments simply will not consider.⁷² Not only would local governments be faced with the cost of relocating expensive infrastructure, in some instances, local municipalities may actually lose a percentage of their tax base by forcing the relocation or removal of waterfront development. For instance, following Hurricane Katrina, the Mississippi coastal community of Bay St. Louis fought against a federally proposed buyout.⁷³ In a 2007 interview, Jim Thriffiley, then President of the City Council, raised concerns that the buyout would ruin the city's economy by reducing the tax base, causing the unit price of maintaining the roads and infrastructure to "skyrocket[]." ⁷⁴ In short, the cost of retreat, combined with the lack of political will amongst local governments, makes retreat an unlikely scenario in the near future. Consequently, local land use planners are forced to consider defense mechanisms in planning for sea level rise.

Historic approaches of addressing erosion and rising seas favor defense mechanisms like construction of seawalls and bulkheads.⁷⁵ Another popular preservation technique for sandy beaches is beach nourishment.⁷⁶ Under either scenario, what was once a dynamic shoreline becomes fixed and static, thereby altering the natural processes.⁷⁷ Both approaches are briefly detailed below.

a. Beach Nourishment

Beach nourishment refers to the practice of placing additional sand on eroded beaches.⁷⁸ As is well understood by coastal engineers, constructing a seawall along a receding shoreline will result in the loss of the sandy beach between the seawall and the water's edge.⁷⁹ Recognizing the public preference for a sandy beach, most

72. See Bruce Egler, *Buyout or sellout?*, TIMES-PICAYUNE, Sept. 27, 2007, http://blog.nola.com/times-picayune/2007/09/buyout_or_sellout.html (discussing opposition and costs of a federal buy-out program following Hurricane Katrina); see Peterson et al., *supra* note 2, at 209 (discussing population and development pressures).

73. See Kathy Lohr, *Feds Propose Massive Buyout for Mississippi Coast*, NAT'L PUB. RADIO (Nov. 15, 2007), <http://www.npr.org/templates/story/story.php?storyId=16132092>.

74. *Id.*

75. Scott L. Douglass & Bradley H. Pickel, *The Tide Doesn't Go Out Anymore—The Effect of Bulkheads on Urban Bay Shorelines*, 67 SHORE & BEACH 19, 19 (1999) [hereinafter *Tide Doesn't Go Out*].

76. *Id.*

77. Melody Ray-Culp, *A Living Shoreline Initiative for the Florida Panhandle: Taking a Softer Approach*, 29 NAT'L WETLANDS NEWSL. 9, 19 (2007).

78. *The Sea is Rising*, *supra* note 27, at 733-34 (citing U.S. ARMY CORPS OF ENG'RS, SHORELINE PROTECTION AND BEACH EROSION CONTROL STUDY 6, 42-46 (1994)).

79. Scott L. Douglass & Bradley H. Pickel, *Headland Beach Construction on Bay Shorelines*, HEADLAND BEACH DEMONSTRATION PROJECT, <http://www.southalabama.edu/cesrp/hbeach.htm> (last visited May 9, 2011) [hereinafter *Headland Beach*].

states undertake some form of beach nourishment program to address erosion problems along coastal beaches.⁸⁰

While beach nourishment can be an effective tool for addressing sandy shore erosion, beach nourishment has limited application to bays and estuaries.⁸¹ With the notable exception of Mississippi,⁸² few states undertake beach nourishment along bays and estuaries, and armoring remains the predominate approach.⁸³ In addition, beach nourishment can be a costly endeavor and depends on the availability of new sand that is generally dredged from the ocean floor.⁸⁴

b. Shoreline Armoring

Armoring refers to the use of hard structures such as bulkheads, seawalls, groins, and revetments and generally consists of vertical wall structures.⁸⁵ Along bays and other lower-wave-energy areas, property owners frequently bulkhead their properties against erosion.⁸⁶ This popular erosion control tool, however, is forever altering the dynamic of the nation's coastline.⁸⁷ As one study noted, shoreline armoring of Mobile Bay, Alabama, increased from 8% in 1955 to 30% in 1997.⁸⁸ In 1997, more than 70% of armoring along Mobile Bay consisted of vertical bulkheads.⁸⁹ More recent estimates project that approximately 50% of Mobile Bay is armored.⁹⁰ The researchers also noted a correlation between the increase of shoreline armoring and the influx of population growth along the Bay.⁹¹

Although bulkheads may effectively operate to limit coastal erosion, bulkheads present a variety of disadvantages and often lead to the "unintended . . . consequences [of] vertical erosion, loss of downdrift sediment, and erosion of flanking shores."⁹² Armoring a shoreline destroys the natural variation of the shore and instead

80. *Id.*

81. *Tide Doesn't Go Out*, *supra* note 75, at 19.

82. *See Rising Seas*, *supra* note 49, at 1301 n.80 (noting that Mississippi beaches are mostly "man-made" by the U.S. Army Corps of Engineers to protect roads).

83. *Rising Seas*, *supra* note 49, at 1301; *Headland Beach*, *supra* note 79.

84. Donna R. Christie, *Of Beaches, Boundaries and SOBs*, 25 J. LAND USE & ENVTL. L. 19, 38 (2009).

85. SWANN, *supra* note 9, at 2; *Tide Doesn't Go Out*, *supra* note 75, at 19.

86. *Tide Doesn't Go Out*, *supra* note 75, at 19.

87. *See id.*; *see also State and Local Governments Plan*, *supra* note 36, at 1 (discussing the impact of shore protection structures on wetlands).

88. *Tide Doesn't Go Out*, *supra* note 75, at 21.

89. *Id.* at 22.

90. MISS.-ALA. SEA GRANT CONSORTIUM, SHORELINE PROTECTION ALTERNATIVES (2007), available at <http://www.masgc.org/pdf/masgp/07-026.pdf>.

91. *Tide Doesn't Go Out*, *supra* note 75, at 24.

92. SWANN, *supra* note 9, at 2.

fixes the shoreline at a static point.⁹³ The loss of the intertidal zone is often referred to as a “bathtub” effect, whereby “the gradual sloping transition from water to land is transformed into right angles.”⁹⁴ In other words, waves lap against the bulkhead rather than a sloping shoreline, creating the so-called bathtub effect.⁹⁵

Loss of the intertidal zone leads to both ecological and societal harms.⁹⁶ Bulkheads eventually eliminate all intertidal habitat and significantly reduce both the abundance and the diversity of many near-shore species.⁹⁷ Gulf of Mexico marshes provide habitat and refuge for “more than 60 species of birds; 80 species of fish; and many invertebrate, mammal and reptile species.”⁹⁸ The associated changes include poor water quality as well.⁹⁹ Intertidal marshes also offer protection against storm surge.¹⁰⁰

Another significant disadvantage of losing the intertidal zone is the restrictions on the public’s ability to walk along the shoreline as recognized by the public trust doctrine.¹⁰¹ Other losses include diminished waterfront access for landing boats, recreation, and fishing (historically protected by the public trust).¹⁰² In extreme circumstances, littoral property owners may even lose their waterfront views when armoring structures or dune systems must be built to increasing heights to be effective.¹⁰³

In 2007, the National Research Council aptly summarized the challenges raised by shoreline armoring:

Landowners frequently respond to the threat of erosion by armoring the shoreline with bulkheads, revetments, and other structures. Although the armoring of a few properties has little impact, the proliferation of structures along the shoreline can inadvertently change the coastal environment and the ecosystem services that these areas provide. Managers and decision-makers have been challenged to balance the trade-offs between protection of property and potential loss of landscapes, public access, recreational opportunities,

93. Ray-Culp, *supra* note 77, at 19.

94. *Id.*

95. *Headland Beach*, *supra* note 79.

96. *Tide Doesn’t Go Out*, *supra* note 75, at 19.

97. Peterson et al., *supra* note 2, at 218.

98. SWANN, *supra* note 9, at 2 (citation omitted).

99. Peterson et al., *supra* note 2, at 218.

100. SWANN, *supra* note 9, at 2.

101. *Tide Doesn’t Go Out*, *supra* note 75, at 19.

102. *The Sea is Rising*, *supra* note 27, at 740.

