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An Increase in Beach Reconstruction Projects May Mean a Decrease in Property Rights: The Need for a Multi-Factor Balancing Test when Protecting Waterfront Property

Amy Forman

Washington and Lee University School of Law

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An Increase in Beach Reconstruction Projects May Mean a Decrease in Property Rights: The Need for a Multi-Factor Balancing Test when Protecting Waterfront Property

Amy Forman*

Abstract

In recent years, many states have struggled to come up with an adequate solution to the negative effects of climate change, specifically rising sea levels and severe storms. The most common and successful method of protection, erecting barriers on the waterfront, not only raises its own environmental concerns, but also forces the government to invade on a homeowner's property rights for the sake of protecting the beach. Recent cases such as the *Borough of Harvey Cedars v. Karan*, illustrate that when courts abandon traditional property rights, it becomes easier to implement protective measures and save their waterfront properties. This protection comes at a cost, however, as many of these protective methods end up causing long-term environmental harm. On the other hand, if courts choose to respect all traditional property rights, it avoids any detrimental impact those structures would have on the environment but fails to offer any protection to waterfront properties. Courts must find a way to balance both the property concerns and environmental concerns. This can be done through a multi-factor balancing test, including the following three questions: (1) are there other more environmentally friendly alternatives that can be implemented; (2) does the value of damage done to the environment outweigh the value of protecting the homeowner receives; and (3) will

* Amy Forman (forman.a@law.wlu.edu) is a J.D. candidate at Washington & Lee University School of Law, May 2015, and a Senior Articles Editor for the Journal of Energy, Climate, and the Environment. Amy would like to thank Professor Christopher Seaman for his guidance and encouragement throughout this writing process.

denial of this protective measure cause imminent, rapid, or sudden loss of property? This test will weigh the interests of both property and environmental issues to determine when it is adequate to compromise traditional property rights and which protective measures are permissible.

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I. Introduction

It has become increasingly evident that the effects of climate change on the United States’ beaches and wetlands are

creating a crisis.¹ Many states today find themselves fighting a fierce battle in an attempt to deal with the increasing problems associated with rising sea levels and the increase in devastating storms.² In attempts to prevent further damage, waterfront property owners have found themselves in court battling over the issue of protecting their property at the expense of some of their traditional property rights.³

In recent years, the effects of climate change have been increasingly detrimental to beaches.⁴ Climate change has caused a rise in sea levels and an increase in beach erosion.⁵ As a result, both environmental resources and infrastructures are being destroyed at an alarming rate.⁶ Additionally, by warming sea temperatures, climate change is causing an increase in the frequency and severity of coastal storms.⁷ These coastal storms have the power to destroy whole towns.⁸

1. See Thomas Ruppert, *Reasonable Investment-Backed Expectations: Should Notice of Rising Seas Lead to Falling Expectations for Coastal Property Purchasers?*, 26 J. LAND USE & ENVTL. LAW 239, 239–40 (2011) (discussing the worsening conditions associated with rising sea levels and the challenges presented in finding a solution).

2. See 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, 733 (2000) (discussing the primary responses to sea levels rising).

3. See generally *Borough of Harvey Cedars v. Karan*, 70 A.3d 524 (N.J. 2013) (assessing whether compensation is owed to landowners who actually benefit from a taking to protect beachfront property).

4. See Elizabeth C. Black, *Climate Change Adaptation: Local Solutions for a Global Problem*, 22 GEO. INT'L L. REV. 360, 368 (2010) (discussing the difficult consequences of climate change).

5. See *id.* at 374–76 (examining the increase in beach erosion).

6. See J. Peter Byrne, *The Cathedral Engulfed: Sea-Level Rise, Property Rights, and Time*, 73 LA. L. REV. 69, 77 (2012) (discussing the environmental consequences of rising sea levels).

7. See *Sea Temperature Rise*, NATIONAL GEOGRAPHIC (last visited Mar. 2, 2014), <http://ocean.nationalgeographic.com/ocean/critical-issues-sea-temperature-rise/> (“Warmer surface water dissipates more readily into vapor, making it easier for small ocean storms to escalate into larger, more powerful systems.”) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

8. See *Hurricane Sandy Fast Facts*, CNN (Nov. 5, 2014, 12:10 PM), <http://www.cnn.com/2013/07/13/world/americas/hurricane-sandy-fast-facts/> (chronicling Hurricane Sandy’s destruction on the east coast) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

Towns located along shorelines are using beach reconstruction and replenishment projects to fight back against the damages caused by climate change.⁹ These projects involve the state or local government constructing sea walls, dunes, or some type of barrier on private property and require the government to obtain an easement from the property owner.¹⁰ When the property owner refuses to grant the easement, the governments must exercise its eminent domain power.¹¹ Issues surrounding property rights have resulted in an increase in litigation.¹² The increase in litigation combined with the need for immediate relief has led many courts to compromise or reduce traditional property rights.¹³ Recently, in *Borough of Harvey Cedars v. Karan*, the New Jersey Supreme Court dramatically reduced the amount awarded to beachfront property owners by altering the traditional calculation method used to determine just compensation to include general benefits.¹⁴ The New Jersey

9. See Mark Di Ionno, *Hurricane Sandy Recovery Still a Work in Progress*, THE STAR-LEDGER (Oct. 30, 2014, 7:04 AM), http://www.nj.com/news/index.ssf/2014/10/hurricane_sandy_recovery_still_a_work_in_progress_di_ionno.html (reporting on the beach reconstruction efforts in New Jersey towns after Hurricane Sandy) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

10. See Wayne Parry, *Fight Over Beach Sand Gets Dirty*, NBC (Apr. 11, 2010, 12:17 PM), http://www.nbcnews.com/id/36390707/ns/us_news-environment/#.UwuZ6P0qDwI (discussing the need for the U.S. Army Corps of Engineers to obtain easements from the oceanfront homeowners) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

11. See Rachel S. Meystedt, Note, *Stop the Beach Renourishment: Why Judicial Takings May Have Meant Taking a Little Too Much*, 18 MO. ENVTL. L. & POL'Y REV. 378, 391 (2011) (discussing the government's power under the doctrine of eminent domain).

12. See Michael A. Hiatt, Note, *Come Hell or High Water: Reexamining The Takings Clause In a Climate Changed Future*, 18 DUKE ENVTL. L. & POL'Y F. 371, 371 (2008) (examining how large-scale sea level rise is causing a collision in property rights with the takings clause and public trust doctrine).

13. See Keith Goldberg, *Energy Boom Tests State Eminent Domain Laws*, LAW360 (May 12, 2014, 2:16 PM), <http://www.law360.com/articles/535660/energy-boom-tests-state-eminent-domain-laws> (discussing an increase in litigation and scrutiny over eminent domain laws) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

14. See *Borough of Harvey Cedars v. Karan*, 70 A.3d 524, 543 (N.J. 2013) (holding that calculation of just compensation must include benefits that the homeowner obtained from dunes built for storm protection).

Supreme Court and other courts severely overlook the implications of compromising traditional property rights—both on property law and the environment.¹⁵

When a state or local government is only required to pay a minimal amount of compensation, it becomes easier for the government to construct sea walls and other barriers.¹⁶ While the protective barriers provide immediate relief to the oceanfront property, the environmental damage they cause is extensive and long-term.¹⁷ These protective barriers have been found to actually increase beach erosion and destroy animal habitat.¹⁸ Additionally, the protective barriers are expensive to construct and only provide temporary protection.¹⁹

Courts need to find a balance between property owner's need for immediate relief from the damages caused by climate change and protecting the environment from further destruction. When judges alter traditional property rights, making beach protective barrier construction easier for states, this Note argues that they ignore long-term environmental costs.²⁰ If, however, courts continue to follow the traditional just compensation calculation method, most beach protection projects will be too expensive to implement.²¹ Property owners will suffer extreme damage to their property and possibly lose their beaches all together.

15. See *infra* Part V (suggesting a better way to analyze these cases).

16. See Tracey Samuelson, *New Jersey Supreme Court sides with Harvey Cedars in the Dune Compensation Case*, NEW WORKS (July 8, 2013), <http://www.newworks.org/index.php/local/new-jersey/57029-nj-supreme-court-sides-with-harvey-cedars-in-dune-compensation-case> (discussing the possibility of beach replenishment projects becoming too expensive to implement if courts do not consider general benefits) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

17. See *infra* Part IV.A (discussing sea walls and other forms of armoring as a response to climate change).

18. See *infra* Part IV.A (explaining that erosion actually increases when sea walls are used).

19. See *infra* Part IV.A (examining how the costs of sea walls outweigh the benefits).

20. See *infra* Part V (discussing a more equitable solution, a multi-factor balancing test).

21. See *infra* Part III.D (discussing the aftermath of *Borough of Harvey Cedars v. Karan*).

When beachfront property owners face a likelihood of an imminent threat to their property, as a general rule court should apply the holding in *Harvey Cedars*. In these cases, courts should consider general benefits and special benefits when calculating just compensation.²² The holding in *Harvey Cedars* is not universally applicable to all eminent domain cases involving beach reconstruction and replenishment projects.²³ When denial of the protective barrier does not cause a likely imminent threat to the oceanfront property, courts should adopt a multi-factor balancing test to help weigh the property concerns with the environmental issues.²⁴ When applying this multi-factor balancing test, courts should consider: (1) whether there are other more environmental friendly alternatives that can easily be implemented and (2) whether the costs of implementing the constructive barrier can be justified.²⁵

Part II of this Note will address the causes behind the destruction of our beaches and how this has developed into the pressing issue it is today.²⁶ This Part will also discuss how property law is intertwined with this issue and how certain aspects of property law, specifically takings, are being used as a response to the problem.²⁷ Part III will discuss the recent New Jersey case *Harvey Cedars v. Karan* in relation to the issue of compromising property rights at the expense of the environment.²⁸ Part IV will critique the legal outcome in *Harvey Cedars* and discuss how the courts may have improperly weighed the competing interests.²⁹ Part V will discuss a multi-factor balancing test that presents a more equitable solution to issues

22. See *infra* Part III (suggesting use of the Court's reasoning in *Borough of Harvey Cedars v. Karan*).

23. See *infra* Part IV (discussing why *Harvey Cedars v. Karan* should not be universally applied).

24. See *infra* Part IV (discussing the applicability of the *Harvey Cedars v. Karan* to other jurisdictions).

25. See *infra* Part V (proposing a multi-factor balancing test).

26. See *infra* Part II (explaining the current environmental concerns and its history).

27. See *infra* Part II (discussing the intersection of property law and environmental concerns).

28. See *infra* Part III (noting the most recent and relevant case to the subject at hand).

29. See *infra* Part IV (analyzing the *Harvey Cedars v. Karan* case).

that arise in these situations similar to the one in *Harvey Cedars*.³⁰

II. Environmental Concerns/Property Law

A. The Explanation for the Increase in Beach Erosion, Rising Sea Levels, and More Frequent Coastal Storms

Today state and local governments find themselves forced to address the inevitable consequences of climate change—which include rising sea levels and severe storms.³¹ In the 2009 Climate Impact Report, the United States Global Change Research Program stated that climate change is caused by the emission of greenhouse gases and the accumulation of these gases in the atmosphere.³² Scientists have determined the emissions of carbon dioxide and other gases will significantly warm the Earth in the next century.³³ Greenhouse gases allow energy from the sun into the Earth's atmosphere but prevent it from escaping—thus causing polar ice to melt, a reduction in the reflection of sun's rays, and warmer seawater through the absorption of more of the sun's energy.³⁴

30. See *infra* Part V (proposing a better, more relevant test than the one suggested in *Harvey Cedars v. Karan*).

31. See Black, *supra* note 4, at 368–73 (providing examples of how New York City, Cape Town, and London have addressed climate change).

