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Hold the High-Water Line: A Transnationally Informed Coastline Protection Scheme in the United States

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ABSTRACT

Climate change and sea level rise degrade the environment, infrastructure, and private property along US coastlines. The magnitude of these harms will only accelerate unless the United States improves its coastal protection scheme. Informed by approaches in Israel, the United Kingdom, and China, this Note offers a dynamic solution to coastline protection by way of a federal Rolling Coastal Conservation Easements Act. The act would authorize states to develop and implement rolling easements on private coastal properties. This flexible scheme would include compensation for those landowners who grant easements to their localities, while giving private property owners the option to deny the government's easement. This market-driven program gives states the notice, information, and transparency capacities to implement more meaningful and broad-reaching coastline protections by way of these rolling coastal conservation easements.

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I. INTRODUCTION

The beaches in the Carolinas are destined to become seabeds as rising sea levels consume the coast. Cost estimates to protect coastal communities in North Carolina alone are upwards of $35 billion.[1] Without swift and sufficiently funded action, retreat and abandonment will be the only viable option left for people in those coastal

1. CTR. FOR CLIMATE INTEGRITY RESILIENT ANALYTICS, HIGH TIDE TAX: THE PRICE TO PROTECT COASTAL COMMUNITIES FROM RISING SEAS (June 2019), https://www.climatecosts2040.org/files/ClimateCosts2040_Report-v4.pdf [https://perma.cc/X3YQ-33DR] (archived Feb. 15, 2020).

communities. Are the days of golf outings and sunbathing at South Carolina's Myrtle Beach coming to an end?

The struggle with sea level rise and the associated coastal erosion and flooding is not limited to the Carolinas, nor is it limited to the East Coast. These harms to persons, property, infrastructure, and the natural environment imperil every mile of coastline in the United States. The average individual cannot adequately defend the whole of his or her coastal property from sea level rise. It is the province of the federal and state legislatures, then, to address these inevitable intrusions and abate these potential damages caused by the rising sea. The takings clause in the U.S. Constitution grants the US government the power to take private property for public use in exchange for just compensation.[2] Coastline protection qualifies as such a public use. Constitutional legislation for coastline protection should begin with a basic framework informed by takings clause jurisprudence.[3]

Empirical evidence reflects the existence of climate change and sea level rise, and the accelerated nature of climate change is correlated to increased human activity.[4] Climate change's impacts are expansive and potentially devastating, and the accelerating rise of global sea levels poses considerable infrastructural and environmental risks.[5] Since 1992, the average rate of global ocean level rise has nearly doubled.[6] In the United States, the coastline degradation is inarguable and impending. The East, West, and Gulf Coasts will face ocean level rises that will harm and irreparably damage cities' infrastructure, the environment, economies, and the general welfare of the US population.[7] Other coastal nations are likewise experiencing the adverse effects of sea level rise. These countries are taking varied approaches—with ranging degrees of success—to address climate change's specific potential harm to their coastlines.

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2. U.S. CONST. amend. V.

3. This Note focuses on potential constitutional legislation for coastline protection, but does not explore the separate and robust inquiry of just compensation. For a further discussion of just compensation, *see, e.g.*, Christopher Serkin, *Existing Uses and The Limits of Land Use Regulation*, 84 N.Y.U. L. REV. 1222 (2009).

4. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, GLOBAL WARMING OF 1.5° C 4, 59 (Masson-Delmotte et al. eds., 2018) [hereinafter IPCC SPECIAL REPORT] (more than half of the current warming trend is "extremely likely" (greater than ninety-five percent likelihood) to be the result of human activity that occurred between 1951–2010).

5. *See id.* at 5.

6. *See* U.S. NAT'L CLIMATE ASSESSMENT, CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 9 (Jerry M. Melillo et al. eds., 2014), https://nca2014.globalchange.gov [https://perma.cc/9SXV-ELXJ] (archived Dec. 1, 2019) [hereinafter NAT'L CLIMATE ASSESSMENT US].

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

By analyzing the successes and failures of other coastal states, the United States can better inform its approach to coastline protection. Israel, the United Kingdom, and the People's Republic of China (China) all have diverse schemes for taking private coastal property to protect coastlines against sea level rise. Israel has an active and robust takings doctrine that includes a government-friendly compensation scheme. Common law and the broader legislative framework in the United States are derived from the United Kingdom. And China's authoritarian approach may offer opportunities for efficiency in a democratic solution in the United States. Each scheme contains valuable, importable qualities that can serve to improve the United States' coastal protection and compensation scheme. The different approaches taken by each country likewise include shortcomings the United States should learn from in developing its own protection program. By familiarizing itself with the legislative and judicial experiments of other nations, the United States can improve its compensation scheme without making duplicative errors. This Note proposes a new scheme informed by the approaches in Israel, the United Kingdom, and China, drawing from the benefits of limited compensation, notice and information distribution, and the concerted and efficient allocation of resources for coastline protection.