103. *Id.*

natural habitats, and reduced populations of fish and other living marine resources that depend on these habitats.¹⁰⁴

C. Strategies for Wetland Preservation: Living Shorelines

As can be seen from the previous discussion, current popular defense mechanisms do little to protect wetland areas and, in the case of armoring, may actually lead to the destruction of existing wetland areas along the coastline.¹⁰⁵ More recently, a third approach to shoreline defense is slowly gaining traction with state and local governments—the use of “living shorelines.”¹⁰⁶ The concept of living shorelines has been described as “a suite of bank stabilization and habitat restoration techniques to reinforce the shoreline, minimize coastal erosion, and maintain coastal processes while protecting, restoring, enhancing, and creating natural habitat.”¹⁰⁷

Living shorelines refer to the use of “living plant material, oyster shells, earthen material, or a combination of natural structures with riprap or offshore breakwaters to protect property from erosion.”¹⁰⁸ In lower energy wave areas such as bays and estuaries, living shorelines provide a practical alternative to commonly used hard structures.¹⁰⁹ Rather than single purpose shoreline armoring, living shorelines “serve multiple roles by controlling erosion, maintaining natural coastal processes, and sustaining biodiversity through land-use management, soft armoring, or combinations of soft and semi-hard armoring techniques.”¹¹⁰ Additionally, some studies suggest that construction and maintenance of living shorelines is more economical than armoring with hard structures and also requires less maintenance over time.¹¹¹

However, living shorelines are not suited for high-energy areas like open beaches, where beach nourishment remains a better means for addressing erosion.¹¹² In areas of low energy, vegetative plantings alone may suffice while areas of moderate wave energy

104. NAT'L RESEARCH COUNCIL, *supra* note 4, at 1.

105. Ray-Culp, *supra* note 77, at 19.

106. *See generally* MISS.-ALA. SEA GRANT CONSORTIUM, *supra* note 90 (providing general information about living shorelines); Ray-Culp, *supra* note 77, at 19; SWANN, *supra* note 9, at 1.

107. SWANN, *supra* note 9, at 2 (citation omitted).

108. MISS.-ALA. SEA GRANT CONSORTIUM, *supra* note 90.

109. Ray-Culp, *supra* note 77, at 10.

110. SWANN, *supra* note 9, at 1.

111. MISS.-ALA. SEA GRANT CONSORTIUM, *supra* note 90; *see also* SWANN, *supra* note 9, at 10.

112. *Tide Doesn't Go Out*, *supra* note 75, at 19, 25.

may require hybrid approaches such as plantings combined with a wooden breakwater.¹¹³ Where appropriately installed, living shorelines maintain and sometimes increase wetlands and intertidal habitat, providing flood control, water quality enhancement, and preservation of the land/water interface providing water access for animals and people.¹¹⁴

Currently, living shorelines are actively encouraged in north-west Florida through Project GreenShores.¹¹⁵ The GreenShores program, which targets habitat restoration and creation, has been applied across the North America.¹¹⁶ In Florida, focus lies on restoring Pensacola Bay to “stabilize[] shorelines and provide[] essential habitat for wildlife propagation and conservation.”¹¹⁷ In the other Gulf states, living shorelines are allowed, but the current regulatory process continues to favor the traditional approach of bulkheading bays and estuaries. For instance, Alabama encourages use of native wetland vegetation for shoreline stabilization but lacks a streamlined permitting process.¹¹⁸ However, efforts are underway to streamline the permitting process for living shorelines in Alabama¹¹⁹ and Mississippi,¹²⁰ with the hope that landowners will begin shifting away from hard structures in favor of living shorelines.¹²¹

III. PROPERTY RIGHTS AFFECTING SHORELINE REGULATION

When deciding what shoreline management strategies to employ, local decision-makers must keep in mind not only the importance of shoreline preservation, but also how established legal

113. Ray-Culp, *supra* note 77, at 10; *see also* MISS.-ALA. SEA GRANT CONSORTIUM, *supra* note 90 (detailing various types of shoreline stabilization structures and their uses, including hybrid structures).

114. MISS.-ALA. SEA GRANT CONSORTIUM, *supra* note 90.

115. FLA. DEP'T OF ENVTL. PROT., NW. DIST., *Project GreenShores*, <http://www.dep.state.fl.us/northwest/Ecosys/section/greenshores.htm> (last visited May 9, 2011).

116. *Id.* In addition to Florida, both Canada and New York have programs. GREENSHORES, <http://www.greenshores.ca/> (last visited May 9, 2011); GREEN SHORES NYC, http://www.greenshoresnyc.org/Site/Green_Shores_NYC.html (last visited May 9, 2011).

117. FLA. DEP'T OF ENVTL. PROT., NW. DIST., *supra* note 108.

118. ALA. ADMIN. CODE r. 220-4-.09(4)(b)(6) (2007).

119. *See* Mobile District, U.S. Army Corps of Engineers, Proposed General Permit for Living Shorelines for Use within the State of Alabama, SAM-2010-1482-SPG (Jan. 21, 2011), *available at* <http://www.sam.usace.army.mil/rd/reg/PN/currentPNs/SAM-2010-01482-SPG.pdf>.

120. *See* Mobile District, U.S. Army Corps of Engineers, Proposed General Permits for Minor Structures and Activities within the Coastal Counties of the State of Mississippi, SAM-2010-1343-SPG (Jan. 25, 2011), *available at* <http://www.sam.usace.army.mil/rd/reg/PN/currentPNs/SAM-2010-1343-SPG.pdf>.

121. Chris Boyd & Niki Pace, *Homeowners Guide to Permitting Living Shorelines in Mississippi and Alabama*, MISS.-ALA. SEA GRANT LEGAL PROGRAM, http://masglp.olemiss.edu/living_shorelines.pdf (last visited May 9, 2011).

doctrines will affect the favored strategy. For instance, decision-makers must consider what their legal responsibilities are under the public trust doctrine.¹²² Likewise, lawmakers must recognize that certain regulatory decisions may lead to takings claims by the impacted landowners.¹²³ Further complicating the matter is the migratory nature of waterfront property lines and the rights of upland property owners, known as littoral rights.¹²⁴

To this end, local decision-makers are faced with three possible scenarios. In one scenario, regulators can continue to permit shoreline armoring. Local governments will evade regulatory takings challenges for permit denials but will lose valuable habitat and public trust land along the shoreline. On the other hand, regulators may ban shoreline armoring, thereby preserving the natural shoreline and the public interest in the land/water interface. However, property owners may argue that a regulatory taking occurred through this permit denial. In the third scenario, regulators may choose to ban hard structures along bays and estuaries in favor of living shorelines. Using living shorelines, landowners are afforded protection against erosion, and the public trust interest in the land/water interface is preserved. Yet, because living shorelines allow property owners to accrete land, this concept raises a separate public trust issue—namely that living shorelines will deplete what were once submerged lands belonging to the state. In the context of these three possibilities, the applicable legal concepts are explored in greater detail below.

A. Accretion and Avulsion

Before considering the impacts of the public trust doctrine and possible takings claims, regulators must recognize the migratory nature of waterfront property lines and how that migration may impact future claims. As previously discussed, shorelines are naturally evolving environments where the land/water boundary often varies as a result of erosion and sedimentation.¹²⁵ To address the

122. See Alexandra B. Klass, *Modern Public Trust Principles: Recognizing Rights and Integrating Standards*, 82 NOTRE DAME L. REV. 699, 730-742 (2006) (examining judicial decisions requiring states to consider public trust obligations in state actions); Joseph L. Sax, *Some Unorthodox Thoughts About Rising Sea Levels, Beach Erosion, and Property Rights*, 11 VT. J. ENVTL. L. 641, 643 (2010).

123. See J. Peter Byrne, *Rising Seas and Common Law Baselines: A Comment on Regulatory Takings Discourse Concerning Climate Change*, 11 VT. J. ENVTL. L. 625, 625 (2010); *Rising Seas*, *supra* note 49, at 1334.

124. See BLACK'S LAW DICTIONARY 1018 (9th ed. 2009) (defining littoral as "[o]f or relating to the coast or shore of an ocean, sea, or lake").