32. See U.S. GLOBAL CHANGE RESEARCH PROGRAM, GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES 19 (2009), available at <http://ccsl.iccip.net/climate-impacts-report.pdf> (discussing the causes of climate change) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

33. See WORKING GROUP I, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 1995: THE SCIENCE OF CLIMATE CHANGE, 84–85 (1996) [hereinafter IPCC] (stating that “all models” create such a projection); 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, 718 (2000) (“Scientists throughout the world, as well as the U.S. Government, have concluded that emissions of carbon dioxide and other gases will warm the Earth 1.03.05 degrees Celsius in the next century.”).

34. See U.S. GLOBAL CHANGE RESEARCH PROGRAM, *supra* note 32, at 17–18.

As a result of melting ice and increased water temperatures, the Intergovernmental Panel on Climate Change estimated that sea levels will rise approximately two feet per century for the next few hundred years, with the possibility of rising as much as fifteen feet by the year 2200.³⁵ This rise in the sea level is significant enough to destroy both environmental resources and infrastructures by eroding or inundating beaches and coastal wetlands.³⁶

In addition to rising sea levels, the United States is faced with the threat of increasing coastal storms.³⁷ As a consequence of the rise in sea temperatures, coastal storms are expected to increase in number and severity.³⁸ Specifically, the warmer surface water dispels more readily into vapor, making smaller storms become larger and more powerful.³⁹ Future storms will have “larger peak wind speeds and more heavy precipitation.”⁴⁰ As a result, the greenhouse warming will cause more intense hurricanes with a higher rainfall rate.⁴¹ “With climate change,

35. See IPCC, *supra* note 33 (discussing the future effects of rising sea levels).

36. See Byrne, *supra* note 6, at 77 (discussing the environmental consequences of rising sea levels).

37. See Black, *supra* note 4, at 364 (discussing the dangers of flooding with the increase in coastal storm severity).

38. See *Sea Temperature Rise*, *supra* note 7 (listing stronger storms as an effect of higher sea temperatures).

39. See *id.* (“Warmer surface water dissipates more readily into vapor, making it easier for small ocean storms to escalate into larger, more powerful systems.”).

40. See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SUMMARY FOR POLICYMAKERS, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 2 (2007), available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf> [hereinafter IPCC 2] (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT); see also John R. Nolon, *Regulatory Takings and Property Rights Confront Sea Level Rise: How Do They Role*, 21 WIDENER L. REV. 735, 741 (2012) (“Specifically, these future tropical cyclones will have larger peak wind speeds and more heavy precipitation associated with ongoing increases of tropical sea-surface temperature.”).

41. See Nolon, *supra* note 41 (“Current research on climate change and hurricanes has indicated that ‘it is likely that greenhouse warming will cause hurricanes in the coming century to be more intense globally and have higher rainfall rates than present-day hurricanes.’”).

what traditionally have been '100-year floods' may become 10-year floods."⁴²

The consequences of rising sea levels and these powerful coastal storms are troubling. On the environmental side, there has been an increase in the erosion and loss of coastal islands, wetlands, and sand dunes.⁴³ Although the exact impact of sea level rise is uncertain, in recent years it has been discovered that the effects of rising sea levels on coastal wetlands are more destructive than previously thought.⁴⁴ Additionally, several coastal property owners are now faced with threats of flooding due to the increase in frequency and severity of coastal storms.⁴⁵ This flooding also has the ability to damage dams, levees, roads, sewers, subways, and airports.⁴⁶

Coastal communities who choose to ignore the rising sea levels do so "at their own peril."⁴⁷ Without state action, it is inevitable that private and public property will be physically destroyed.⁴⁸ Many of the consequences of climate change are irreversible.⁴⁹ It is difficult to determine what the actual effects of climate change will be or predict the scale on which they will

42. MICHAEL HUBER, REFORMING THE UK FLOOD INSURANCE REGIME: THE BREAKDOWN OF A GENTLEMAN'S AGREEMENT 9 (ESRC Centre for Analysis of Risk and Regulation, Discussion Paper No. 18, 2004), *available at* core.ac.uk/download/pdf/219237.pdf (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY, CLIMATE, AND THE ENVIRONMENT).

43. *See* Byrne, *supra* note 6, at 77 (discussing the consequences of rising sea levels).

44. *See* Niki L. Pace, *Wetlands or Seawalls? Adapting Shoreline Regulations to Address Sea Level Rise and Wetland Preservation in the Gulf of Mexico*, 26 J. LAND USE & ENVTL. L. 327, 333 (2011) (discussing a new study released in 2010 suggesting "that coastal wetlands are more sensitive to destruction by rising sea levels than previously thought").

45. *See* Black, *supra* note 4, at 364 ("Flooding already is a significant threat, and its risks will only increase as severe storms become more frequent.").

46. *See id.* at 365 (discussing the damage storm-related flooding can have).

47. *See* Pace, *supra* note 44, at 330 (discussing the visible impacts of climate change).

48. *See* Byrne, *supra* note 6, at 69 (discussing the effects inundation and storm surges will have on property).

49. *See* Black, *supra* note 4, at 360 ("[T]he consequences of climate change are already irreversible.").

occur.⁵⁰ Additionally, sea levels are predicted to continue rising at a steady pace in the future.⁵¹ Thus, state and local governments are forced to come up with effective solutions to this problem immediately.⁵²

In response, waterfront property owners, as well as state governments, have chosen to fight back and protect their property through methods such as beach nourishment and armoring.⁵³ Beach nourishment involves replacing additional sand on eroded beaches.⁵⁴ Numerous states have initiated programs to place additional sand on their beaches.⁵⁵

Armoring involves building hard structures, such as bulkheads, sea walls, groins, and revetments, along the shoreline.⁵⁶ Armoring is used to forestall the negative effects of climate change by acting as a barrier to the sea.⁵⁷ These structures “eliminate the intervening beach, wetlands, and other intertidal zones, but leave the dry land relatively unaffected.”⁵⁸ In many coastal areas, such as California, coastal landowners have relied largely on armoring to protect their property.⁵⁹ There are two different types of armoring: hard armoring and soft armoring. Hard armoring involves the use of constriction

50. See *id.* at 360 (“[I]t is extremely difficult to predict what the actual effects will be and on what scale they will occur.”).

51. See David Rusk, Comment, *Fix It or Forget It: How the Doctrine of Avulsion Threatens the Efficacy of Rolling Easements*, 51 HOUS. L. REV. 291, 298 (2013) (“Sea levels have risen over the last decades and are projected to continue rising at a steady pace.”).

52. See Black, *supra* note 4, at 368 (discussing the difficult consequences of climate change and rising sea levels).

53. See Pace, *supra* note 44, at 328 (“[W]aterfront property owners, in hopes of beating back erosion and rising seas, are frequently erecting hard structures along the water’s edge.”).

54. See *id.* at 337 (discussing the practice of beach nourishment).

55. See Titus, *supra* note 33, at 733 (explaining the primary responses to sea level rise).

56. See Pace, *supra* note 44, at 338 (discussing shoreline armoring and its impact on the environment).

57. See 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, 540 (2007) (explaining how armoring leaves beaches unable to retreat before the rising sea).

58. Titus, *supra* note 33, at 733.

59. See Todd T. Cardiff, Comment, *Conflict in the California Coastal Act: Sand and Seawalls*, 38 CAL. W. L. REV. 255, 255 (2001) (“Coastland landowners in California are building seawalls at an alarming rate.”).

materials, such as steel and concrete.⁶⁰ Soft armoring, however, involves the use of natural and living materials to restore beaches and build sand dunes.⁶¹ Towns have found themselves dealing heavily in property law as a result of this new reliance on armoring.⁶²

B. Using Property Law as a Response

Numerous towns located along the shorelines facing erosion and destructive coastal storms hope to implement beach reconstruction and replenishment projects immediately. In order to be effective, these protective measures will have to intrude into private oceanfront property. States are required to obtain the consent of oceanfront homeowners to a loss of their land.⁶³ Thus, the homeowners' property rights and the state's authority under the Constitution to take private land play a vital role in beach reconstruction projects.

The Takings Clause of the Fifth Amendment of the United States Constitution provides that no "private property be taken for public use, without just compensation."⁶⁴ Essentially, the Fifth Amendment grants the government right to physically take possession of property, under the conditions that it is for public use and the property owner receives just compensation.⁶⁵ The

60. See Byrne, *supra* note 6, at 86 (discussing hard armoring and the materials used in its creation).

61. See *id.* (discussing soft armoring and the materials used in its creation).

62. See *id.* (stating that towns are finding themselves using property law for this purpose)

63. See Parry, *supra* note 10 (stating that the United States Army Corps of Engineers cannot move forward with its beach project until all oceanfront property owners have signed easements permitting new sand to be pumped onto their personal property).