Part II of this Note lays out the background on the past, present, and future challenges of climate change adaptation and mitigation. Part III states the deficiencies in the current US coastline protection system, explores the traditional view of the US takings clause and regulatory takings, and explains why exactions will not work for a national coastline protection program. Part IV then surveys equivalent takings and coastline protection programs from Israel, the United Kingdom, and China. Part V analyzes the US scheme in relation to those of Israel, the United Kingdom, and China, discerning what the United States can learn from these countries in forming a better program. Part VI proposes the passing of the Rolling Coastal Conservation Easements Act. This federally instituted mechanism for coastline protection maintains the private property rights of the landowner while addressing the need for real, substantial infrastructural and environmental coastline protection. It is a market-driven approach propelled by notice, transparency, and autonomy for private landowners. Part VII concludes with thoughts on the future of coastline protection.

II. THE CURRENT STATE OF CLIMATE CHANGE AND SEA LEVEL RISE

There is overwhelming consensus among scientists that humans play a role in the acceleration of earth's warming.[8] The acceleration of global warming over recent decades is occurring at an unprecedented rate, with the current warming trend in part the result of anthropogenic pollution.[9] Since the late nineteenth century, the global mean temperature is up 1.62 degrees Fahrenheit, a "change driven largely by increased carbon dioxide and other human-made emissions into the atmosphere."[10] Extreme weather events are occurring more frequently and with greater force. Hurricane Florence in September 2018 devastated the East Coast of the United States and gave the southern coastal plain of North Carolina its monthly average rainfall in less than a week.[11] Typhoon Mangkhut—a category five typhoon with winds that exceeded two hundred miles per hour—devastated

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8. *See Scientists Agree: Global Warming is Happening and Humans are the Primary Cause*, UNION OF CONCERNED SCIENTISTS (Aug. 3, 2017), https://www.ucsusa.org/global-warming/science-and-impacts/science/scientists-agree-global-warming-happening-humans-primary-cause#.W9d5AhNKh0t [https://perma.cc/86ZP-RNBF] (archived Dec. 1, 2019); *More Say There is Solid Evidence of Global Warming*, PEW RESEARCH CTR. (Oct. 15, 2012), http://www.people-press.org/2012/10/15/more-say-there-is-solid-evidence-of-global-warming/ [https://perma.cc/YD3F-GFJR] (archived Dec. 1, 2019) (finding the gap between public perception and reality of climate change belief to be startling: fifty-seven percent of the US public either disagree with climate change or are unaware that scientists overwhelmingly agree that the earth is warming due to human activity).

9. *See* IPCC SPECIAL REPORT, *supra* note 4, at 4, 59 (more than half of the current warming trend is "extremely likely" (greater than ninety-five percent likelihood) to be the result of human activity that occurred between 1951–2010); *see also* NAT'L CLIMATE ASSESSMENT US, *supra* note 6, at 23 ("[T]he conclusion that human influences are the primary driver of recent climate change is based on . . . independent evidence").

10. NASA's Jet Propulsion Lab, *Climate Change: How Do We Know?*, GLOB. CLIMATE CHANGE, https://climate.nasa.gov/evidence/ (last updated Dec. 13, 2019) [https://perma.cc/4BKF-6NKD] (archived Dec. 27, 2019); *see* Climatic Research Unit, *Data: Temperature*, UNIV. OF E. ANGLIA, http://www.cru.uea.ac.uk/cru/data/temperature/ (last updated Jan. 2016) [https://perma.cc/J65V-W3US] (archived Dec. 1, 2019); *GISS Surface Temperature Analysis*, NAT'L AERONAUTICS & SPACE ADMIN. GODDARD INST. FOR SPACE STUDS., http://data.giss.nasa.gov/gistemp/ (last updated Oct. 17, 2019) [https://perma.cc/3U74-PVJ9] (archived Dec. 1, 2019); *see also NASA, NOAA Data Show 2016 Warmest Year on Record Globally*, NAT'L AERONAUTICS & SPACE ADMIN. GODDARD INST. FOR SPACE STUDS. (Jan. 18, 2017), https://www.giss.nasa.gov/research/news/20170118/ [https://perma.cc/3XSJ-MVKD] (archived Dec. 1, 2019) (five of the warmest years on record have come since 2010, and 2016 was the warmest year on record with monthly-temperature record-highs for eight of the twelve calendar months).