125. Ray-Culp, *supra* note 77, at 9.

ambulatory nature of shorelines, and therefore property lines, common law developed rules to address accretion and avulsion.¹²⁶

Under common law, shoreline migration resulting from gradual changes is treated distinctly from sudden, or avulsive, events.¹²⁷ In the first instance, the littoral boundary shifts either as a result of accretion (where sediment is added to the shoreline) or erosion (where littoral owners lose land).¹²⁸ Whether by accretion or erosion, the property line continues to track the water line.¹²⁹ However, property lines remain static following an avulsion—the sudden removal of soil and sand following a hurricane or flood.¹³⁰ As characterized by the U.S. Supreme Court, “regardless of whether an avulsive event exposes land previously submerged or submerges land previously exposed, the boundary between littoral property and sovereign land does not change; it remains (ordinarily) what was the mean high-water line before the event.”¹³¹ In other words, an avulsive event, by holding the property line static, severs the previous migration of property line from the shoreline and fixes the boundary at a static location.¹³²

B. The Public Trust Doctrine

The public trust doctrine originated in notions of common property in Roman law.¹³³ Under the Justinian Code, the sea and its shorelines were deemed property intended for the use and benefit of the public and were thus incapable of being privately owned.¹³⁴ The concept that the state holds lands submerged beneath navigable waterways in trust for the people further evolved under the English common law and, in turn, was incorporated into American jurisprudence following the American Revolution.¹³⁵ Each of the original thirteen states became the trustee of the sub-

126. See Joseph J. Kalo, *North Carolina Oceanfront Property and Public Waters and Beaches: The Rights of Littoral Owners in the Twenty-First Century*, 83 N.C. L. REV. 1427, 1434-40 (2005).

127. Christie, *supra* note 84, at 26-27.

128. *Id.* at 26.

129. *Stop the Beach Renourishment, Inc. v. Fla. Dep't of Env'tl. Prot.*, 130 S. Ct. 2592, 2599 (2010).

130. *Id.* Avulsion is literally defined as “a tearing away.” BLACK'S LAW DICTIONARY 157 (9th ed. 2009).

131. *Stop the Beach Renourishment, Inc.*, 130 S. Ct. at 2599 (citations omitted) (summarizing the avulsion doctrine in the context of Florida law).

132. *Id.*

133. See Wilkins & Wascom, *supra* note 1, at 863-68 (discussing the origin and development of the public trust doctrine).

134. J.B. MOYLE, *THE INSTITUTES OF JUSTINIAN D2* (Oxford at the Clarendon Press, 5th ed. 1913); Sarah C. Smith, *A Public Trust Argument for Public Access to Private Conservation Land*, 52 DUKE L.J. 629, 639 (2002).

135. Wilkins & Wascom, *supra* note 1, at 864.

merged lands within its borders for the use of the people.¹³⁶ As additional states were admitted into the Union, they too received the title to these lands under the equal footing doctrine, meaning that newly recognized states entered the Union with the same sovereign powers and rights as the original colonies.¹³⁷

Although state implementation of the public trust doctrine varies, some commonalities persist. Under the public trust doctrine, the state holds title to submerged lands underlying navigable waters in trust for the public to protect the traditionally public nature of these lands.¹³⁸ As characterized by the U.S. Supreme Court in *Illinois Central Railroad Co. v. Illinois*, “[i]t is a title held in trust for the people of the state, that they may enjoy the navigation of the waters, carry on commerce over them, and have liberty of fishing therein, freed from the obstruction or interference of private parties.”¹³⁹ In other words, the public trust doctrine extends to the public use of navigation, commerce, and fishing.¹⁴⁰ Although the public trust generally embodies these common elements, actual implementation of the public trust varies by state.¹⁴¹ For instance, some states have expanded the public trust doctrine to encompass recreation¹⁴² and environmental preservation.¹⁴³ The public trust doctrine also operates as a limitation on states’ ability to alienate submerged lands “unless conveyed for uses promoting the interest of the public.”¹⁴⁴ Accordingly, the public may access and use state-owned submerged lands provided that such use does not interfere with the rights of other members of the public.¹⁴⁵

136. *Martin v. Waddell*, 41 U.S. 367, 410 (1842).

137. *Id.*; see also *Phillips Petroleum Co. v. Mississippi*, 484 U.S. 469, 474-76 (1988) (holding that Mississippi, upon entering Union, took title to lands lying under waters that were influenced by tide running in Gulf of Mexico but were not navigable-in-fact).

138. *Martin*, 41 U.S. at 410-11.

139. *Ill. Cent. R.R. Co. v. Illinois*, 146 U.S. 387, 452 (1892).

140. *Id.*

141. See generally Robin Kundis Craig, *A Comparative Guide to the Eastern Public Trust Doctrines: Classification of States, Property Rights, and State Summaries*, 16 PENN ST. ENVTL. L. REV. 1 (2007) (providing a detailed discussion of eastern states’ public trust doctrines).

142. *Esplanade Props., LLC v. City of Seattle*, 307 F.3d 978, 985 (9th Cir. 2002); *State v. McIlroy*, 595 S.W.2d 659, 665 (Ark. 1980).

143. See *Citizens for Responsible Wildlife Mgmt. v. State*, 103 P.3d 203, 207-08 (Wash. Ct. App. 2004).

144. Klass, *supra* note 122, at 704; see also Craig, *supra* note 141, at 10 (the public trust doctrine limits states’ ability to alienate submerged lands).

145. See, e.g., *Boone v. Harrison*, 660 S.E.2d 704, 711 (Va. Ct. App. 2008) (citing *Palmer v. Commonwealth Marine Res. Comm’n*, 628 S.E.2d 84, 89 (Va. Ct. App. 2006)).

1. The Public Trust Doctrine in the Five Gulf States

As addressed in great detail by Professor Robin Kundis Craig, each state varies in its application of the public trust.¹⁴⁶ In looking at the five Gulf of Mexico states, notable distinctions persist. While there are general commonalities based upon federal case law, individual state jurisprudence applying the public trust doctrine to the property laws of that state has given rise to unique state-specific public trust doctrines.¹⁴⁷ For the purposes of this discussion of shoreline regulation, the primary issues with regard to the public trust become twofold: 1) determining what land is subject to the public trust (i.e. what is the boundary between the state and the littoral owner); and 2) determining what rights the state extends to those public trust lands. As this article focuses on the Gulf of Mexico, the distinctions of each of the five Gulf states are briefly discussed.

a. Alabama

Alabama's public trust doctrine is poorly developed and limited to the basic federal doctrine.¹⁴⁸ Alabama recognizes the public right to navigation through its Constitution which proclaims that "all navigable waters shall remain forever public highways, free to the citizens of the state and the United States[.]"¹⁴⁹ Courts have extended this right to fishing and submerged lands.¹⁵⁰ Alabama considers all navigable-in-fact waters, as well as all tidal waters, subject to the public trust.¹⁵¹ Along tidal properties, the mean high tide line demarks the upland owner's property from public trust lands.¹⁵² Therefore, under Alabama law, the wet beach belongs to the state, in trust for the public. Allowing armoring of the upland property essentially eliminates the publicly held beach and associated intertidal zone.¹⁵³

b. Florida

Like Alabama, Florida also incorporates the public trust into its constitution: "The title to lands under navigable waters, . . . in-

146. See generally Craig, *supra* note 141, at 11 (examining the variation of state public trust obligations).

147. *Id.*

148. *Id.* at 24.

149. ALA. CONST. art. I, § 24.

150. See *State v. Harrub*, 10 So. 752, 753 (Ala. 1892).

151. Craig, *supra* note 141, at 26-27.

152. *Id.* (citing *Tallahassee Fall Mfg. Co. v. State*, 68 So. 805, 806 (Ala. 1915)).

153. *Tide Doesn't Go Out*, *supra* note 75, at 19.

cluding beaches below mean high water lines, is held by the state, by virtue of its sovereignty, in trust for all the people.”¹⁵⁴ In Florida, littoral rights include “the right of access to the water, the right to use the water for certain purposes, the right to an unobstructed view of the water, and the right to receive accretions and relictions to the littoral property.”¹⁵⁵ However, Florida extends the public trust doctrine to all lands below mean high tide.¹⁵⁶ Waters that are subject to the ebb and flow of tide are not necessarily considered navigable for purposes of the public trust and must be “navigable in fact.”¹⁵⁷ The public trust interest in the foreshore extends to “navigation, commerce, fishing, and bathing and ‘other easements allowed by law.’”¹⁵⁸ As noted by others, the phrase “and other easements allowed by law” suggests that the Florida public trust doctrine may be expanded.¹⁵⁹

c. Louisiana

While the Louisiana constitution does not explicitly reference the public trust doctrine, the constitution clearly identifies state protection of environmental values: “The natural resources of the state, including air and water, and the healthful, scenic, historic, and esthetic quality of the environment shall be protected, conserved, and replenished insofar as possible and consistent with the health, safety, and welfare of the people.”¹⁶⁰ Courts have interpreted this provision as the state’s public trust doctrine.¹⁶¹ Historically, state public trust lands extended to the mean high tide line.¹⁶² Along the seashore, however, Louisiana statutorily declared ownership up to the “highest winter tide, which is lower than the mean

154. FLA. CONST. art. X, § 11.

155. *Stop the Beach Renourishment, Inc. v. Fla. Dep’t of Env’tl. Prot.*, 130 S. Ct. 2592, 2598 (2010).