64. See U.S. CONST. amend. V ("[N]or shall private property be taken for public use, without just compensation").

65. See Byrne, *supra* note 6, at 85 (stating that the Fifth Amendment was "intended to condition the exercise of eminent domain on compensation. Understandably it was extended to require compensation when the government otherwise physically takes possession of property without the formalities of condemnation.").

government may take private property either through a regulatory taking or through the right of eminent domain.⁶⁶

One type of regulatory taking, a *per se* taking, occurs when the government permanently invades on a private property owner's right to exclusive possession or the owner's right to exclude others from his private property.⁶⁷ Eminent domain is the government's sovereign power to take property from private landowners.⁶⁸ If the government takes private property for public use, but pays the property owner just compensation, the taking is considered constitutional under the government's eminent domain authority.⁶⁹ States have begun to exercise their power that flows from the *per se* takings doctrine and eminent domain to compel waterfront property owners to permit the town to build "shields" from the destructive effects of rising sea levels and devastating storms on private property.⁷⁰

These projects cannot begin until all oceanfront property owners have signed easements permitting the state to either pump additional sand onto their property or build protective structures along the edge of their property.⁷¹ Many oceanfront property owners willingly sign the easements.⁷² Numerous people, however, have refused to sign the easements fearing the government might find other uses for their property, such as

66. See Meystedt, *supra* note 11, at 386 ("Under current property law, the government may take the property of an individual either through a regulatory taking or through the right of eminent domain.").

67. See *id.* at 386 (discussing and defining the two types of regulatory takings).

68. See Tiffany Anne Douglas, Note, *Florida's Take on Takings: An Appeal to Re-Balance the Individual's Rights and the State's Needs*, 4 FL. COASTAL L.J. 207, 207 (2003) (discussing the power of eminent domain and its constitutional limits).

69. See Meystedt, *supra* note 11, at 387 ("If the government takes private land for public use but pays the property owner just compensation, the taking is constitutional under the right of eminent domain.").

70. See Kate Zernike, *Trying To Shame Dune Holdouts At Jersey Shore*, N. Y. TIMES, Sept. 4, 2013 (discussing the Army Corps solution to the damaging effects of Hurricane Sandy in New Jersey).

71. See Parry, *supra* note 10 (discussing delays in beginning construction are the result of hold out homeowners).

72. See *id.* (identifying that nearly half of the homeowners had signed the easements).

building boardwalks.⁷³ Additionally, many people fear the government is taking away their property rights.⁷⁴ When these property owners refused to grant the easements, it often leaves a gap in the protective structure, which negates the structure's ability to defend against severe weather.⁷⁵ As a result, several towns have started eminent domain proceedings against those property owners who refused to willingly sign easements.⁷⁶

To begin an eminent domain proceeding, the government must meet both the public use requirement and the just compensation requirement.⁷⁷ The public use requirement is not an issue in these cases.⁷⁸ The second requirement, just compensation, has presented obstacles for many states, resulting in an increase in litigation.⁷⁹ Because the states are asserting control over private land for a public use, there is no argument this is a taking.⁸⁰ This taking imposes a significant financial burden on the state to provide private property owners with the

73. See *id.* (stating that many homeowners are holding out on signing easements out of fear the government will build boardwalks, parking lots, or public restrooms next to their homes).

74. See *id.* (stating that many reasonable person have developed a fear that the government is trying to take away their property rights).

75. See Zernike, *supra* note 70 (discussing the damage caused to homes because of gaps in the dunes left by neighbors).

76. See MaryAnn Spoto, *Toms River to Start Eminent Domain Proceedings Against 16 Oceanfront Property Owners*, THE STAR LEDGER (last visited Mar. 24, 2015), http://www.nj.com/ocean/index.ssf/2013/10/toms_river_votes_to_start_important_proceedings_against_16_oceanfront_property_owners.html (stating that following similar action taken by Mantoloking, Toms River, New Jersey council has voted to start eminent domain proceedings against 16 oceanfront property owners who have refused to sign easements for a massive federal dune construction project) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

77. See Byrne, *supra* note 6, at 85 (stating that the requirements for a taking under the Fifth Amendment are both public use and just compensation).

78. See 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, 371 (2008) (explaining the primary concern of public trust doctrine is not public use).

79. See *id.* (discussing the impracticability of just compensation in all of these situations).

80. See *id.* (“[T]he state action . . . where the government either takes title to private land or subjects it to the public trust—has been considered an undisputed taking.”).

appropriate compensation.⁸¹ Additionally, because a substantial amount of private land is required to fight against these problems, it may be impracticable for the state to adequately compensate the numerous property owners involved.⁸²

In partial takings cases, the land owner is “entitled to be compensated not only for the value of the land taken but also for any diminution in the value of the remaining land which may be attributable to the taking.”⁸³ The traditional rule when calculating just compensation is that only special benefits can be deducted from compensation or damages in takings cases.⁸⁴ Under the traditional rule, general benefits are not to be considered to reduce the amount of compensation awarded.⁸⁵ General benefits are “those produced by the improvement which a property owner may enjoy in the future in common with all other property owners in the area.”⁸⁶ Special benefits are those that “differ in kind, rather than in degree, from the benefits which are shared by the public at large.”⁸⁷ Special benefits are benefits particular to the property that is the subject of the condemnation and not the type of benefit that was the object of the project.⁸⁸ These benefits are usually incidental benefits and may result from physical changes in the land.⁸⁹

81. See *id.* (discussing the financial difficulties states face when implementing a large scale beach reconstruction project).

82. See *id.* at 371 (explaining the high cost of compensation is impractical in light of the massive nature of these projects).

83. See *Ridgewood v. Sreel Inv. Corp.*, 28 N.J. 121, 125 (1958) (explaining the necessity of including benefits to the homeowner in the calculation of just compensation).

84. See E. H. Schopfloch, Annotation, *Deduction of Benefits in Determining Compensation or Damages in Eminent Domain*, 145 A.L.R. 7 (1943) (distinguishing between general and special benefits in calculating just compensation).

85. See *Borough of Harvey Cedars v. Karan*, 70 A.3d 524, 526 (2013) (“[O]nly special benefits, not general benefits, flowing from a public project can be considered in calculating the enhanced value to the remaining property.”).

86. *Id.* at 532.

87. *Id.*

88. See *id.* at 529 (describing special benefits as ones which directly increase the value of the tract, rather than the neighborhood as a whole).

89. See *id.* (indicating that a special benefit generally isn’t one planned for or accounted for as part of the taking).

Following this traditional compensation rule, the general benefit cannot be used to offset the amount of compensation a homeowner received.⁹⁰

“When one considers the possibility that tens of thousands of square miles of land containing valuable coastal properties and entire cities such as Miami and New Orleans could become submerged, it seems impracticable for the states to protect and extend the public trust if they are required to provide full compensation to all private property owners.”⁹¹

Therefore, some courts have begun to alter this rule to include both general benefits and special benefits in calculating just compensation.⁹² This reduces the amount of compensation a waterfront property owner will receive, making it easier and more affordable for states to implement these projects.⁹³

III. The Borough of Harvey Cedars v. Karan

A. Background

The New Jersey Supreme Court recently held in *Borough of Harvey Cedars v. Karan* that calculation of just compensation for a taking under the Fifth Amendment was required to include the benefit that property owners obtained as a result of storm protection provided by dunes.⁹⁴ The U.S. Army Corps of Engineers and the New Jersey Department of Environmental

90. See *id.* at 526 (“[O]nly special benefits, not general benefits, flowing from a public project can be considered in calculating the enhanced value to the remaining property.”).

91. See Hiatt, *supra* note 78, at 381–82.

92. See *Harvey Cedars*, 70 A.3d at 536–37 (including general benefits as part of the calculation process in certain circumstances).

93. See *id.* at 531 (noting that the jury awarded the Karans \$375,000, which would make projects unfeasible if the state was forced to pay that amount to every homeowner).

94. See *id.* at 541 (holding that calculation of just compensation was required to include benefits that homeowner obtained as a result of storm protection by dunes).

Protection implemented a public project to provide protection to waterfront residents from beach erosion and threatening storms.⁹⁵ One part of the project involves pumping a massive amount of sand onto the beach to extend the shoreline seaward by 200 feet.⁹⁶ A second part of the project involved beach nourishment every seven years over a period of fifty years.⁹⁷ Lastly, the project called for construction of dunes along the entire length of the shore.⁹⁸ The dune construction part of the project required the town to obtain easements on properties bordering the ocean.⁹⁹ The town of Harvey Cedars in New Jersey was able to obtain sixty-six easements by voluntary consent of the oceanfront property owners.¹⁰⁰ Sixteen property owners, however, refused to consent to the construction of the dunes on their property.¹⁰¹

The Karans were one of those sixteen owners of beachfront property in the Borough of Harvey Cedars.¹⁰² The Karans rejected Harvey Cedar's offer of \$300 as compensation for both the land taken and any devaluation of the remaining property.¹⁰³ The Borough of Harvey Cedars exercised its eminent domain authority to take a portion of the Karan property to build a protective dune that connects with other dunes on neighboring waterfront property that runs the entire length of Long Beach

95. *See id.* at 527 (explaining the beach and storm protection project involved, which included beach replenishment and sand dunes).

96. *See id.* (discussing movement of sand back to the shore as part of the beach reconstruction project).

97. *See id.* (explaining how they would continue to replenish the beaches every seven years).

98. *See id.* (discussing the necessity of dune construction as part of the beach reconstruction project).

99. *See id.* (noting that takings are required to follow the process of eminent domain).

100. *See id.* ("The Borough acquired sixty-six easements by voluntary consent of the property owners.").

101. *See id.* (stating that the owners of sixteen beachfront properties did not consent).

102. *See id.* (identifying the Karans as one of the withholding property owners).

103. *See id.* at 528 ("The Karans rejected the Borough's offer of \$300 as compensation for both the land taken and any devaluation of the remaining property.").