11. *See* Rebecca Lindsey, *How Do Rainfall Totals Predicted for Florence Compare to an Average September in the U.S. Southeast?*, CLIMATE.GOV (Sept. 14, 2018), https://www.climate.gov/news-features/featured-images/how-do-rainfall-totals-predicted-florence-compare-average-september-us [https://perma.cc/Z6VY-BJ77] (archived Dec. 1, 2019) (seven-day estimates exceeded twenty inches of rainfall in one week, while the region receives an average of approximately 5.4 inches each September).

homes, infrastructure, and killed upwards of one hundred people in the Philippines.[12] Ice sheets are melting and glaciers are retreating.[13] In the last decade, the rate of ice mass loss in Antarctica has tripled.[14]

Most prominent among the effects of climate change is global sea level rise. The warming of ocean temperatures, loss of ice from the glaciers and ice sheets, and the reduction of land storage of liquid water contribute to an increase in the oceans' volume, resulting in sea level rise.[15] The continued acceleration of climate change leads to startling future projections.[16] By the year 2100, projections of sea level rise range from 0.2 meters (0.66 feet) to 2.0 meters (6.66 feet).[17]

Dramatic increases in sea level have already impacted global coastlines. The United States will have to address the inevitable coastline erosion, the considerable reduction of geographic territory, the environmental degradation, and the economic harms associated with those losses. Climate change will have short-term, medium-term, and long-term effects on the American people in sectors ranging from water and energy to forests, ecosystems, human health, and land use.[18] Of primary concern for the United States are the coastal areas with accentuated regional sea level rise. These areas will see more pronounced consequences regardless of the ultimate sea level increase between 2020 and 2100.[19] Harms are being felt already, with "sunny day" high tide floods on pace to become the new normal on large stretches of US coastline. [20] King tides, where sun and moon

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12. Kristel Ringer Ortiz, *Typhoon Mangkhut Relief Update*, ASSEMBLIES OF GOD (Oct. 1, 2018), https://news.ag.org/en/News/Typhoon-Mangkhut-Relief-Update [https://perma.cc/7F3T-YYE4] (archived Dec. 1, 2019) (as of September 19, 2018, eighty-one people were confirmed dead with dozens still unaccounted for following Typhoon Mangkhut).

13. *See Ramp-Up in Antarctic Ice Loss Speeds Sea Level Rise*, NAT'L AERONAUTICS & SPACE ADMIN. JET PROPULSION LABORATORY NEWS (June 13, 2018), https://www.jpl.nasa.gov/news/news.php?feature=7159 [https://perma.cc/MAY7-TKEN] (archived Dec. 1, 2019) [hereinafter *Ramp-Up in Ice Loss*] (between 1993 and 2016, Greenland lost an average of 281 billion tons of ice per year while Antarctica lost approximately 119 billion tons per year).

14. *See id.*

15. *See* Jonathan Gregory et al., *2013: Sea Level Change, in* CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 1137 (2014).

16. *See, e.g.*, Gregory, *supra* note 15, at 1179–82; IPCC SPECIAL REPORT, *supra* note 4, at 4–5; NAT'L CLIMATE ASSESSMENT US, *supra* note 6, at 9.

17. NAT'L CLIMATE ASSESSMENT US, *supra* note 6, at 45.

18. *Id.* at 1–2.

19. Weiss et al., *supra* note 7, at 638 (given the maximum projection of 6.66 feet of sea level rise, there are twenty municipalities with populations greater than 300,000 and one hundred sixty municipalities with populations between 50,000 and 300,000 that have land area with elevations at or below six meters).

20. *See* Carolyn Gramling, *'Sunny Day' High Tide Floods Are on the Rise Along US Coasts*, SCIENCENEWS (July 15, 2019), https://www.sciencenews.org/article/sunny-day-high-tide-floods-are-rise-along-us-coasts [https://perma.cc/MRS9-A4XL] (archived Dec. 1, 2019) (citing a NOAA report that finds "sunny day" high tide flooding could be

alignments produce a higher-than-normal high tide, used to occur only a few times each year in Miami, Florida.[21] But with sea level rise they occur more frequently and at a greater magnitude.[22] King tides and more frequent flooding occur throughout the United States, especially in the northeast and southeast regions.[23] In some areas of the Florida Keys the local governments are no longer granting building permits, and in parts of Miami you can no longer get a long-term mortgage on purchased property.[24]

Suffice it to say, climate change will not go quietly. The particularized harms associated with sea level rise, erosion, and loss of infrastructure touch and concern many within the United States.[25] The volume of US coastal property at risk due to rising sea levels is alarming: more than $26 billion of home value alone is at risk in both Florida and New Jersey before the year 2045, not to mention the infrastructural, environmental, and economic losses associated with flooding and submersion.[26] Without a nationally coordinated coastline protection effort, the United States cannot expect to slow, let alone reverse, the destruction.