156. *White v. Hughes*, 190 So. 446, 449 (Fla. 1939) (“Private ownership stops at high-water mark.”).

157. *City of Tarpon Springs v. Smith*, 88 So. 613, 619 (Fla. 1921) (“Waters are not under our law regarded as navigable merely because they are affected by the tides.”); *Lopez v. Smith*, 109 So. 2d 176, 179 (Fla. 2d DCA 1959) (“Navigable waters do not extend, however, to all waters merely because they are affected by the tides but which are not in fact capable of navigation for useful public purposes.”); Craig, *supra* note 141, at 36.

158. *Brannon v. Boldt*, 958 So. 2d 367, 372 (Fla. 2d DCA 2007) (quoting *Broward v. Mabry*, 50 So. 826, 830 (Fla. 1909)).

159. Craig, *supra* note 141, at 38.

160. LA. CONST. art. IX, § 1; *see also*, Craig, *supra* note 141, at 54. *See generally* Wilkins & Wascom, *supra* note 1 (for a detailed discussion of the Louisiana public trust doctrine).

161. *La. Seafood Mgmt. Council v. La. Wildlife & Fisheries Comm’n*, 719 So. 2d 119, 124 (La. Ct. App. 1998) (“Article IX, section 1 of the Louisiana Constitution sets forth this state’s Public Trust Doctrine . . .”).

162. *McCormick Oil & Gas Corp. v. Dow Chem. Co.*, 489 So. 2d 1047, 1049 (La. Ct. App. 1986).

high tide line.”¹⁶³ Where banks of navigable streams and rivers are privately owned, public trust rights extend to land below the mean high tide line.¹⁶⁴ Louisiana recognizes public trust rights of “navigation, fishery, recreation, and other interests.”¹⁶⁵ Public trust rights give a person “the right to fish in the rivers, ports, roadsteads, and harbors, and the right to land on the seashore, to fish, to shelter himself, to moor ships, to dry nets, and the like, provided that he does not cause injury to the property of adjoining owners.”¹⁶⁶ Relying on the public trust doctrine, Louisiana courts have upheld erosion control measures, denying claims that the measures resulted in a taking of oyster beds.¹⁶⁷

d. Mississippi

Although Mississippi does not constitutionally reference the public trust doctrine, two statutory provisions of state law codify Mississippi’s public trust: the Public Trust Tidelands Act¹⁶⁸ and the Coastal Wetlands Protection Act.¹⁶⁹ Under the Public Trust Tidelands Act, the state declares its public policy:

[T]o favor the preservation of the natural state of the public trust tidelands and their ecosystems and to prevent the despoliation and destruction of them, except where a specific alteration of specific public trust tidelands would serve a higher public interest in compliance with the public purposes of the public trust in which such tidelands are held.¹⁷⁰

Likewise, the Coastal Wetlands Protection Act declares:

[T]he public policy of this state [is] to favor the preservation of the natural state of the coastal wetlands and their ecosystems and to prevent the despoliation and destruction of them, except where a specific alteration of specific coastal wetlands would serve a higher public interest in compliance

163. Craig, *supra* note 141, at 58 (citation omitted); LA. CIV. CODE art. 451 (2009) (“Seashore is the space of land over which the waters of the sea spread in the highest tide during the winter season.”).

164. See LA. CIV. CODE art. 456.

165. LA. REV. STAT. § 41:1701 (2009).

166. LA. CIV. CODE art. 452.

167. *Avenal v. State*, 886 So. 2d 1085, 1103-09 (La. 2004); see also *Klass*, *supra* note 122, at 711-12 (discussing the Louisiana Supreme Court’s rationale in allowing the diversion project without finding a taking of the oyster beds).

168. MISS. CODE §§ 29-15-1 to 29-15-7 (2010).

169. *Id.* §§ 49-27-1 to 49-27-5.

170. *Id.* § 29-15-3(1).

with the public purposes of the public trust in which coastal wetlands are held.¹⁷¹

As set forth by the Public Trust Tidelands Act, submerged lands and tidelands are geographically subject to the public trust, and the state holds the title to these lands in trust for the people.¹⁷² The Mississippi legislature has distinguished tidelands from submerged lands, noting that tidelands are “covered and uncovered by water” due to tidal action on a daily basis,¹⁷³ whereas submerged lands are those which continually remain covered with water in areas affected by the ebb and flow of the tide.¹⁷⁴ The Act further recognizes that the boundary separating the public trust tidelands from upland property—the mean high water line¹⁷⁵—is ambulatory and that lands subject to the public trust can increase, as rising sea levels submerge land not typically subject to the ebb and flow of the tide, and decrease, as accretion causes land to gradually accumulate along the shoreline.¹⁷⁶

In *Cinque Bambini Partnership v. State*, the Mississippi Supreme Court outlined the purposes to which public trust lands may be devoted, noting that, by adapting to suit the needs of society, the public trust is not static.¹⁷⁷ These purposes include, but are not limited to, transportation,¹⁷⁸ fishing,¹⁷⁹ swimming and recreation,¹⁸⁰ the development of mineral resources,¹⁸¹ and environmental preservation.¹⁸² The Mississippi Supreme Court further clarified ownership of accreted lands and littoral property rights in *Bayview Land, Ltd. v. State*.¹⁸³ While naturally occurring accretions continue to track the shifting high tide mark, the court distinguished artificial accretions such as “the accumulation of oyster shells over time, or what is known as ‘wharfing out’ into the water, which is establishing or affixing to the land a permanent structure

171. *Id.* § 49-27-3.

172. *Id.* § 29-15-5.

173. *Id.* § 29-15-1(h).

174. *Id.* § 29-15-1(g).

175. *Id.* § 29-15-3(2) (“It is hereby declared to be a higher public purpose of this state and the public tidelands trust to resolve the uncertainty and disputes which have arisen as to the location of the boundary between the state’s public trust tidelands and the upland property and to confirm the mean high water boundary line as determined by the Mississippi Supreme Court, the laws of this state and this chapter.”).

176. *Id.* § 29-15-7(2).

177. 491 So. 2d 508, 512 (Miss. 1986).

178. *See* *Rouse v. Saucier’s Heirs*, 146 So. 291, 292 (Miss. 1933).

179. *See* *State ex rel. Rice v. Stewart*, 184 So. 44, 50 (Miss. 1938).

180. *Treuting v. Bridge & Park Comm’n*, 199 So. 2d 627, 632-33 (Miss. 1967).

181. *Id.* at 633.

182. MISS. CODE § 49-27-3 (2010).

183. 950 So. 2d 966 (Miss. 2006).

to some point within a navigable body of water.”¹⁸⁴ When evaluating ownership of artificial accretions to property, the Public Trust Tidelands Act requires courts to use the mean high tide line of coastal property as of July 1, 1973 (the effective date of the Coastal Wetlands Protection Act), rather than the date of Mississippi’s admission into the Union.¹⁸⁵

e. Texas

Texas has a long tradition of recognizing public access to its Gulf beaches.¹⁸⁶ “[S]oil covered by the bays, inlets, and arms of the Gulf of Mexico within tidewater limits belongs to the State, and constitutes public property that is held in trust for the use and benefit of all the people.”¹⁸⁷ In a recent Texas Supreme Court decision, the court summarized Texas public trust lands:

Having established that the State of Texas owned the land under Gulf tidal waters, the question remained how far inland from the low tide line did the public trust—the State’s title—extend. We answered that question in *Luttet v. State*. This Court held that the delineation between State-owned submerged tidal lands (held in trust for the public) and coastal property that could be privately owned was the “mean higher high tide” line under Spanish or Mexican grants and the “mean high tide” line under Anglo-American law. The wet beach is owned by the State as part of the public trust, and the dry beach is not part of the public trust and may be privately owned. Prior to *Luttet*, there was a question whether the public trust extended to the vegetation line. *Luttet* established the landward boundary of the public trust at the mean high tide line.¹⁸⁸

184. *Id.* at 968-69.

185. *Id.* at 976-77, 981-82.

186. See *Severance v. Patterson*, No. 09-0387, 2010 WL 4371438, at *5 (Tex. Nov. 5, 2010) *reh’g granted* (Mar. 11, 2011).