Island in Ocean County, New Jersey.¹⁰⁴ All parties agree that the Karans were entitled to “just compensation” for this taking of their property for a public project.¹⁰⁵ The dispute centered on the proper way to calculate this “just compensation” when the taking could lessen and enhance the value of the property as a whole.¹⁰⁶ The essential question: whether the calculation of just compensation should consider only special benefits, or should general benefits be included in the calculation as well.¹⁰⁷

B. Lower Court Decision

The trial court refused to permit Harvey Cedars the opportunity to show that the dune increased the Karans’ property value by protecting it from the damage potentially caused by future storms.¹⁰⁸ The court determined that general benefits were *not* to be included in the “just compensation” calculation.¹⁰⁹ The court reasoned the storm protection benefit was a general benefit because these dunes not only protect all property owners in Harvey Cedars but also add value to all of the included property.¹¹⁰ The Karans were awarded \$375,000 in damages, based primarily on the loss of their oceanfront view.¹¹¹ The

104. *See id.* at 526 (“The Borough of Harvey Cedars exercised its power of eminent domain to take a portion of the beachfront property of Harvey and Phyllis Karan to construct a dune that connects with other dunes running the entire length of Long Beach Island in Ocean County.”).

105. *See id.* (noting that the Karans’ entitlement to “just compensation” for the taking of a portion of their land was never in question).

106. *See id.* (stating that the focus of this case was how to properly calculate “just compensation” when the taking of the Karans’ property both decreased in part and increased in part the value of the remaining land).

107. *See id.* at 534 (stating that the issue before the court was solely an issue of law—“how to compute “just compensation” in a partial takings case”).

108. *See id.* at 526 (“The trial court, however, denied Harvey Cedars the opportunity to show that the dune enhanced the value of the Karans’ property by protecting it from the damage and destruction that is wrought by powerful storms and ocean surges.”).

109. *See id.* (stating that general benefits could not be included in the calculation).

110. *See id.* (classifying the storm protection benefit as a general benefit as it helped the community at large).

111. *See id.* (“The jury awarded the Karans \$375,000 in damages, premised mostly on the loss of their oceanfront view.”).

Appellate Division affirmed, agreeing with the trial courts conclusion that the protection afforded to the Karans' property by the dune construction was a general benefit.¹¹² The Appellate Court concluded that "while defendant's property may be benefited in somewhat 'greater . . . degree' than its inland neighbors, because it is closer to the ocean and therefore in somewhat greater danger of incurring storm damage, that is not a legally cognizable 'special benefit' for purposes of valuation in a condemnation case."¹¹³

C. New Jersey Supreme Court Decision

The New Jersey Supreme Court reversed, concluding that "when a public project requires the partial taking of property, 'just compensation' to the owner must be based on a consideration of all relevant, reasonably calculable, and non-conjectural factors that either decrease or increase the value of the remaining property."¹¹⁴ The Court reasoned that the calculation used by the Appellate Division, which does not consider a public project's general benefits, led to a compensation award that did not reflect the owner's true loss.¹¹⁵ The Court acknowledged that the benefits of the dune project extended beyond the Karans to their neighbors further from the shoreline.¹¹⁶ The Court argued, however, that it was clear the properties "most vulnerable to dramatic ocean surges and larger storms are frontline properties, such as the Karans."¹¹⁷ Therefore, the Court concluded that the Karans benefited to a greater degree than their westward neighbors.¹¹⁸ The Court stated that "reasonably calculated benefits—regardless of whether those benefits are enjoyed to

112. See *Borough of Harvey Cedars v. Karan*, 40 A.3d 75, 82 (N.J. App. Div. 2012), *overruled by* *Borough of Harvey Cedars v. Karan*, 70 A.3d 524 (2013) (affirming trial court's decision that benefit was a general benefit).

113. *Id.*

114. *Harvey Cedars*, 70 A.3d at 526–27.

115. See *id.* at 527 (noting that the lower court essentially pretended the benefits did not exist).

116. See *id.* at 541 ("Unquestionably, the benefits of the dune project extended not only to the Karans but also to their neighbors further from the shoreline.").

117. *Id.*

118. See *id.* ("Therefore, the Karans benefitted to a greater degree than their westward neighbors.").

some lesser or greater degree by others in the community—that increase the value of property at the time of the taking should be discounted from the condemnation award.”¹¹⁹ The Court held that calculation of just compensation was required to include benefit that homeowners obtained as a result of storm protection provided by dunes.¹²⁰

D. Aftermath of Harvey Cedars v. Karan

This decision breaks from the long-standing common law distinction between general benefits and special benefits.¹²¹ The traditional rule holds that in the ordinary condemnation case, compensation is based on the value of the property at the time of the taking, disregarding depreciation or inflation attributable to the proposed improvement—the special benefits.¹²² Thus, the New Jersey Supreme Court decided that, despite the damage caused to the Karans’ property, the protective benefit that the Karans received should be considered in calculating “just compensation,” thus reducing the amount they would originally have received.¹²³ With this new formula for calculating just compensation, the Karans settled for merely \$1, as opposed to the \$375,000 they were initially awarded.¹²⁴

The New Jersey Supreme Court emphasized that without the dune project the Karans property had only a 27% chance of

119. *Id.* at 543.

120. *See id.* at 526 (holding that such benefits both uniquely and generally benefit the property).

121. *See id.* at 533 (discussing calculation methods of just compensation).

122. *See* Borough of Harvey Cedars v. Karan, 40 A.3d 75, 81 (N.J. Super. Ct. App. Div. 2012) (“The applicable rule in the ordinary condemnation case is that the proper basis of compensation is the value of the property as it would be at the time of the taking disregarding depreciation or inflation attributable to the proposed improvement.”).

123. *Harvey Cedars*, 70 A.3d at 533 (discussing the inclusion of protective benefit in calculation).

124. *See* MaryAnn Spoto, *Harvey Cedars Couple Receives \$1 Settlement for Dune Blocking Ocean View*, THE STAR LEDGER (last visited Mar. 24, 2014), http://www.nj.com/ocean/index.ssf/2013/09/harvey_cedars_sand_dune_dispute_settled.html (discussing the Karans settlement deal) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

surviving fifty years without any storm damage.¹²⁵ The court stated “just compensation does not entitle a landowner to a windfall from a partial taking of property.”¹²⁶ Therefore, in the eyes of the New Jersey Supreme Court, the fact that the dune would greatly protect the property increased the value and should be considered in calculating the compensation.¹²⁷

The Karans were no longer entitled to the original award of \$375,000.¹²⁸ This decision is likely to decrease the amount of compensation of similarly situated homeowners when their properties are needed for beach replenishment or armoring projects.¹²⁹ If the court had sided with the Karans, the result would likely be that these projects would be too expensive to implement.¹³⁰ This case deals with “soft” armoring because it involves a beach replenishment project of building dunes.¹³¹ Although the effects of soft armoring are less detrimental on the environment than hard armoring, such projects still pose environmental risks to the shoreline ecosystem.¹³² Therefore, the *Harvey Cedars* decision resulted in a loss of compensation to the Karans from \$375,000 to \$1.¹³³ This minimal compensation award makes it much easier for the town to build the dunes, but ignores the environmental impact.¹³⁴ If the outcome had been in

125. See *Harvey Cedars*, 70 A.3d at 529 (“Without the dune project, the Karans’ property had only a 27% chance of surviving fifty years without any storm damage.”).

126. *Id.* at 541.

127. See *id.* at 533 (discussing the Court’s calculations).

128. See Samuelson, *supra* note 16 (discussing the Court’s rejection of the jury award).

129. See *id.* (“The decision will likely decrease the amount of compensation awarded to homeowners for use of their land for beach replenishment projects in the future, to the relief of shore municipalities considering the use of eminent domain against homeowners who are reluctant to allow dune construction on their property.”).

130. See *id.* (“If the court had sided with the Karans, many proponents of dune construction worried that projects would become prohibitively expensive.”).

131. See Byrne, *supra* note 6, at 93 (defining soft armoring).

132. See *id.* (discussing the negative effects of soft armoring as compared with hard armoring).

133. See *Borough of Harvey Cedars v. Karan*, 70 A.3d 524, 531–32 (reducing calculation of trial court award from \$375,000 to \$1).

134. See Samuelson, *supra* note 16 (discussing the benefit to towns of reduced jury award).

favor of the Karans, it is likely several towns, like Harvey Cedars, would be unable to afford these reconstruction projects and it would be inevitable that the town and oceanfront property would suffer severe physical and financial damage.¹³⁵

IV. Why Harvey Cedars Should Not Be Universally Applied

The *Harvey Cedars* decision raised the question of “who should pay” in beach reconstruction cases: the town or the individual. The New Jersey Supreme Court answer to that question resulted in a shift in property law that required beachfront property owners to bear a substantial cost of protecting the whole beach, while at the same time making it much easier for state to implement their desired protection methods.¹³⁶ The New Jersey Supreme Court failed to address the issue that by altering traditional common law property rights, such as the amount received for just compensation, it is now easier for states to implement protective projects that have increasingly been found to cause environmental damage.¹³⁷ Thus, the reduction in property rights comes at a greater cost than originally thought. This decision fails to take into consideration other factors, focusing instead on finding a “quick fix” to the problem of rising sea levels and beach erosion.¹³⁸ The public has developed an unrealistic expectation that beaches will always remain where they are and in the condition they are currently in and in efforts to maintain their beaches, society has often overlooked the damage that is actually being caused by structures that are supposed to be protective.¹³⁹

A. Environmental Concerns

135. See *id.* (explaining the prohibitive cost of upholding the jury award).

136. See *Harvey Cedars*, 70 A.3d at 527 (discussing holding that shifts the financial burden to homeowners).

137. See Cardiff, *supra* note 59, at 271–72 (summarizing case law that allowed for state construction of protective projects).

138. See *id.* at 256–57 (explaining the environmental impacts generally not considered when implementing beach projects).

139. See *id.* at 277 (discussing how, furthermore, the public may not even realize that degradation is occurring).

In the United States, sea walls and other forms of armoring have been a popular response to the problems brought on by climate change.¹⁴⁰ If the compensation calculation employed in the *Harvey Cedars* decision is adopted nationally, states will quickly move forward with beach protection projects because they will be able to implement these projects at a much lower cost.¹⁴¹ The problem then presented is that “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.”¹⁴² It has been said that: “seawalls damage virtually every beach they are built on. If they are built on eroding beaches—and they are rarely built anywhere else—they eventually destroy the beach.”¹⁴³

1. Beach Erosion

Shoreline armoring has the potential to permanently alter the dynamic of the coastline.¹⁴⁴ This erosion control method has been found to have numerous unintended and destructive environmental effects.¹⁴⁵ In fact, sea walls do nothing to limit beach erosion, and instead actually *increase* the rate at which beaches erode.¹⁴⁶ Construction of sea walls, or other armoring methods, results in the loss of beaches between the seawall and the shoreline.¹⁴⁷ Specifically, “[h]ard armoring will eliminate the intertidal area as seas rise, and it often increases erosion of neighboring properties by increasing current and wave action

140. See Black, *supra* note 4, at 375 (stating that the United States has historically responded to coastal erosion problems by building sea walls).