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the new normal by 2050, as "[f]rom 2000 to 2019, these 'sunny-day flooding' events jumped by 190 percent in the Southeast, and by 140 percent in the Northeast . . . . Such events can devastate coastal infrastructure . . . by disrupting traffic, inundating septic systems and salting farmlands."). "Sunny day" high tide floods are simply floods occurring on sunny days where there are no additional waters (such as from precipitation) contributing to the flooding. *See id.*

21. *See* Matthew Cappucci, *Sea Level Rise is Combining with Other Factors to Regularly Flood Miami*, WASH. POST (Aug. 8, 2019), https://www.washingtonpost.com/weather/2019/08/08/analysis-sea-level-rise-is-combining-with-other-factors-regularly-flood-miami/ [https://perma.cc/99UD-2YSX] (archived Dec. 1, 2019).

22. *See id.*

23. *See* Kevin Loria, *Cities Around the US are Flooding at High Tide and on Sunny Days at Record Rates — Here's What it's Like*, BUS. INSIDER (June 12, 2018), https://www.businessinsider.com/sea-level-rise-high-tides-sunny-day-flooding-coastal-cities-2018-4 [https://perma.cc/VL8V-3PPN] (archived Dec. 1, 2019) (noting the increased frequency and increased harms associated with king tide flooding in Annapolis, MD, Seattle, WA, Boston, MA, Galveston, TX, Queens, NY, San Francisco, CA, Charleston, SC, and many other populated US cities).

24. *See* Cappucci, *supra* note 21.

25. *See* NAT'L CLIMATE ASSESSMENT US, *supra* note 6, at 9.

26. *See US Coastal Property at Risk from Rising Seas*, UNION OF CONCERNED SCIENTISTS, https://www.arcgis.com/apps/MapSeries/index.html?appid=cf07ebe0a4c9439ab2e7e346656cb239 (last visited Jan. 6, 2020) [https://perma.cc/A54M-Z2PY] (archived Feb. 15, 2020).

III. REGULATORY TAKINGS AND COASTLINE PROTECTION IN THE UNITED STATES

The current US system of coastline protection is inadequate to mitigate the damage from rising sea levels. A significant limitation on protection success stems from the regulatory takings doctrine and its capacity as a vehicle for government action. Similarly, exactions (where the government "exacts" some benefit from a developer in exchange for approval of a permit), cannot be the basis for a national program of coastline protection because exactions cannot be used unless and until a developer applies for a development permit.

A. *Deficiencies in the Current US Approach to Coastline Protection*

Though the federal government has made some moves to address coastal erosion, none have yet achieved the necessary scope and durability for sustained success. [27] Thus much of the coastline protection project falls to states and municipalities. Certain states are taking affirmative steps to protect their coastlines from the harms of sea level rise. Following the devastation of Hurricane Sandy, New Jersey has implemented dredging and sand dune restoration plans to protect the shore from overwhelming and destructive natural disasters. [28] In Texas, the state legislature passed the Texas Open Beaches Act, creating "dynamic public easements" that move based on the vegetation line, preventing development within the easements. [29] But the Texas Supreme Court crippled the value of these rolling easements when deciding *Severance v. Patterson*, holding easements do not exist and roll if created by a sudden and rapid change (an "avulsion"), such as Hurricane Rita in 2005. [30] California established the California Ocean Protection Council (OPC) in 2004 "to help protect, conserve, and maintain healthy coastal and ocean ecosystems and the economies they support." [31] Despite the OPC's early successes, though,

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27. *See* John Upton, *Congress Wants to Stop Coastal Erosion—with Mud*, SCI. AM. (Feb. 14, 2017), https://www.scientificamerican.com/article/congress-wants-to-stop-coastal-erosion-with-mud/ [https://perma.cc/B68B-7HSN] (archived Dec. 1, 2019) (discussing Army Corps pilot projects with dredged sediments, based off a water infrastructure bill passed by the Congress weeks before the end of President Obama's administration).