187. *Id.* (quoting *Lorino v. Crawford Packing Co.*, 175 S.W.2d 410, 413 (Tex. 1943)); *Landry v. Robison*, 219 S.W. 819, 820 (1920) (“For our decisions are unanimous in the declaration that by the principles of the civil and common law soil under navigable waters was treated as held by the state or nation in trust for the whole people.”); see also TEX. NAT. RES. CODE § 11.012(c) (2010) (“The State of Texas owns the water and the beds and shores of the Gulf of Mexico and the arms of the Gulf of Mexico within the boundaries provided in this section, including all land which is covered by the Gulf of Mexico and the arms of the Gulf of Mexico either at low tide or high tide.”).

188. *Severance*, 2010 WL 4371438, at *6 (citations omitted).

Recognizing the scarcity of water as a public resource, Texas applies the public trust to all navigable water bodies and underlying beds. This right has been codified by the Texas Water Code:

The water of the ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state is the property of the state.¹⁸⁹

Likewise, the Texas Supreme Court recognizes a long standing rule of state ownership of lands underlying navigable waters.¹⁹⁰ Because of Texans' historic use of the "dry beach," a public easement often exists along Gulf beaches.¹⁹¹ As discussed previously, the Texas Open Beaches Act, later enacted as a constitutional amendment, provides additional protections of public beach access.¹⁹² The beaches provide a source of transportation, commerce, and recreation. The mean high tide mark delineates the "wet beach" from the "dry beach." Landowners may own property extending to the mean high tide mark but the "wet beach" is held by the State in public trust.¹⁹³

2. The Public Trust Doctrine & Shoreline Regulation

By definition, the public trust doctrine impacts littoral property rights along the shoreline. Essentially, the public trust doctrine forces the state to play the dual role of regulator and property owner.¹⁹⁴ Because states generally own the shoreline along with the submerged lands in trust for the public, the public is entitled to use of the intertidal area.¹⁹⁵ This can include use of the wet beach for passage and recreation as well as preservation of coastal wetlands for habitat. However, by allowing shoreline armoring, states are both failing to protect public trust land and aiding in its destruction.¹⁹⁶ The challenge becomes how to strike a balance be-

189. TEX. WATER CODE § 11.021(a) (2010).

190. *City of Galveston v. Mann*, 143 S.W.2d 1028, 1033 (Tex. 1940); *see also* *Cummins v. Travis Cnty. Water Control & Improvement Dist. No. 17*, 175 S.W.3d 34, 48 (Tex. App. 2005).

191. *Severance*, 2010 WL 4371438, at *3-*4 (citations omitted).

192. *See supra* section II.B.1.b.

193. *See* TEX. NAT. RES. CODE § 61.014 (2010).

194. Sax, *supra* note 122, at 643.

195. *See generally*, Craig, *supra* note 141, 6-10 (discussing state ownership of submerged lands and ownership of beds and banks where waters are navigable-in-fact).

196. *See* Madeline Reed, Comment, *Seawalls and the Public Trust: Navigating the Tension Between Private Property and Public Beach Use in the Face of Shoreline Erosion*, 20 FORDHAM ENVTL. L. REV. 305, 307-311 (2009).

tween the competing interests of private property owners and the public's interest in state public trust lands.¹⁹⁷

Going back to the three potential scenarios, the public trust doctrine supports the second possibility—banning shoreline armoring—and as will be discussed below, the public trust doctrine, as a background principle of property law, may absolve takings claims.¹⁹⁸ For instance, in 2004, the Louisiana Supreme Court, relying in part on the state's public trust doctrine, found no taking occurred when the state allowed an erosion control project that negatively impacted oyster beds.¹⁹⁹ The court expressly recognized that the project, designed to preserve its coastline, “fits precisely within the public trust.”²⁰⁰ Loss of the coastline presents not only environmental concerns, but also health, safety, and public welfare concerns “as coastal erosion removes an important barrier between large populations and ever-threatening hurricanes and storms.”²⁰¹ The state's interest in preventing coastal erosion superseded the impacts to oyster beds.²⁰² This decision suggests that, at least in Louisiana, permitting living shorelines would better serve the state's public trust obligations than allowing bulkheading of the shoreline.

However, just as the public trust doctrine supports banning shoreline armoring, the doctrine has also functioned as an impediment to alternative shoreline management techniques, such as living shorelines, in at least one state. In Alabama, the use of living shorelines requires the littoral property owner to enter into a deed restriction, fixing the property line at “pre-living shoreline” boundary.²⁰³ Any newly accreted land occurring after the installation of the living shoreline, which would traditionally accrue to the private property owner, instead remains the property of the

197. Sax, *supra* note 122, at 644-45.

198. *Rising Seas*, *supra* note 49, at 1313; Meg Caldwell & Craig Holt Segall, *No Day at the Beach: Sea Level Rise, Ecosystem Loss, and Public Access Along the California Coast*, 34 *ECOLOGY L.Q.* 533, 567-68 (2007).

199. *See Avenal v. State*, 886 So.2d 1085, 1101 (La. 2004); Klass, *supra* note 122, at 711-12.

200. *Avenal*, 886 So. 2d at 1101.

201. *Id.*

202. *Id.* at 1102.

203. ALA. CODE § 9-15-55(d) (2010); *see also* Proposed General Permit SAM-2010-1482-SPG, *supra* note 119 (noting the need for coordination with Alabama State Lands and that shoreline accretion resulting from living shorelines may not result in a change in property boundaries.).

state.²⁰⁴ This deed restriction requirement, in a state that traditionally permits bulkheads along its estuarine shoreline,²⁰⁵ has caused a chilling effect on the use of living shorelines in Alabama. One way to overcome these concerns may be to implement a fixed property line, as Mississippi established through the Public Trust Tidelands Act.²⁰⁶ As previously discussed, artificial accretions do not divest Mississippi from ownership of its submerged lands.²⁰⁷ To the extent that living shorelines are treated as artificial accretions, Mississippi will not lose any public trust lands through permitting living shorelines. While Alabama law, in essence, effectuates the same result, imposition of the deed restriction steers many Alabama property owners away from living shorelines in favor of shoreline stabilization structures that will not accrete land, and therefore, not require a deed restriction.

C. The Takings Clause

As noted by Professor Joseph Sax, the relationship between public trust ownership of submerged lands and takings claims of upland owners increases the challenge of applying traditional takings rules.²⁰⁸ The Takings Clause originates with the Fifth Amendment of the U.S. Constitution and expressly prohibits government seizure of private property for public use without just compensation.²⁰⁹ The Takings Clause serves the purpose of protecting certain individuals from “bear[ing] public burdens,” which are more fairly “borne by the public as a whole.”²¹⁰ Readily identifiable takings claims occur when the government physically invades and

204. ALA. CODE § 9-15-55.(d) (2010). *See also* Spottswood v. Reimer, 41 So.3d 787, 795-796 (Ala. Civ. App. 2009) (landowner “has a right to land created in front of her land by artificial accretion that is superior to the right of the State if neither the landowner nor his or her predecessor in title is responsible for the artificial accretion of the land *but has an inferior right to that of the State if the landowner or his or her predecessor in title is responsible for the artificial accretion.*”) (emphasis added).

205. Through regulation, Alabama does restrict the ability to construct bulkheads and similar devices along Gulf beaches. ALA. ADMIN. CODE r. 335-8-2-.08 (2010). At the administrative level, regulatory takings challenges to the regulation have been unsuccessful. *In re Gulf Towers Condo. Assn., v. Ala. Dep’t Env’tl. Mgmt.* No. 02-04, 2003 WL 676058 (Ala. Dept. Env. Mgmt. Feb. 25, 2003); *In re Garrison v. Ala. Dep’t Env’tl. Mgmt.* No. 04-12, 2005 WL 6194618 (Ala. Dept. Env. Mgmt. Nov. 4, 2005).

206. MISS. CODE §§ 29-15-1 to 29-15-7 (2010).

207. Bayview Land, Ltd. v. State, 950 So. 2d 966, 983 (Miss. 2006).

208. Sax, *supra* note 122, at 644-45; *see also* Michael A. Hiatt, *Come Hell or High Water: Reexamining the Takings Clause in a Climate Changed Future*, 18 DUKE ENVTL. L. & POL’Y F. 371, 381-385 (2008) (discussing the collision of state’s public trust obligations with the takings clause).