141. See *Harvey Cedars*, 70 A.3d at 527 (explaining a compensation calculation where the homeowner bears the financial burden).

142. Pace, *supra* note 44, at 328.

143. Cardiff, *supra* note 59, at 255.

144. See Pace, *supra* note 44, at 338 (“This popular erosion control tool, however, is forever altering the dynamic of the nation’s coastline.”).

145. See *id.* at 338 (discussing the unintended environmental impact shoreline armoring has on beaches).

146. See *id.* at 375 (“Although sea walls may be effective at protecting the building directly behind them, they do nothing to limit beach erosion and are generally understood to actually *increase* the rate of erosion.”).

147. See Pace, *supra* note 44, at 337 (“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.”).

laterally against unprotected shoreline.”¹⁴⁸ Soft armoring has been found to cause less significant environmental damage, but it may not be able to preserve ecological functions performed by natural shorelines.¹⁴⁹ In a sense, shoreline armoring only truly benefits a small minority of property owners, while it decreases access to the millions of people wishing to use the beach recreationally.¹⁵⁰

Shoreline armoring causes both passive erosion and active erosion.¹⁵¹ Passive erosion is the narrowing of the part of the beach located in front of the seawall due to the fact that the seawall fixes in place at the back end of the beach, preventing the retreat of the shoreline, while the lower portion of the beach continues to erode.¹⁵² Active erosion, on the other hand, is “sand loss caused by waves rebounding off of the seawalls themselves and scouring away the sand.”¹⁵³ Therefore, in attempts to protect the oceanfront property, towns are actually further harming the beach by increasing erosion.

2. Loss of Habitats

Even without considering the damage done to animal habitats by building some of these protective structures, endangered species are already at risk due to rising sea levels.¹⁵⁴

148. Byrne, *supra* note 6, at 87.

149. See *id.* at 87 (comparing the environmental impacts of both hard and soft armoring).

150. See Cardiff, *supra* note 59, at 256 (“Shoreline armoring only benefits the incredibly small minority of the population that owns property directly on the coast, while it decreases access to the millions of people who flock to the beach every year.”).

151. See Cardiff, *supra* note 59, at 258 (discussing the main ways in which shoreline armoring destroys beaches, namely occupation loss, active erosion, and passive erosion).

152. See *id.* at 258 (defining passive erosion).

153. *Id.*

154. See Center for Biological Diversity, *Deadly Waters; How Rising Seas Threaten 23 Endangered Species* (Dec. 2013), available at http://www.biologicaldiversity.org/campaigns/sea-level_rise/pdfs/SeaLevelRiseReport_2013_print.pdf (discussing the threat rising sea levels bring to endangered species) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

As beaches disappear, so do the habitats located on them.¹⁵⁵ The United States is home to 1,383 threatened and endangered species, a disproportionate number of which rely on coastal habitats.¹⁵⁶ As sea levels rise, seventeen percent of the nation's endangered animals will face increasing environmental pressures.¹⁵⁷ Rising sea levels will harm these species by submerging and eroding their habitats.¹⁵⁸ Additionally, groundwater habitats will be contaminated by saltwater intrusion, resulting in the die-off and conversion of plant communities.¹⁵⁹

The traditional approach of armoring the shoreline causes a serious loss of those habitats and ecosystems as well.¹⁶⁰ For example, certain beach restoration projects replace eroded sands with new sand that differs in the nature and quality.¹⁶¹ This "new" sand deprives animals of critical qualities they relied on in the natural sand.¹⁶² It has also been discovered that sea turtles are capable of adapting to the natural erosion of beaches and effects of devastating coastal storms, but have a much harder time acclimating to human-caused changes in the beach sand.¹⁶³ The continued use of armoring will result in the loss of numerous

155. See Caldwell, *supra* note 57, at 540 ("As the beaches vanish, so does habitat for wildlife . . .").

156. See Center for Biological Diversity, *supra* note 154 (discussing how endangered species are affected by changes to the coastline).

157. See *id.* (discussing the effect of sea-level rise in the United States on threatened and endangered species).

158. See *id.* (noting the deleterious effect of rising sea-levels on certain endangered species).

159. See *id.* (identifying some of the damage that will be done to animal habitats by rising sea levels).

160. See Pace, *supra* note 44, at 329 ("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.").

161. See Craig Anthony Arnold, *Legal Castles in the Sand: The Evolution of Property Law, Culture, and Ecology in Coastal Lands*, 61 SYRACUSE L. REV. 999, 1018 (2010) (discussing some of the problems associated with some beach restoration projects).

162. See Arnold, *supra* note 161, at 1018 (discussing the impact on sea turtle habitats).

163. See *id.* ("While sea turtles naturally adapted to the natural erosion of beaches, effects of hurricanes and storms on beaches, and landward migration of coastlines, they have a much harder time adapting to human-caused alterations of beaches . . .").

near-shore species, as well as diminish diversity among those that remain.¹⁶⁴

3. *Expensive and Temporary*

Armoring is extremely costly.¹⁶⁵ It is economically unfeasible to protect entire coasts through armoring.¹⁶⁶ Often, the costs of maintaining the sea wall over time are considerably more than the value of the property the sea wall is attempting to protect.¹⁶⁷ An important factor to consider when evaluating these projects is the fact that these protective measures are temporary.¹⁶⁸ In fact, the increase in the beach width may only last one season.¹⁶⁹ In essence, shoreline armoring “fixes” the back of the beach, which then stops natural shoreline erosion.¹⁷⁰ Thus, the beach is unable to migrate inwards as the sea level rises.¹⁷¹ The destructive impact of this process is that the sea level continues to rise, covering the existing beach, and the process prevents new beaches from being created.¹⁷²

V. *More Equitable Solution: Multi-Factor Balancing Test*

If courts continue to follow the traditional calculation of just compensation, most beach protection projects will be too

164. See Pace, *supra* note 44, at 339 (“Bulkheads eventually eliminate all intertidal habitat and significantly reduce both the abundance and diversity of many near-shore species.”).

165. See *id.* (discussing the negative effects of armoring).

166. See Byrne, *supra* note 6, at 87 (“Plainly, armoring the entire coast will never be economically feasible or even rational.”).

167. See Black, *supra* note 4, at 375 (discussing the financial costs of shoreline armoring).

168. See Cardiff, *supra* note 59, at 256 (stating that these methods only increase the width of the beach for a very short period of time).

169. See Cardiff, *supra* note 59, at 259 (discussing the temporary benefits of beach replenishment).

170. See Caldwell, *supra* note 57, at 540 (“Armoring fixes the back of the beach, stopping natural shoreline erosion that would otherwise cause beaches to migrate inland as the water rises.”).

171. See *id.* (“Armoring fixes the back of the beach, stopping natural shoreline erosion that would otherwise cause beaches to migrate inland as the water rises.”).

172. See *id.* (discussing the effects of passive erosion on the beaches and shorelines).

expensive to implement and many property owners will suffer extreme damage to their property or lose the beaches altogether.¹⁷³ “The drafters of the Fifth Amendment did not intend to protect private property owners from climate change and its effects.”¹⁷⁴ The climate change and environmental concerns today were unimaginable at the time the Takings Clause was drafted.¹⁷⁵ Simply because the large-scale effects of climate change were not threatening society when the Fifth Amendment was ratified does not mean that the takings clause should not address these new concerns.¹⁷⁶ “[T]he protections provided by the takings clause . . . should be carefully reexamined when technological or societal change recasts the nature of the right, freedom, or liberty that is protected.”¹⁷⁷

When deciding between calculating just compensation the traditional way (i.e. only considering special benefits, thus making beach reconstruction more expensive/impractical for the states) or the *Harvey Cedars* way (i.e. considering both special and general benefits, thus reducing traditional property rights and increasing the long-term harm to the environment, but allowing states to easily implement a much needed protective structure), courts should refrain from adopting one set approach. Instead, courts should apply a multi-factor balancing test.

As shown above, this threat of rising sea levels and disastrous coastal storms creates a dispute between property rights and protection of the environment.¹⁷⁸ In cases such as

173. See Hiatt, *supra* note 78, at 384 (identifying the financial issues associated with government taking of private lands due to rising sea levels and erosion).

174. See Hiatt, *supra* note 78, at 386 (discussing the discrepancy in scientific knowledge between 1791 and present day, and how that difference should affect the interpretation of the drafters’ intent).

175. See *id.* (“It would likely have been inconceivable to the drafters of the takings clause that thousands of square miles of American land and private property would become submerged by the ocean because human activity altered the Earth’s climate and caused sea level rise to then unfathomable levels.”).

176. See *id.* (stating that the takings clause should still provide protection against governmental takings whose causes were unanticipated at the time it was ratified).

177. *Id.*

178. See Hiatt, *supra* note 78, at 386 (discussing the dichotomy between private property interests and broader environmental concerns).

Harvey Cedars, where the courts modify the common law application of just compensation,¹⁷⁹ it becomes easier to implement protective measures, such as armoring, that often cause greater long-term harm to the environment.¹⁸⁰ On the other hand, if the New Jersey Supreme Court had followed the traditional approach in *Harvey Cedars*, holding instead that the protective function of the dune to the Karans' property should *not* be considered in calculating compensation, it becomes significantly more expensive and therefore unfeasible to build these structures. This method, however, avoids any detrimental impact those structures would have on the environment.¹⁸¹ The problems associated with rising sea levels and disastrous storms are predicted to greatly increase over the years¹⁸² and thus, a proper balance must be found between when it is appropriate to reduce traditional property rights at the risk of harming the environment further, and respecting traditional property rights at the risk of not being able to build the protective structures.

It is illogical to conclude that decisions that decrease property rights, as was the case in *Harvey Cedars*, should *never* be adopted simply because of environmental concerns. If this were the case, the government would be left in some instances with few options to help oceanfront properties, exposing property owners to great loss.¹⁸³ One cannot ignore, however, that many of these protections dramatically increase the harm done to our environment.¹⁸⁴ Both factors need to be taken into consideration when deciding if it is appropriate for the government to decrease

179. See *Borough of Harvey Cedars v. Karan*, 70 A.3d 524, 544 (N.J. 2013) (holding that calculation of just compensation was required to include benefit that homeowners obtained as a result of storm protection provided by dune).