28. *See* Rich Schapiro, *New Jersey Sand Dune Project May be Last Defense Against Another Sandy*, N.Y. DAILY NEWS (Oct. 26, 2017), https://www.nydailynews.com/news/national/n-sand-dune-project-defense-sandy-article-1.3591874 [https://perma.cc/9QWG-6PC5] (archived Dec. 1, 2019).

29. *See* Richard J. McLaughlin, *Rolling Easements as a Response to Sea Level Rise in Coastal Texas: Current Status of the Law after Severance v. Patterson*, 26 J. LAND USE & ENVTL. L. 365, 366–67 (2011).

30. *See* Severance v. Patterson, 566 F.3d 490, 502 (5th Cir. 2009) (finding Texas case law "fails to afford a consistent rationale for the creation or sustaining of a rolling beachfront easement").

31. A VISION FOR OUR OCEAN AND COAST, CA. OCEAN PROT. COUNCIL 4 (2004).

"huge investments" still need to be made to avoid the accelerated coastal erosion in California.[32]

These state-by-state approaches are laudable and necessary, but the United States needs a broader, federal framework to address the magnitude of impending harms. Because sea level rise has swollen to a level of national security concern,[33] it is within the purview of the federal government to engage the process and propose programs to address all of the infrastructural damage, environmental degradation, and property loss. Subpart B analyzes the history of regulatory takings in the United States and how the doctrine may provide guidance for establishing a federal coastline protection program.

B. *Applicable Takings Doctrine in the United States*

If the governing authority—be it federal, state, or local—intends to protect the coastlines, it must ask critical questions to ensure efficacy and sustainability. First, what kind of measures can that authority take? Second, how might those measures be challenged in court? And third, how would the courts respond to those challenges? To protect the coastlines from the ills of sea level rise, the implemented program or scheme must survive judicial scrutiny. The history of limiting—and taking—property rights from private property owners provides answers to these critical questions.

Regulatory takings jurisprudence gives context to the potential legality of the government taking private property for the public use of protecting US coastlines. Balancing tests and total wipeout thresholds indicate when just compensation will be owed to coastal private property owners.[34] All levels of government will need to weigh the potential universal property loss and diminished property value against the benefits of taking private property to protect the coastlines from sea level rise. The cost–benefit analysis may consider whether the government wants to proactively and preemptively physically occupy private land or instead wait for the rising oceans to cover coastline properties.

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32. *See* Ashley Spratt, *Coastal Protection on the Edge: The Challenge of Preserving California's Legacy*, CONVERSATION (Oct. 10, 2017), http://theconversation.com/coastal-protection-on-the-edge-the-challenge-of-preserving-californias-legacy-76927 [https://perma.cc/2A2L-H3J5] (archived Dec. 1, 2019).

33. *See* Jonathan B. Wiener, *Climate Change Policy and Policy Change in China*, 55 UCLA L. REV. 1805, 1822 (2008).

34. *See* Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1019, 1030 (1992) (holding a total wipeout of beneficial use of property is equivalent to a physical appropriation and is a per se taking); Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 124 (1978) (establishing the ad hoc balancing test for regulatory takings).

The U.S. Constitution prohibits the taking of private property for public use without payment of just compensation.[35] The taking of private property includes both physical takings[36] and takings by way of state and local government regulations.[37] The *Penn. Cent. Transp. Co. v. New York City* decision created the *ad hoc* balancing test that is used to determine whether a regulatory taking has occurred.[38] Stated simply, "if regulation goes too far it will be recognized as a taking," and would require just compensation.[39] In forming a program to protect the US coastlines, then, that question of what goes "too far" should be a constant consideration.

The *Lucas v. South Carolina Coastal Council* case demonstrates how and when coastline protection may go "too far," be identified as a taking by the court, and require just compensation to the private property owner.[40] In *Lucas*, the court determined that the Beachfront Management Act (BMA), which barred Lucas from erecting habitable structures on his privately owned beachfront property, totally deprived the property of all beneficial uses.[41] The court considered this to be equivalent to a physical appropriation,[42] rendering the BMA a *per se* taking.[43] With such a wipeout of value, the government is forced to pay just compensation to the harmed landowner.

If the government can avoid depriving private property owners of all beneficial uses, though, it can better avoid takings liability. In

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35. *See* U.S. CONST. amend. V; *see also Penn Cent.*, 438 U.S. at 124–38 (finding both physical takings and state and local regulation can constitute unconstitutional takings of private property requiring just compensation); Pa. Coal Co. v. Mahon, 260 U.S. 393, 415 (1922). It needs to be stated here that the question of quantifying just compensation is not addressed in this Note, as it a separate and distinct inquiry.