209. U.S. CONST. amend. V.

210. Nathan Jacobsen, *Sand or Concrete at the Beach? Private Property Rights on Eroding Oceanfront Land*, 31 ENVIRONS: ENVTL. L. & POL’Y J. 217, 221 (2008) (citing *Armstrong v. United States*, 364 U.S. 40, 49 (1960)).

occupies an individual's property.²¹¹ Physical takings can extend to grants of public access to private property as well.²¹² Regulatory takings, however, can be more difficult to define.²¹³

The doctrine of regulatory takings is designed "to identify regulatory actions that are functionally equivalent to the classic taking."²¹⁴ Local governments, through land use planning and zoning requirements, frequently impose limits on the use of private property.²¹⁵ A taking occurs when those restrictions go "too far."²¹⁶ However, ascertaining precisely when a regulation goes "too far" can be challenging for courts. In conducting an analysis, courts frequently apply a balancing test set out by the U.S. Supreme Court in *Penn Central Transportation Company v. City of New York*.²¹⁷ In *Penn Central*, the Court set out three considerations when evaluating a takings claim: 1) "[t]he economic impact of the regulation;" 2) how, and to what extent, the regulation has "interfered with [reasonable] investment-backed expectations;" and 3) the "character of the government[] action" (i.e., whether the government action promotes the common good or causes a particular individual to disproportionately bear the burden).²¹⁸

Then, in *Lucas v. South Carolina Coastal Council*, the Supreme Court recognized a per se taking for any regulation that deprived a property owner of "all economically beneficial uses" of his or her property.²¹⁹ The Court found that unless common law nuisance or a background principle of property law justified the regulation, the property owner is entitled to compensation.²²⁰ Where a regulation does not constitute a per se taking, courts continue to apply the *Penn Central* factors.²²¹

1. Takings Challenges to Shoreline Armoring

Considering the migratory nature of shorelines, legal issues arising from shoreline management are frequently raised in the context of regulatory takings.²²² Courts have routinely denied reg-

211. *Id.*

212. *Id.* at 222.

213. *Id.*

214. *Stop the Beach Renourishment, Inc. v. Fla. Dep't of Env'tl. Prot.*, 130 S. Ct. 2592, 2601 (2010) (quoting *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528, 539 (2005)).

215. *Jacobsen*, *supra* note 210, at 222.

216. *Id.*

217. 438 U.S. 104 (1978) (finding no taking when a city restricted the height of a building).

218. *Id.* at 124.

219. 505 U.S. 1003, 1019 (1992).

220. *Id.* at 1029.

221. *See Penn Cent. Transp. Co.*, 438 U.S. at 138.

222. *Sax*, *supra* note 122, at 641.

ulatory takings assertions against shoreline management decisions where those decisions were grounded in common law. For example, in *Stevens v. City of Cannon Beach*, the Oregon court found no takings when the city denied a landowner's request to construct a seawall along the dry beach because, under Oregon law, the landowners never possessed a right to obstruct public access to the dry-sand beach.²²³

As Peter Byrne has argued, in the context of *Lucas*, shoreline regulations "could be upheld if [the regulation] replicated common law principles, but not on the basis that they implement reasonable and necessary protections for the environment and public safety."²²⁴ In the context of shoreline armoring, Jim Titus of the EPA suggests that the public trust doctrine, as a common law principle, would overcome a takings claim under the *Lucas* application.²²⁵ Professor Sax, additionally, posits that states' role as proprietor, as opposed to regulator, should be considered when evaluating a takings challenge.²²⁶

There is little jurisprudence on regulatory takings arising from the ban of shoreline armoring in the Gulf states primarily due to the continued permitting of such structures. But other states banning or limiting the use of hard structures along the shoreline have faced such challenges. For instance, consider the outcome of takings claims in North Carolina and South Carolina following restrictions on shoreline armoring.

a. North Carolina

Through the Coastal Area Management Act, North Carolina prohibits shoreline armoring.²²⁷ Implementing rules provide: "Permanent erosion control structures may cause significant adverse impacts on the value and enjoyment of adjacent properties or public access to and use of the ocean beach, and, therefore, are prohibited. Such structures include bulkheads, seawalls, revetments, jetties, groins and breakwaters."²²⁸ In the 1990s, property

223. See *Stevens v. City of Cannon Beach*, 854 P.2d 449, 460 (Or. 1993).

224. Byrne, *supra* note 123, at 634.

225. *Rising Seas*, *supra* note 49, at 1354-59; see also Caldwell & Segall, *supra* note 198, at 567-68.

226. See Sax, *supra* note 122, at 643-44 (suggesting that a state's legal position as a landowner may be more favorable than as a regulator).

227. N.C. GEN. STAT. § 113A-100 (2010); 15A N.C. ADMIN. CODE 7H.0308(a)(1)(B) (2010) (referred to as the "hardened structure rule" in *Shell Island Homeowners Association v. Tomlinson*, 517 S.E.2d 406, 409 (N.C. Ct. App. 1999)).

228. 15A N.C. ADMIN. CODE 7H.0308(a)(1)(B).

owners unsuccessfully challenged the rule on several grounds, including takings.²²⁹

In *Shell Island Homeowners Association v. Tomlinson*, condo owners sought permits to erect hard structures along Mason's Inlet to protect the resort from erosion.²³⁰ In rejecting property owners' assertions, the court noted that plaintiffs' allegations of property invasion and reduced value "clearly stem[med] from the natural migration of Mason's Inlet"²³¹ The court dispelled with the notion that plaintiffs have a legal right to protect property from erosion.²³² Specifically, "[t]he courts of [North Carolina] have considered natural occurrences such as erosion and migration of waters to be, in fact, natural occurrences, a consequence of being a riparian or littoral landowner, which consequence at times operates to divest landowners of their property."²³³ The court distinguished between the "naturally occurring phenomena" and the regulatory actions of the state, identifying migration and erosion as the primary causes of the condo owner's property loss.²³⁴ Accordingly, the state's enforcement of the regulations was "merely incidental to these naturally occurring events."²³⁵

b. South Carolina

South Carolina restricts shoreline armoring through its Beachfront Management Act.²³⁶ Following Hurricane Hugo, the legislature amended the Act in 1990.²³⁷ As amended, the Act has consistently maintained a policy that embraces beach renourishment, discourages or prohibits construction on or near the active beach, and

229. *Shell Island Homeowners Ass'n v. Tomlinson*, 517 S.E.2d 406, 414 (N.C. Ct. App. 1999); Kalo, *supra* note 126, at 1488-90 (providing a full discussion of littoral rights in North Carolina).

230. *Shell Island Homeowners Association, Inc.*, 517 S.E.2d at 409.

231. *Id.* at 414.

232. *Id.* ("[P]laintiffs have based their takings claim on their need for 'a permanent solution to the erosion that threatens its property,' and the premise that '[t]he protection of property from erosion is an essential right of property owners' The allegations . . . have no support in the law, and plaintiffs have failed to cite . . . any persuasive authority for the proposition[.]").

233. *Id.*

234. *Id.* at 415.

235. *Id.* The resort was erected after the passage of the hardened structure rule and was therefore at all times subject to this regulation. *Id.* at 416.

236. S.C. CODE §§ 48-39-10 to 48-39-360 (2009).

237. S.C. Coastal Conservation League & Sierra Club v. S.C. Dep't of Health & Envtl. Control, 1998 WL 377936, at *3 (S.C. Admin. Law Judge Div. June 16, 1998). Multiple appeals followed this administrative decision, ultimately leading to a ruling that groins were not covered by these provisions. S.C. Coastal Conservation League v. S.C. Dep't of Health & Envtl. Control, 582 S.E.2d 410 (S.C. 2003).

encourages development to retreat from the shoreline,²³⁸ thereby protecting the state's beach/dune system from unwise construction.²³⁹ The Act notes that the use of armoring in the form of seawalls, bulkheads, and rip-rap has not proven effective in reducing coastal erosion; to the contrary, hard erosion control structures make beachfront property more susceptible to erosion while threatening the dry sand beach that drives the state's tourism industry.²⁴⁰ Employing a setback line, South Carolina prohibits new construction of hard erosion control structures seaward, unless the structures are created to protect a public highway.²⁴¹ Existing armoring devices may be maintained in their present condition but may not be enlarged or strengthened.²⁴² After June 30, 2005, any seawall or other hard structure that is more than 50% destroyed may not be rebuilt or replaced and must be removed at the owner's expense.²⁴³ By reducing the number of armoring devices along the beaches, the state contends that beaches will be less vulnerable to damage from wind and wave action and that the beach/dune system will be better protected.²⁴⁴

South Carolina courts have on occasion considered application of the BMA in the context of takings claims. In *Wooten v. South Carolina Coastal Council*, a landowner brought a regulatory takings claim against the Coastal Council after being denied a permit to construct a bulkhead.²⁴⁵ In 1991, Wooten applied for a permit to bulkhead a lot she received as a gift from her mother in 1988.²⁴⁶ Wooten sought to fill 85% of her land to build a house, and thus the bulkhead was "not merely to control erosion."²⁴⁷ After the permit was denied, Wooten filed suit in 1994 claiming that the permit denial changed her useable property interest after she had acquired the property.²⁴⁸ The court held that Wooten's property was

238. See S.C. CODE §§ 48-39-250, 48-39-260, 48-39-280(A) (2009); see also S.C. CODE REGS. § 30-1(B) (2010) (acknowledging state policy to protect tidelands, the development pressures occurring in tidelands, and the need to evaluate a range of alternatives when considering development in these areas).