180. See Thomas Ruppert, *Reasonable Investment-Backed Expectations: Should Notice of Rising Seas Lead to Falling Expectations For Coastal Property Purchasers?*, 26 J. LAND USE & ENVTL. LAW 239 (discussing the current trend of rising sea levels).

181. See Pace, *supra* note 44, at 338 (discussing the unintended environmental impact shoreline armoring has on beaches).

182. See Caldwell, *supra* note 57, at 329 ("Sea level is rising and the rate of this rise is increasing.").

183. See Pace, *supra* note 44, at 336 (discussing financial impact of deteriorating shoreline on property owners).

184. See *id.* (discussing the negative effects of some coastal projects).

or reduce compensation in a takings case in order to build a potentially environmentally destructive structure to ensure protection to the community and beachfront homeowners.¹⁸⁵ To adequately determine this, courts should adopt a multi-factor balancing test to weight the property concerns with the environment issues. Courts should first look to see if denial of the protective measure could cause a likelihood of imminent threat to the waterfront property. If this is the case, then courts should adopt as a general rule the *Harvey Cedars* holding and include general benefits in the calculation of just compensation. If, however, there is no likelihood of imminent threat, courts should apply a multi-factor balancing test. This would include the following two steps: determining if more environmentally friendly alternatives are available and determining if the costs can be justified.

A. Will denial of this protective measure cause imminent, rapid, or sudden loss of property?

In cases where the property owner will risk imminent, rapid, or sudden loss of their property without the protective structures, the court may be justified in following the *Harvey Cedars* approach to calculating just compensation. Without doing so, the property owner will inevitably lose their property or experience such severe damage that it will be substantially reduced in value.¹⁸⁶ Thus, it makes sense to reduce compensation in cases that require quick state action to protect oceanfront property.

In *Hach v. Zoning Bd. Of Appeals*, the petitioner was an owner of a “beachfront home in East Hampton.”¹⁸⁷ Petitioner, Hach, sought a natural resources special permit from the respondent, the Zoning Board of Appeals of the Town of East Hampton (ZBA), to construct a rock revetment measuring 247 feet in length, 42 feet in width, and 14 feet in height parallel to

185. See *id.* (identifying factors that must be taken into consideration when policymaking).

186. See *Harvey Cedars*, 70 A.3d 524, 526 (2013) (discussing the necessity of government involvement to preserve value of the property).

187. *Hach v. Zoning Bd. of Appeals*, 287 A.D.2d 500, 500 (2001).

the waterline on his land.¹⁸⁸ Hach believed a rock revetment was needed in order to protect his oceanfront property and home from the effects of natural coastal erosion and to generally protect his home from storm surge damage.¹⁸⁹ Prior to requesting permission to build a rock revetment, petitioner had spent approximately \$40,000 on soft armoring solutions that proved to be insufficient to provide relief after they were destroyed by storms.¹⁹⁰ Petitioner, along with experts, believed this permanent rock revetment was essential in protecting his home.¹⁹¹

The ZBA denied Hach's request for a natural resources special permit, expressing concern that if Hach did not maintain this revetment, the beach erosion would only worsen.¹⁹² The ZBA did, however, acknowledge that the revetment would efficiently protect his property.¹⁹³ The Appellate Division found the ZBA's decision was arbitrary and capricious and unsupported by substantial evidence.¹⁹⁴ The Court relied on the East Hampton Town Code § 255-5-50(6), which states that in order to obtain a natural resource permit, the petitioner is required to demonstrate that his property was in imminent danger absent a coastal erosion structure and that the proposed structure is the minimum necessary to control erosion.¹⁹⁵ The Court found that petitioner had clearly demonstrated his property was in imminent danger absent a coastal erosion structure by the fact that the ZBA had approved all his neighboring properties for

188. *See id.* (describing petitioner's revetment).

189. *See id.* (discussing petitioner's reasoning for requesting the natural resources special permit).

190. *See id.* ("The petitioner has expended approximately \$40,000 in years past on so called 'soft solutions,' which consisted of additions of sand alone, but these proved to be insufficient to provide relief as they were washed out by storms.")

191. *See id.* ("The petitioner, with corroborative expert evidence, is thus of the opinion that a revetment, a more permanent 'hard solution' is essential to prevent his home from being destroyed.")

192. *See id.* (discussing the ZBA's reasoning in its decision to deny the permit).

193. *See id.* (discussing the ZBA's decision to deny the permit).

194. *See id.* at 501 ("This determination was arbitrary and capricious and unsupported by substantial evidence.")

195. *See id.* (discussing the East Hampton Town Code requirements for obtaining the permit).

revetments.¹⁹⁶ The court found this signaled recognition of imminent peril.¹⁹⁷ Further, the petitioner had already spent \$40,000 on other protective structures, none of which could adequately protect his property, and all of which had been destroyed by previous storms.¹⁹⁸

While this case involves a situation in which the homeowner was seeking permission to build the structure, it illustrates that in cases where the property is in imminent peril, exceptions must be made to protect the house. A town should be able to reduce compensation to implement beach reconstruction projects when it faces imminent danger of losing all oceanfront property.

In *Allen v. Strough*, Susan Allen, fearing a future hurricane or severe storm would damage or destroy her house, applied for permission to construct a “tapered transitional rock armor revetment.”¹⁹⁹ Allen wished to build a steel bulkhead that was 310 feet by 28 feet that would call for the placement of approximately 6,000 cubic yards of sand over the revetment, and for the planting of beach grass.²⁰⁰ While deciding whether to grant Allen permission to build this structure, the participants in the hearing questioned what, if anything, could be done to save the homes that were at risk and whether the measures necessary to save such homes may be taken only at an unacceptable cost of destroying the beaches further.²⁰¹ Out of fear that Allen’s project would have an adverse impact on the public’s right to pass along

196. See *id.* (stating that the petitioner had clearly met the burden set forth in the East Hampton Town Code §255-5-50(6)).

197. See *id.* (“[T]he ZBA approved revetments for neighboring properties, signaling a clear recognition of imminent peril.”).

198. See *id.* (“Furthermore, the petitioner has already spent \$40,000 on unsuccessful soft solutions and under the circumstances of this cases there is no rational basis for requiring him to spend more money on a proven ineffective solution.”).

199. See *Allen v. Strough*, 301 A.D.2d 11, 13 (2002) (“Fearing that a future hurricane or severe storm could damage or destroy her house, Allen applied to the Board for permission to construct a ‘tapered transitional rock armor revetment.’”).

200. See *id.* at 13 (describing the protective structure Allen wished to construct).

201. See *id.* at 14 (discussing the deliberation process concerning Allen’s proposal).

the beach area, the Board denied her application.²⁰² Allen appealed and the case eventually reached the New York Appellate Division.²⁰³ The Court recognized the ongoing debate over the extent to which these hard structures might increase the rate of erosion and questioned whether the interest by the property owner should yield to the more diffuse interest of the general public in preserving recreational beaches.²⁰⁴ The Court, however, relied on previous cases in which permits such as the one at issue here were authorized for revetments only where denial would make it likely that there would be imminent, rapid, or sudden loss of the property.²⁰⁵ In the previous New York case, *Hach*, the New York Appellate Division concluded that substantial evidence established that the petitioner's property was in imminent danger and thus granted the application.²⁰⁶ The Court differentiates this case from *Hach*, concluding that Allen's property did not face imminent danger and thus was not in need of the "hard" protective structure at the expense of the beach.²⁰⁷

The issue was also considered by the New York Appellate Division in *Poster v. Strough*.²⁰⁸ In this case, the Board denied Poster's application to build a hard protective future, reasoning that this structure would have an adverse impact to both the environment and the rights and resources of the public.²⁰⁹ Poster alleged that since 1998, his property had undergone substantial erosion, that the dune which had stood between the ocean and his house had essentially disappeared, and that the eroded area of the beachfront had come to within "a few feet" of his house, placing it at risk of collapsing.²¹⁰ As in *Allen v. Strough*, the Court

202. See *id.* at 16 (discussing the Board's decision to deny Allen's application).

203. See *id.* at 17 (outlining the procedural posture of the case).

204. See *id.* at 20 (discussing some of the critical policy issues involved in the decision).

205. See *id.* (discussing the holding in *Hach*).

206. See *id.* at 20 (discussing the reasoning behind the court's holding in *Hach*).

207. See *id.* at 20 (identifying the court's differentiation between the circumstances in *Hach* and *Allen*).

208. See *Poster v. Strough*, 299 A.D.2d 127, 128 (2002) (dealing with identical issues seen in *Hach* and *Allen*).

209. See *id.* at 129 (discussing the issues in the case).

210. See *id.* at 130 (illustrating the damage already done to the property by rising sea level and storms).

held that Poster failed to submit any evidence that damage to his house was imminent, or that alternative methods of avoiding any such potential damage, such as moving the house, were unfeasible.²¹¹ He was not permitted to build the structure for lack of the possibility of imminent, sudden, or rapid harm.²¹²

These three cases illustrate that when the property is not in imminent danger, the court should respect the traditional property rights. In these cases, the court should not follow the *Harvey Cedars* court in including general and specific benefits in compensation calculations. It is true that other factors may play into using this form of calculation. When there is no imminent risk of losing property, however, the court should require other factors before abandoning the traditional calculation method.

B. The Multi-Factor Balancing Test

1. Are There Other More Environmentally Friendly Alternatives That Can Easily Be Implemented?

While traditional beach protective structures may seem to be the most effective and efficient way to protect property, there are other options that cause substantially less environmental damage and may require fewer invasions into one's property rights. Retreat, dewatering, living shorelines, and re-vegetating present viable alternatives to sea walls and other harmful structures.