36. *See* Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 442, 445 (1982) (Blackmun, J., dissenting) (discussing how majority confirms the per se rule for takings based on "permanent physical occupation" of property). Physical occupation of property is where the government takes from the property owner a physical portion of the property: this can be by requiring the installation of cables as in *Loretto*, taking a portion of the property to build a public railroad, or many other physical occupations. *See id.*

37. *See Pa. Coal*, 260 US at 412, 415–16. Regulatory takings do not physically occupy property such as the cable in *Loretto*, but instead "take" part of the value of the property by way of limiting its uses. *See id.* The *Pennsylvania Coal* decision is a great example of a regulatory taking, where a law prohibiting mining underneath a property was held to be a taking by the U.S. Supreme Court, because the law went too far in taking away the company's right to exploit the underground portion of the property. *See id.*

38. *See generally Penn Cent.*, 438 U.S. 104.

39. *See Pa. Coal*, 260 US at 415.

40. *See* Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1019, 1030 (1992).

41. *See Lucas*, 505 U.S. at 1003, 1019, 1030.

42. *See Loretto*, 458 U.S. at 426 (describing physical appropriation as a physical occupation of all or a portion of private property, such as with telecommunications cables attached to apartment buildings as in the instant case. The court concludes, "permanent physical occupation authorized by government is a taking without regard to the public interests that it may serve").

43. *See Lucas*, 505 U.S. at 1019, 1030.

Palazzolo v. Rhode Island, the court held that a "significant diminution in value" is not a total economic wipeout.[44] The Supreme Court found no total economic wipeout in the case because the affected parcel maintained a distinct value in a particular area of the property.[45] And, though the court did not address the question of just compensation in this case, it indicated that compensation would be less than when a parcel is deprived of all beneficial uses.[46] This case stands for the proposition that even though regulation in furtherance of coastal protection may result in a diminution of property value, it may not rise to the level of a *per se*, total wipeout taking, if the property maintains a distinct beneficial use.

Prospective temporary limitation of a property's beneficial use may help the government avoid unfavorable court rulings on coastline protection regulatory programs. *Tahoe-Sierra v. Tahoe Regional Planning Agency* held that a moratorium on development imposed during the creation of a comprehensive land use plan did not constitute a *per se* taking, and the court will not conceptually sever a property's value for a given time period.[47] The two moratoria at issue in the case maintained the *status quo* of Lake Tahoe while the Tahoe Regional Planning Agency studied "the impact of development on Lake Tahoe and [designed] a strategy for environmentally sound growth."[48] *Tahoe-Sierra* clarifies that temporary land use restrictions may be takings, but that their temporary nature should "not be given exclusive significance one way or the other."[49] As such, regulations devised to protect coastlines and promote environmentally sound growth may have a defense against takings claims if they are framed as only temporary limits on private property rights.

In 2010, the U.S. Supreme Court indicated that the government's right to control coastal erosion and renourish the coastline may be superior to the rights of private landowners.[50] *Stop the Beach Renourishment v. Florida Dept. of Environmental Protection* centered

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44. *See* Palazzolo v. Rhode Island, 533 U.S. 606, 629–32 (2001) (deciding that a huge diminution in value (reduced to $200,000 in development value) is not a total wipeout when *some* other use of the property still exists. This raises the bar for what is considered a *per se* taking under *Lucas* and the total economic wipeout framework).

45. *Id.* at 629 (finding a distinct value remained in the property as the landowner could still build on the upland portion of the property as it was not included in the salt marsh determination).

46. *See* Tahoe-Sierra Pres. Council v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 330–31, 335–37 (2002) (holding that there is no total economic wipeout and no conceptual severance of time, as the court addresses the spatial value of the property only, and will not divide it into both space and time).

47. *See id.* at 1486.

48. *Id.* at 1470.

49. *Id.* at 1486.

50. *See generally* Stop the Beach Renourishment, Inc. v. Fla. Dep't. of Envtl. Prot., 560 U.S. 702 (2010).

on the question of littoral property rights.[51] The Florida Legislature passed the Beach and Shore Preservation Act in 1961 (BSPA), intending to create procedures for beach restoration and renourishment projects by depositing sand on eroded beaches (considered restoration) and maintaining the deposited sand (considered renourishment). [52] The BSPA established an erosion control line, essentially limiting any more common law increase of property by way of accretion. [53] In reviewing the Florida Supreme Court's decision upholding the BSPA, the Supreme Court held there was no judicial taking, as the state held property rights on the coast and the renourishment process did not eliminate the rights of coastal landowners.[54] It appears the state's right to renourish and protect the coastline is not considered a taking when it does not infringe on the subordinate rights of the private landowner.