239. S.C. CODE § 48-39-250(11) (2009).

240. *Id.* § 48-39-250(5).

241. *Id.* § 48-39-290(B)(2)(a). To determine the depth of the setback line, the beach's average annual erosion rate is calculated and multiplied by forty. This distance is then measured inland of the baseline, the most landward point of erosion at any time during the past forty years, to establish the actual location of the setback line. *Id.* § 48-39-280(B).

242. *Id.* § 48-39-290(B)(2)(b)(vi).

243. *Id.* §§ 48-39-290(B)(2)(b)(iii)-(c). See also, Hollis Inabinet, Comment, *Finding Common Ground on Shifting Sands: Coastal Zone Regulatory Bodies, Governance, and Program Effectiveness in South Carolina*, 17 SOUTHEASTERN ENVTL. L.J. 429 (2009) (providing an overview of coastal management in South Carolina).

244. S.C. CODE § 48-39-260.

245. *Wooten v. S.C. Coastal Council*, 510 S.E.2d 716, 717 (S.C. 1999).

246. *Id.*

247. *Id.* at 718.

248. *Id.* at 717.

subject to the restriction on use when she acquired title after the 1977 enactment of the Coastal Zone Management Act.²⁴⁹ Because “[t]he proscribed use interests were not part of Wooten’s title when she acquired the property,” no compensable regulatory taking had resulted from the denial of the permit.²⁵⁰

Later, in *McQueen v. South Carolina Coastal Council*, the court again considered whether a permit denial for a bulkhead constituted a compensable taking.²⁵¹ McQueen purchased two lots in the early 1960s, and the lots remained unimproved until McQueen sought a permit to bulkhead his lots in 1991.²⁵² By the early 1990s, both lots were substantially “tidelands or critical area saltwater wetlands[,]” as a result of naturally-occurring erosion.²⁵³ The permit sought to backfill the areas, permanently destroying the critical area environment on the lots.²⁵⁴ The Council denied McQueen’s bulkhead permit, which would allow for the land to be developed.²⁵⁵ McQueen alleged that the permit denial constituted a regulatory taking.²⁵⁶

After a lengthy appeal process,²⁵⁷ the case was remanded back to South Carolina by the U.S. Supreme Court for reconsideration in light of *Palazzolo v. Rhode Island*.²⁵⁸ In *Palazzolo*, the Supreme Court held that a pre-existing regulation was not, in itself, dispositive “either in the context of determining ownership rights under background principles of state law or in determining the investment-backed expectation factor in a partial taking.”²⁵⁹ Stipulating that McQueen suffered a total taking of his property, the South Carolina court considered whether background principles of South Carolina law absolved the state from compensating McQueen.²⁶⁰ Because McQueen’s property had reverted to tidelands prior to his

249. *Id.* See also *Beard v. South Carolina Coastal Council*, 403 S.E.2d 620, 622 (S.C. 1991) (holding that denial of permit for primary reason that proposed construction would have violated Coastal Zone Management Act did not result in unconstitutional taking of area between existing wall and proposed wall).

250. *Wooten*, 510 S.E.2d at 718; see also, Douglas T. Kendall, *Preserving South Carolina's Beaches: The Role of Local Planning in Managing Growth in Coastal South Carolina*, 9 S.C. ENVTL. L.J. 61, 75 (2000).

251. *McQueen v. South Carolina Coastal Council*, 580 S.E.2d 116, 117 (S.C. 2003).

252. *Id.* at 118.

253. *Id.*

254. *Id.*

255. *Id.*

256. *Id.*

257. See Jennifer Dick & Andrew Chandler, *Shifting Sands: The Implementation of Lucas on the Evolution of Takings Law and South Carolina's Application of the Lucas Rule*, 37 REAL PROP. PROB. & TR. J. 637, 669-73 (2003), for a discussion of the *McQueen* case history prior to this decision.

258. *McQueen*, 580 S.E.2d at 118; see also *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001) (involving a partial takings of property including wetlands in Rhode Island).

259. *McQueen*, 580 S.E.2d at 119 (citing *Palazzolo*, 533 U.S. at 626, 629-30).

260. *Id.*

application for a permit to construct a bulkhead and fill in these lands, the tidelands had become public trust property subject to state ownership.²⁶¹ Therefore, the court held that McQueen did not have a property right to fill in these lands, and the state need not compensate McQueen for refusing to grant him a permit to do what he cannot otherwise lawfully do.²⁶² “Any taking McQueen suffered is not a taking effected by State regulation but by the forces of nature and McQueen’s own lack of vigilance in protecting his property.”²⁶³

Although South Carolina’s shoreline regulations are primarily aimed at beach preservation, the preceding cases suggest that South Carolina could apply similar restrictions to non-beach shorelines without incurring compensable takings of private property. Prior to *Palazzolo*, South Carolina case law indicated that any landowner taking title after enactment of the Coastal Zone Management Act may lack reasonable investment-backed expectations because of pre-existing wetland regulations.²⁶⁴ However, as discussed, this notion was rejected by the Supreme Court in *Palazzolo*.²⁶⁵ The *McQueen* decision nevertheless suggests that the public trust doctrine, as a background principle of South Carolina property law, may relieve the state from compensating landowners for restricting the use of bulkheads and other shoreline armoring techniques.²⁶⁶

2. Other Takings Challenges to Shoreline Development in the Gulf of Mexico

Within the Gulf states, there is little case law addressing regulatory takings claims in the context of shoreline armoring. However, Florida, with the most developed shoreline management requirements, has on occasion addressed the issue of takings claims in the context of denials of other types of coastal development permits. Florida courts have consistently held that an unlawful taking will not be established merely because a state agency denies a permit for a particular use that is the most profitable or

261. *Id.* at 120.

262. *Id.*

263. *Id.*

264. *Id.* at 118.

265. *Palazzolo v. Rhode Island*, 533 U.S. 606, 626, 630 (2001).

266. *McQueen*, 580 S.E.2d at 119. *But see* S.C. Coastal Conservation League v. S.C. Dep’t of Health and Env’tl. Control, 582 S.E.2d 410, 413 (S.C. 2003) (holding that groins are not considered hard erosion control structures, which are statutorily limited to seawalls, bulkheads, and revetments).

desirable to the property owner.²⁶⁷ Moreover, as long as some economically viable use can be made of the property as a whole, a permit denial typically will not constitute a taking.²⁶⁸ State agencies have the responsibility to balance the health and safety of the public and the private property rights of the landowner; accordingly, when considering granting coastal development or armoring permits to landowners, agencies reserve the right to deny such permits when the resulting construction threatens injury to the public.²⁶⁹

Several cases, decided prior to *Lucas*, considered takings claims resulting from the landowner being denied permission to construct a bulkhead. In *State Department of Environmental Regulation v. Schindler*, the court articulated the “parcel as a whole” standard.²⁷⁰ There, a landowner distinguished between 1.65 acres of uplands and 1.85 acres of wetlands on his property, claiming that the denial of a permit to construct a bulkhead constituted a taking of the submerged portions of his property.²⁷¹ Schindler contended that the submerged lands could be of no commercial use without the construction of the bulkhead and permit to fill the land.²⁷² The court found that, to determine if a taking of private property has occurred, the proper focus is on the “extent of the [state’s] interference with the landowner’s rights in the parcel *as a whole*” and that a taking will not necessarily occur simply because the state denied a permit that would have benefited the landowner.²⁷³ Under a previous owner, the upland portions of the property contained two rental properties, and an environmental management consultant testified that the submerged property complemented upland property through the installation of boardwalks, gazebos, or fishing piers.²⁷⁴ These facts indicated that the property could, as a whole, be economically viable in the absence of the bulkhead and without the proposed filling in of the submerged area; therefore, as a whole, the property still had reasonable economic use, even though the use is not that which the owner considered most profitable.²⁷⁵

267. See *Graham v. Estuary Props., Inc.*, 399 So. 2d 1374, 1383 (Fla. 1981) and *Key Haven Associated Enters., Inc. v. Bd. of Trs. of Internal Improvement Trust Fund*, 427 So. 2d 153, 159-60 (Fla. 1983).