A. Retreat

Retreat is a protection method used to avoid natural hazards by withdrawing from the shoreline.²¹³ It requires relocation of infrastructure further inland when it is positioned in hazardous

211. See *id.* at 143 (discussing the court's reasoning in denying Poster's request).

212. See *id.* at 143 (discussing the court's final ruling).

213. See Martin Randall, *Coastal Development Run Amuck: A Policy of Retreat May Be The Only Hope*, 18 J. ENVTL. L. & LITIG. 145, 168 (2004) ("Retreat is the avoidance of natural hazards through the withdrawal from the shoreline in lieu of protection.").

areas of the coast.²¹⁴ The absence of building and developing on the shoreline would greatly reduce the harm suffered to property as a result of coastal storms.²¹⁵ By preventing development in areas with high risk of coastal damage, retreat will reduce public costs of defending and responding to this crisis, in addition to permitting natural landscape features by providing “valuable ecological services to migrate landward.”²¹⁶ The most effective way to implement a retreat method is to combine direct regulation with financial incentives.²¹⁷ For example, property owners could be mandated to move inland and given tax incentives for relocation to lower risk areas.²¹⁸ This solution avoids the problems associated with a single course of action such as using eminent domain to condemn property.²¹⁹

Retreat can be extremely expensive.²²⁰ The government has three options with regard to effectuating retreat: (1) purchase undeveloped coastal land; (2) forbid development of privately owned land; or (3) prohibit the reconstruction of structures destroyed by storms or erosion.²²¹ Any of these three actions can cost a state an extensive amount of money in either acquisition or legal fees.²²² Therefore, when considering if a retreat is the most viable method, governments should compare the costs of protecting the buildings and property on the shoreline to the costs of the actual retreat, such as the costs associated with relocating structures and acquiring property. In cases where factors exist such as: investment in structures is low, relatively inexpensive

214. See Pace, *supra* note 44, at 334 (“A retreat approach to sea level rise necessitates relocation of costly infrastructure further inland . . .”).

215. See Randall, *supra* note 213, at 168 (discussing the benefits and disadvantages of retreat).

216. Byrne, *supra* note 6, at 96.

217. See Black, *supra* note 4, at 376 (pontificating on the merits of retreat).

218. See *id.* (discussing the most successful examples of mandated retreat).

219. See *id.* (discussing the methods used in successful mandated retreat).

220. See Randall, *supra* note 215, at 168 (discussing the benefits and disadvantages of retreat).

221. See *id.* (stating the three actions a government must take to implement a retreat method).

222. See *id.* (further discussing actions a government must take to implement a retreat method).

land is available nearby, regulations explicitly prevent erosion control structures and favor or require relocation, there is a low density of development, retreat may be an acceptable and effective option.²²³ Overall, the environmental and economic arguments for retreat in areas of rising sea level and areas prone to coastal storms are compelling, at least in areas not intensely developed.²²⁴ Unfortunately, retreat is often seen as the more feasible option *after* a disaster actually occurs.²²⁵

B. Dewatering Projects

Dewatering systems present a cost-effective, environmentally friendly, and sustainable solution to beach erosion.²²⁶ Dewatering projects are said to be a reliable solution to insufficient beach drainage.²²⁷ When the tide comes in, the beach fills with water, and as the tide goes out, the beach drains.²²⁸ A beach typically drains slower than the receding tide, which results in a saturated beach during a falling tide, which is more prone to erosion.²²⁹ Over time, better draining can result in reduced erosion and better deposition of sand.²³⁰ Gradually, the beach will grow wider, higher, and provide better protection against coastal storms.²³¹ Dewatering projects are designed to increase a beach's ability to drain, allowing beaches to drain

223. See *id.* at 215, at 169 (discussing the viability of retreat and circumstances under which it is most reasonable).

224. See Byrne, *supra* note 6, at 96 (“The environmental and economic arguments for retreat before sea-level rise are compelling, at least for many coastal areas not intensely developed.”).

225. See Black, *supra* note 4, at 376 (“Unfortunately, mandated retreat becomes more politically feasible in the wake of a disaster.”).

226. See BMT Designers and Planners, Inc., *Coastal Erosion Mitigation*, BMT DESIGNERS & PLANNERS, available at <http://www.dandp.com/media/4583393/BMT%20D&P%20Coastal%20Erosion%20Mitigation.pdf> (describing dewater as an alternative) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

227. See *id.* (“[D]esigned to enhance a beach’s ability to drain and can be used on natural beaches and in conjunction with beach replenishment projects. The passive dewatering system is not detectable by the beach visitor and does not adversely affect habitat critical to coastal wildlife . . .”).

228. See *id.* (describing how dewatering projects operate).

229. See *id.* (describing the dewatering process).

230. See *id.* (discussing the results of better draining).

231. See *id.* (describing how dewatering projects operate).

more rapidly than those without the system.²³² The system works by removing excess water.²³³ This system would not be noticeable to the public and it does not have a negative impact on coastal wildlife's habitats.²³⁴

B. Living Shorelines

Shoreline armoring does little to protect coastal areas in the long-run, and instead have immense destructive impacts on coastal areas.²³⁵ An emerging approach to protect shorelines is the use of "living shorelines."²³⁶ This approach is seen as a more "natural" defense approach when compared with traditional techniques.²³⁷ Living shorelines have been described as "a suit 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."²³⁸

Living shorelines use plants, sand, and rocks to provide shoreline protection, at the same time maintaining coastal wildlife habitats.²³⁹ "Living shoreline projects utilize a variety of structural and organic materials, such as wetland plants, submerged aquatic vegetation, oyster reefs, coir fiber logs, sand fill, and stone."²⁴⁰ Living shorelines provide a more practical approach to dealing with erosion by controlling erosion, maintaining natural coastal processes, and sustaining

232. See *id.* (describing the benefits of dewatering projects).

233. See *id.* (describing how dewatering projects operate).

234. See *id.* (describing how dewatering projects operate).

235. See Pace, *supra* note 44, at 340 ("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.").

236. *Id.*

237. National Oceanic and Atmospheric Administration, *Living Shorelines*, NOAA HABITAT CONSERVATION, <http://www.habitat.noaa.gov/restoration/techniques/livingshorelines.html> [hereinafter *NOAA*] (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

238. See Pace, *supra* note 44, at 340 (explaining the theory behind living shorelines.).

239. See NOAA, *supra* note 241 (discussing how to implement the living shoreline methods).

240. *Id.*

biodiversity.²⁴¹ Another beneficial aspect of living shorelines is the fact that this method is usually more economical than hard armoring and requires less maintenance in the long-run.²⁴²

D. Re-Vegetation

Re-vegetation is a lost-cost, simple shoreline protection method that can be implemented by the landowner.²⁴³ It is important to note that it can only be used in cases of lawns or bare shorelines with low to moderate erosion.²⁴⁴ Re-vegetation involves re-planting native vegetation that naturally stabilizes the shoreline.²⁴⁵ The plant's deep roots help protect the shoreline from erosion by tightly binding the earth below.²⁴⁶

2. Can the Costs be Justified?

There are certain situations that require courts to reduce the amount of compensation awarded in beach reconstruction takings cases because the damage that would be caused otherwise outweighs any concerns over reduced compensation. The two main situations in which this may be the case are in urban settings and areas that rely on tourism for their main source of income.

A. Urban Areas

241. See Pace, *supra* note 44, at 340 (discussing the benefits of living shorelines over hard armoring).

242. See *id.* (“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.”).

243. See Department of Environmental Conservation, *Shoreline Stabilization Techniques* (July 2010), available at http://www.dec.ny.gov/docs/permits_ej_operations_pdf/stabiltechguid.pdf (introducing “softer” shoreline protection methods) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

244. See *id.* (“Re-vegetation works in the case of lawns or bare shorelines with low to moderate erosion.”).

245. See *id.* (describing re-vegetation methodology).

246. See *id.* (“The deep roots of these plants bind the earth below tightly, effectively protecting your shoreline from erosion.”).

Two-thirds of the world's cities that have populations over five million are located in areas that have been deemed to be "high risk" areas for flooding.²⁴⁷ In certain urban settings, sea walls are the best erosion control device.²⁴⁸ Often, there are minimal protective options cities can implement due to the specific characteristics of a city, attributable to existing shoreline development, or in densely populated cities such as New York, to the value of the property being protected.²⁴⁹ The value of this property often outweighs the cost of constructing and maintaining the seawall, thus making it the better economical choice.²⁵⁰ Retreating is not a reasonable option in big cities.²⁵¹ It is impractical for a large city to stop development or buy up all the property in danger of flooding.²⁵² Additionally, many large cities anticipate continuous growth over the next few decades making it impossible to stop development.²⁵³ For example, New York anticipates another million residents over the next two decades.²⁵⁴ As Rafael Pelli, a Manhattan architect who serves on a climate-change committee that advises the New York Department of City Planning, stated, "If you have to relocate

247. See *Consequences of Climate Change on the Oceans*, CLIMATE INSTITUTE, <http://www.climate.org/topics/sea-level/index.html> ("[T]wo-thirds of the world's cities that have populations over five million are located in these at-risk areas.") (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

248. See Black, *supra* note 4, at 375 (discussing sea walls as potentially the only alternative in urban areas).

249. See *id.* ("The lack of feasible options may be attributed to existing shoreline development or, in densely populated cities such as London or New York, to the value of protected property outweighing the costs of constructing and maintaining a sea wall.")

250. See *id.* (discussing the comparative viability of sea walls in urban areas).

251. See Mireya Navarro, *New York is Lagging as Seas and Risks Rise, Critics Warn*, N.Y. TIMES, Sept. 10, 2012, available at <http://www.nytimes.com/2012/09/11/nyregion/new-york-faces-rising-seas-and-slow-city-action.html?pagewanted=all&r=0> (explaining why big cities cannot use retreat as a method for dealing with climate change) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

252. See *id.* ("Curbing development or buying up property in flood plains . . . is too impractical here.")

253. See *id.* (discussing the growth of big cities).

254. See *id.* ("[T]he city anticipates another million residents over the next two decades.")

10,000 people, how do you do that?"²⁵⁵ Additionally, in cities, such as Manhattan, there is no beach therefore the environmental concern is not present and economic concerns can take priority.²⁵⁶

It is extremely expensive for cities to construct sea walls.²⁵⁷ If cities are forced to compensate homeowners the traditional way, several cities simply will not be able to afford providing this protection. For example, New York City plans on spending over \$2 billion on these projects in the next eighteen years.²⁵⁸ In fact, it has been estimated that installing barriers for New York will cost \$10 billion.²⁵⁹ If the city does not find a way to make constructing these sea walls less expensive, the city will be billions of dollars short of armoring itself.²⁶⁰ Another example of a city in trouble is Boston. Over the next century, damage in Boston could exceed \$20 billion, depending on the city's response to rising sea levels.²⁶¹

Cities unable to build these protective structures could face financial devastation beyond what is expected in smaller towns.²⁶² For example, potential flooding in New York could paralyze transportation, cripple the low-lying financial district, and temporarily drive hundreds of thousands of people from their home.²⁶³ Additionally, residents of cities with large industrial waterfronts with chemical-manufacturing plants, oil-storage sites, or garbage-transfer stations face serious safety

255. *Id.*

256. *See id.* (explaining that the lack of beaches reduces erosion concern).