If notice of future public use is given to a private landowner, they are not owed just compensation for improvements they make on their property after the notice has been given. In *In re Furman Street*, the city of Brooklyn, New York, established a street-mapping plan that included a to-be-constructed-in-the-future Furman Street. [55] Landowners challenged the street mapping because they received compensation only for the land taken for the streets, and not for the structures they had built on those prospective streets. [56] The landowners had notice of the locations of the future street construction *before* they decided to build structures on those portions of their properties.[57] The court held the city did not need to compensate the landowners for the improvements they made on the land where the city had mapped Furman Street.[58] Subsequent case law has affirmed the state's power to map public uses and not be required to compensate owners who still choose to improve their land.[59]

Given takings clause jurisprudence in the United States, a coastline protection program must be cognizant of when a regulation

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51. *See id.* at 708 (littoral property rights are those concerning properties that abut static water like an ocean, lake, or bay. The case addressed specifically the distinction between accretions (the slow, gradual, imperceptible growth or erosion of coastline) and avulsions (sudden erosion or development of coastline).).

52. *See id.* at 709.

53. *See id.*

54. *See id.* at 731.

55. *See In re* Opening Furman St., 17 Wend. 649, 651–52 (N.Y. Sup. Ct. 1836).

56. *See id.* at 659.

57. *See id.*

58. *See id.* at 657.

59. *See generally* Palm Beach Cnty. v. Wright, 641 So. 2d 50 (Fla. 1994); Headley v. City of Rochester, 5 N.E.2d 198 (N.Y. 1936) (holding a small restriction on a large lot to be constitutional); Rochester Bus. Inst., Inc. v. City of Rochester, 267 N.Y.S.2d 274 (N.Y. App. Div. 1966) (finding a mapping regulation creating a marginal increase in a landowner's construction costs to be constitutional); *In re* District of Pittsburgh, 2 Watts & Serg. 320 (Pa. 1841) (finding street mapping a valid exercise of government power for public use).

might go too far, thus requiring just compensation. By maintaining beneficial uses on coastline properties, the government can avoid instances where judicial decisions find a regulation to be a *per se* taking, immediately triggering liability. Prospective temporary limitations on property development can also limit potential liability. Finally, the scheme would benefit from explicit notice to private landowners of potential future public uses for coastline restoration and protection.

C. *Exactions Are an Insufficient Option for a National Protection Program*

Municipalities can use exactions to "exact" some benefit from a developer in exchange for approval of a permit, site plan, or rezoning request.[60] These requirements on the developers can range from on-site dedications, such as new public water lines, to fees-in-lieu-of-dedication.[61] In theory, an exaction could require a developer to take necessary protective steps for coastline preservation when developing on a coastal parcel.

The judiciary evaluates the constitutionality of an exaction under a multistep framework established primarily in *Nollan v. California Coastal Commission* and *Dolan v. City of Tigard*.[62] In *Nollan*, the Supreme Court failed to see an essential nexus between the required easement and a legitimate governmental interest.[63] The majority concluded that "if [the municipality] wants an easement across the Nollans' property, it must pay for it."[64] In the *Dolan* case, the Supreme Court distinguished the essential nexus in *Nollan* from a separate "rough proportionality" requirement.[65] The court found an essential nexus for the exaction at issue, but determined that the benefits conferred to the municipality by the exaction were not proportional to the harm the developed land would create.[66]

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60. *See* Vicki Been, *"Exit" As A Constraint on Land Use Exactions: Rethinking the Unconstitutional Conditions Doctrine*, 91 COLUM. L. REV. 473, 473 (1991).

61. *See id.* at 478–80.

62. *See* Dolan v. City of Tigard, 512 U.S. 374, 391 (1994) (building on the *Nollan* exaction test, the court adds a "rough proportionality" requirement to survive judicial scrutiny: that an exaction must be roughly proportional to the harm the development is creating or imposing); Nollan v. Ca. Coastal Comm'n, 483 U.S. 825, 837 (1987) (establishing that exaction constitutionality requires an "essential nexus" must exist between the exaction and a legitimate state interest).

63. *See Nollan*, 483 U.S. at 829, 841–42 (the exaction at issue in *Nollan* was an easement on a piece of coastal property that would increase access to the public beachfronts and parks).