268. *Dep’t of Env’tl. Reg. v. Mackay*, 544 So. 2d 1065, 1066 (Fla. 3d DCA 1989).

269. See *Graham*, 399 So. 2d at 1377, 1381.

270. 604 So. 2d 565, 568 (Fla. 2d DCA 1992).

271. *Id.* at 567.

272. *Id.*

273. *Id.* at 568 (quoting *Fox v. Treasure Coast Reg’l Planning Council*, 442 So. 2d 221, 225 (Fla. 1st DCA 1983)).

274. *Id.* at 567.

275. *Id.* at 568.

Also, in *Graham v. Estuary Properties, Inc.* (another pre-*Lucas* decision), a landowner sought permission for a proposed development project that called for the destruction of 1,800 acres of black mangroves to create a 7.5-mile interceptor waterway.²⁷⁶ Estuary Properties claimed that the function of the destroyed mangroves in the ecosystem would be replaced by the installation of the waterway; however, both the Lee County Board of Supervisors and the Florida Land and Water Adjudicatory Commission found that the destruction of the mangroves would negatively impact the region and consequently denied the permit.²⁷⁷ Estuary claimed that the denial constituted an unlawful taking of its property because, without the proposed waterway, it could derive no economic benefit from the land.²⁷⁸ The court held that “[t]he owner of private property is not entitled to the highest and best use of his property if that use will create a public harm[.]” thus, Estuary Properties was not entitled to construct the waterway if such construction polluted the neighboring bays.²⁷⁹ Moreover, the Commission’s refusal to allow the waterway was not a refusal to allow any development on the property whatsoever; Estuary Properties would still have been allowed to develop the property, provided that the mangroves were not destroyed in the process.²⁸⁰ Though the interceptor waterway would increase the value of the property, its disallowance did not constitute a taking because its creation would result in pollution and, thus, cause injury to the public.²⁸¹

Applying *Graham*, the court in *Fox v. Treasure Coast Regional Planning Council* likewise found no compensable taking where a landowner’s permit request to construct a retirement community on a parcel of land containing wetlands required the wetland area be preserved.²⁸² Per *Graham*, the state must balance the public welfare with the landowner’s property interests in permitting future developments, and property owners are not entitled to the highest and best use of their property if such use creates a public harm.²⁸³ Accordingly, the state acted within its power to deny a landowner’s request to develop a portion of his property without

276. 399 So. 2d 1374, 1376 (Fla. 1981).

277. *Id.* at 1376-77.

278. *Id.* at 1382.

279. *Id.* (citing *Goldblatt v. Town of Hempstead*, 369 U.S. 590 (1962)).

280. *See id.*

281. *Id.*

282. 442 So. 2d 221, 225 (Fla. 1st DCA 1983).

283. *Id.* at 226.

compensation, provided that the land, taken as a whole, still has a reasonable economic use.²⁸⁴

In a converse scenario, the U.S. Supreme Court, construing Florida property law, recently ruled that a state's beach nourishment projects did not constitute a taking of the littoral property owner's rights.²⁸⁵ While "[s]tates effect a taking if they recharacterize as public property what was previously private property[.]" Florida's placement of sand upon state owned submerged lands did not merit a taking because the submerged lands were state property.²⁸⁶ Even though the fill of submerged lands separated the littoral property line from the water's edge, no taking occurred.²⁸⁷ In reaching this conclusion, the Court relied on two principles of property law: 1) "the State as owner of the submerged land adjacent to littoral property has the right to fill that land, so long as it does not interfere with the rights of the public and the rights of littoral landowners[.]" and 2) "if an avulsion exposes land seaward of littoral property that had previously been submerged, that land belongs to the State even if it interrupts the littoral owner's contact with the water."²⁸⁸ Finding no exceptions to these rules in Florida property law, the Court concluded that the littoral property owners had suffered no taking of their property.²⁸⁹ Applying this concept to a bulkheading restriction, however, may prove difficult since the landowner stands to lose property through erosion unless given an alternative means of erosion control, such as living shorelines.

Taking these decisions in context with other Supreme Court takings jurisprudence,²⁹⁰ a regulation that bans shoreline armoring is unlikely to result in a regulatory taking so long as certain criteria are met. First, *Lucas* provides that the regulation cannot destroy all economic value causing a per se taking. As others have observed, preventing bulkheading will not effectuate an immediate destruction in value but will instead allow erosion to take place slowly over time.²⁹¹ Likewise, the North Carolina decision in *Shell*

284. *See id.* If the landowner can still use his property as a whole in an economically viable manner, then no taking has occurred, despite the fact that the state has prohibited development on certain portions of the land in question.

285. *Stop the Beach Renourishment, Inc. v. Dep't of Env'tl. Prot.*, 130 S. Ct. 2592, 2612 (2010).

286. *Id.* at 2601 (citing *Webb's Fabulous Pharmacies, Inc. v. Beckwith*, 449 U.S. 155, 163-65 (1980)).

287. *Id.* at 2612.

288. *Id.* at 2611.

289. *Id.* at 2612 (noting that the State did not relocate the property line).

290. *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003 (1992); *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001).

291. *See Shell Island Homeowners Ass'n v. Tomlinson*, 517 S.E.2d 406, 414-15 (N.C. Ct. App. 1999).

Island specifically acknowledged that the property loss was the result of a naturally occurring process, and the state's regulation was merely incidental.²⁹² Even where an anti-armoring ban may destroy all economic value, governments may overcome takings claims where the regulation is grounded in either common law nuisance or background principles of law.²⁹³ By relying on the state's public trust doctrine as a background principle of law, regulations banning armoring in efforts to preserve the land/water interface could successfully survive takings claims.²⁹⁴ Second, where the regulation does not effect a *per se* taking, it will be evaluated on a case-by-case basis utilizing the *Penn Central* balancing test.²⁹⁵ The court will consider a property owner's reasonable expectations and the government's action (in this instance, action to preserve public trust land), along with the economic impact of the regulation.²⁹⁶ In this context, a state's public trust obligations weigh in favor of restrictions on shoreline armoring.²⁹⁷ Additionally, incorporating living shorelines into the regulatory process provides the property owner with an alternative erosion control measure, mitigating the impact of armoring restrictions.

IV. CONCLUSION

While many states pay detailed attention to beach preservation, far less consideration is afforded to shoreline management along bays and estuaries. If the current trend of bulkheading continues, the Gulf of Mexico coastline stands to lose substantial quantities of existing marshes and wetlands.²⁹⁸ As goes the marsh, so go the numerous environmental and social benefits such as habitat preservation, water quality, and fishing opportunities.²⁹⁹ Given the correlation between the rate of bulkheading and land development, the proper solution to natural shoreline preservation should include a multifaceted approach—one that restricts shoreline armoring in favor of living shorelines while at the same time addresses land use policies promoting development along the coastline. For instance, changes to the National Flood Insurance Policy, which currently subsidizes flood insurance in high-risk are-

292. *Id.* at 415.

293. *Lucas*, 505 U.S. at 1029.

294. Caldwell & Segall, *supra* note 198, at 567-68; *Rising Seas*, *supra* note 49, at 1356-61.

295. *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528, 538-39 (2005) (citing *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978)).

296. *Penn Cent. Transp. Co.*, 438 U.S. at 124.

297. *See id.* at 138.

298. *See Tide Doesn't Go Out*, *supra* note 75, at 23-25.

299. *See id.*

as, could potentially reduce the development pressures along the shore, thereby reducing the rate of new shoreline armoring.³⁰⁰ Combining changes to land-use development policies with new shoreline regulations will offer greater protection to existing natural shorelines.

One certainty exists. Managing the ambulatory nature of property rights along the shoreline will continue to present unique challenges.³⁰¹ As sea levels rise and tidal waters encroach further upon private waterfront properties, regulatory difficulties will likely increase, leaving state and local governments to find an appropriate balance between public and private interest in the shore.

300. See *The Sea is Rising*, *supra* note 27, at 769-70.

301. See Sax, *supra* note 122, at 647.