257. *See id.* (discussing the costs of building sea walls in cities).

258. *See id.* ("Overall, the city is hoping to funnel more than \$2 billion of public and private money to such environmental projects over the next 18 years . . .").

259. *See id.* (discussing what the cost would be to protect New York City from climate change).

260. *See id.* (discussing the consequences of not altering sea wall construction methods).

261. *See* Craig LeMoult, *Tufts Civil Engineer Predicts Boston's Rising Sea Levels Could Cause Billions Of Dollars In Damage* (Feb. 16, 2013), available at http://www.eurekalert.org/pub_releases/2003-02/tu-tce021403.php (discussing the effects of climate change on Boston) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

262. *See* Navarro, *supra* note 251 (discussing the financial impact of climate change on New York City).

263. *See id.* (elaborating on climate change and the economy).

risks if the city is not protected from storm.²⁶⁴ Sea walls are required in these areas to prevent contamination from the hazardous materials.²⁶⁵

It is impossible to fully insulate a city from environmental harms, but implementing a more costly method of building sea walls, and reducing the amount homeowners receive for just compensation, will provide cities with a chance to protect its residents and property.

B. Tourism

In certain areas, beaches are vital to the state's economy.²⁶⁶ Eighty-five percent of all United States tourism revenues occur in coastal states.²⁶⁷ If those states are unable to afford building beach protective structures, the state could face losing a substantial amount of money.²⁶⁸ Tourism infrastructure will be heavily damaged, resulting in local economic depressions for communities that depend heavily on the industry.²⁶⁹ For example, California generates fourteen billion tourism dollars per year.²⁷⁰ From an economic viewpoint, California's beaches are considerable more important to the overall economy than the property being protected.²⁷¹ If California is unable to afford beach protection due to the high landowner compensation costs, the state will lose a substantial portion of its tourism industry and

264. *See id.* (stating the environmental concerns for areas like the South Bronx which have large industrial waterfronts).

265. *See id.* (concluding that sea walls are required on large industrial waterfronts).

266. *See* Arnold, *supra* note 161, at 1018 ("Coastal areas are highly popular places to live and visit. Over half of the U.S. population lives in coastal areas, even though coastal areas constitute only seventeen percent of the total area in the contiguous forty-eight states.").

267. *See id.* at 1019 ("[E]ighty-five percent of all U.S. tourism revenues occur in coastal states.").

268. *See id.* at 1019–20 (listing the cultural impact these tourist areas have and how reliant they are on tourism).

269. *See* Byrne, *supra* note 6, at 79 ("Tourism infrastructure will also be heavily damaged, resulting in local economic depressions for communities that depend heavily on the industry.").

270. *See* Cardiff, *supra* note 59, at 256 (discussing the impact on California).

271. *See id.* (discussing the impact on California).

associated revenue.²⁷² The Pacific Ocean is estimated to rise 55 inches by 2100, causing Venice Beach to lose up to and estimated \$440 million in tourism and tax revenue.²⁷³ It is expected Zuma Beach and Broad Beach in Malibu will experience a drop in visitors, costing Malibu nearly \$500 million in revenue.²⁷⁴

Certain states have adopted legislation addressing this issue. South Carolina's legislature found that the dune system along its coast was "extremely important" to the state as "a storm barrier" contributing to "shoreline stability," by "generating approximately two-thirds of the state's annual tourism industry revenue."²⁷⁵ Furthermore, "Florida adopted the Beach and Shore Preservation Act . . . in 1961."²⁷⁶ This Act declared beach erosion "a serious menace to the economy and general welfare of the people." Florida's legislative response to widespread beach erosion was to pronounce it a "necessary governmental responsibility to properly manage and protect Florida beaches" and to "make provision for beach restoration and nourishment projects."²⁷⁷ Florida declared that the funding of the state's beach management plan is justified by the legislative finding that erosion of the beaches is detrimental to tourism.²⁷⁸

It is important to note here that in the context of armoring cities, soft armoring should be used over hard armoring.²⁷⁹ Long-

272. See *id.* at 281 ("It is impossible to ignore the fact that 150 miles of seawalls is, at the very least, having a disastrous cumulative impact on . . . recreational beach. Yet, the emotional appeals of homeowners are also impossible to ignore. Ultimately, compromise is not possible.").

273. See Tony Barboza, *Rising Sea Levels Could Take Financial Toll on California Beaches*, LOS ANGELES TIMES (Sept. 13, 2011), available at <http://latimesblogs.latimes.com/greenspace/2011/09/rising-sea-levels-could-take-financial-toll-on-california-beaches.html> ("Venice Beach could lose up to \$440 million in tourism and tax revenue if the Pacific Ocean rises 55 inches by 2100 as scientists predict, according the study commissioned by the California Department of Boating and Waterways.") (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

274. See *id.* ("A drop in visitors to an eroded Zuma Beach and Broad Beach in Malibu would cost nearly \$500 million in revenue . . .").

275. Caldwell, *supra* note 57, at 573.

276. Nolon, *supra* note 40, at 744.

277. *Id.* at 744–45.

278. See *id.* at 744–45 (elaborating on Florida's legislative response).

279. See Byrne, *supra* note 6, at 87 (stating that soft armoring is better environmentally for the beaches).

term effects of hard armoring consist of loss of the sandy beach between the seawall and the water's edge.²⁸⁰ Soft armoring causes less environmental damage to the beach because it mimics natural shorelines.²⁸¹ In order to preserve the beach in its most natural form, states should use soft armoring techniques such as dune replenishment.²⁸²

C. Applying the Multi-Factor Balancing Test to Harvey Cedars

It is not disputed that without the dune-construction project, the Karans and other shoreline homeowners could experience substantial damage to their property if a storm occurred in the future.²⁸³ The Borough of Harvey Cedars presented expert testimony from Randall A. Wise of the Army Corps of Engineers, a civil engineer specializing in coastal engineering.²⁸⁴ Wise stated that over a thirty-year period, without the dune-construction project there was a 56% chance a storm could completely damage the Karans' shoreline home.²⁸⁵ The expert testimony focused on the long-term damage, concluding that the Karans would likely suffer damage within *thirty* years.²⁸⁶ It is questionable whether it was necessary to drastically reduce compensation awarded to the Karans because no testimony was provided that the dune was needed immediately or that Harvey Cedars would be unable to build the dune if the Court followed the traditional approach to calculating just compensation.²⁸⁷ Rather, Harvey Karan testified that his home was built in 1973

280. See Pace, *supra* note 44, at 337 (discussing the negative implications of utilizing hard armoring).

281. See Byrne, *supra* note 6, at 87 ("Soft armoring causes less environmental harm because it mimics natural shorelines . . .").

282. See *id.* (discussing soft armoring techniques).

283. See Borough of Harvey Cedars v. Karan, 70 A.3d 524, 529 (discussing the expert testimony concerning the damage that would result to shoreline properties without a dune-construction project).

284. See *id.* (introducing Wise as an expert).

285. See *id.* (discussing the findings of the expert testimony).

286. See *id.* ("[T]he court concluded that the financial benefits of the beach-replenishment and storm-protection project were shared . . . by the larger community of Harvey Cedars and therefore were general benefits.").

287. See *id.* ("Without the dune project, the Karans' property had only a 27% chance of surviving fifty years without any storm damage.").

and since that time he had not a “lick of water” invade the living quarters of his home.²⁸⁸

Without the likelihood of an imminent threat to the property, the Court should have applied the multi-factor balancing test. The first step would require the New Jersey Supreme Court to determine if more environmentally friendly alternatives existed. There was no mention in the lower court or in the New Jersey Supreme Court concerning the environmental damages that are associated with the dune-construction project.²⁸⁹ Therefore, it appears that the Court overlooked the fact that the town of Harvey Cedars may have ignored other possible alternatives. If more environmental friendly alternatives exist, a court should be reluctant to alter the traditional property rights of a homeowner to allow a town to implement a project that will provide immediate relief, but long-term damage.

The Court should have also considered whether the damage that would be caused without the dune-construction project outweigh the costs of implementing the project. Harvey Cedars is a small, primarily residential, town located along the New Jersey shore with a minimal population.²⁹⁰ Most visitors of Harvey Cedars come to relax in their summer homes.²⁹¹ In fact, there are no hotels in the town for tourists to stay.²⁹² The problems mentioned above associated with urban areas and areas that rely on tourism do not apply to Harvey Cedars. This is not to say that the dunes should not be built – there is still a need to protect the shoreline property in Harvey Cedars. Rather, the state interest in protecting this shoreline is less compared to those of urban and tourism areas. Therefore, if the state is to proceed with the dune-construction project, it should follow the traditional calculation of just compensation that has always been used in the past. A town should be required to show additional

288. See *id.* at 530–31 (discussing Harvey Karan’s testimony).

289. See *id.* at 529–34 (showing there has not been a discussion concerning potential environmentally negative effects from dune construction).

290. See *Harvey Cedars, New Jersey*, LONG BEACH ISLAND JOURNAL (last visited Mar. 29, 2015), <http://www.longbeachislandjournal.com/communities/harvey-cedars> (describing the area discussed in *Karans*) (on file with the WASHINGTON AND LEE JOURNAL OF ENERGY CLIMATE AND THE ENVIRONMENT).

291. See *id.* (discussing local tourism).

292. See *id.* (explaining consumer infrastructure).

reasons for reducing a homeowner's property rights, aside from the fact that the project is expensive if the town is to follow the traditional just compensation calculation method.

IV. Conclusion

It has become clear that due to increasing sea levels and more frequent coastal storms, the government may not have any option but to compromise certain traditional property rights in order to protect the towns and communities faced with the dangers associated with these problems. The issue is not as clear as protecting environmental rights before property rights or vice versa. Instead, in order to effectively and efficiently protect both property interests and environmental interest, courts should adopt a multi-factor balancing test. The test should weigh the interests of both property and environmental issues to determine when it is adequate to compromise traditional property rights and which protective measures are permissible.