64. *Id.* at 842.

65. *Dolan*, 512 U.S. at 392.

66. *Id.* at 378–80 (a hardware store owner sought expansion of his business, but the city conditioned permit approval on dedicating ten percent of the property for flood

Though exactions are an option to effect coastline protection, they are insufficient in magnitude and scope to be a part of an impactful national scheme. For a municipality to use exactions, there must be a party requesting approval of a permit, a new site plan, or rezoning of a coastal parcel.[67] This precondition to coastline protection limits the immediacy and scope of exactions. Moreover, the rough proportionality condition established in *Dolan* likely requires municipalities to produce studies reflecting the harm imposed by a development.[68] But with the harms of sea level rise, the development itself is not creating or imposing the harm—the rising tide is. Such exactions would struggle to survive judicial scrutiny, as challengers (the developers) would correctly argue that their development is not causing the harm. The government may have a colorable argument that the development is creating and imposing a potential future harm to the environment and infrastructure at the coastline, but that reasoning seems too tenuous for a court to presently endorse.

IV. LAND USE AND COASTLINE PROTECTION SCHEMES IN ISRAEL, THE UNITED KINGDOM, AND CHINA

Sea level rise is a global problem as coastal countries throughout the world are faced with the prospects of diminished landmass, infrastructure, and ecology. Countries with vastly different economies, populations, and governments have devised and implemented various coastal protection schemes. Exploring the programs of Israel, the United Kingdom, and China can—in light of their property regimes—inform potential US approaches. Israel is one of the few countries in the world with an active and robust takings doctrine that includes a government-friendly compensation scheme. US common law and broader legislative framework are derived from the United Kingdom. China's authoritarian approach to regulation and coastal protection may exemplify certain efficacious measures that could be part of a democratic solution for the United States.

In reviewing the schemes in these countries, the same critical questions remain: What measures are available to these governmental authorities? How could—and have—these measures been challenged in their respective judicial systems? How will courts respond to these legal challenges? The responses to these questions in other nations can inform and enlighten a better US approach.

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control and the creation of a bike pathway easement, as the back portion of the parcel lay within a hundred-year floodplain).

67. *See generally* Been, *supra* note 60 (because exactions are to "exact" some benefit from a developer in exchange for granting a permit or a re-zoning request, that implicitly requires such a permit request or re-zoning request to occur before an exaction can be attached).

68. *See Dolan*, 512 U.S. at 392.

A. *Israel's Broad Takings Doctrine Features Minimized Compensation Obligations*

1. The Legal History of Israel's Takings and Compensation Doctrine

Israel is a "parliamentary democracy" consisting of a legislature (the Knesset parliament), an executive (the presidency), and a judiciary (the Supreme Court of Israel).[69] Though Israel does not have a constitution *per se*, the Knesset gradually codified constitutional rules as the "Basic Laws," which are treated as having constitutional status.[70] Section 3 of the Basic Laws states "there shall be no violation of the property of the person."[71] As the Israel Supreme Court expanded the above statement's scope and attached to it a broad scheme of takings compensation, Israel has developed "one of the world's most generous laws on compensation rights."[72]

The British introduced the Town Planning Ordinance (the Ordinance) to Israel in 1936,[73] and from the Ordinance compensation rights for property "takings" were born. The Ordinance stated: "any person whose property is injuriously affected by [a] scheme other than the expropriation thereof may . . . claim compensation in respect of such injury" by serving a notice in writing to the Local Commission.[74] This notion of betterment and compensation, which eventually died off in future British legislation, endured as part of Israeli domestic law following the establishment of the state in 1948.[75] When the Knesset adopted the Planning and Building Law in 1965, it adopted the language of the Ordinance almost verbatim.[76] In a 1966 Israel Supreme Court decision, Justice Agranat said: "One can say that the right to compensation not only carries today a universal character, but stands on a pedestal . . . of a 'basic right'; this is so even though there

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69. *Israeli Democracy & Elections*, EMBASSY OF ISR. PRETORIA, https://embassies.gov.il/pretoria/AboutIsrael/State/Pages/Israeli-democracy.aspx (last visited Feb. 20, 2019) [https://perma.cc/7RP5-VCSN] (archived Dec. 1, 2019).

70. Rachelle Alterman, *When the Right to Compensation for "Regulatory Takings" Goes to the Extreme: The Case of Israel*, 6 WASH. U. GLOBAL STUD. L. REV. 121, 124–25 (2007) [hereinafter Alterman, *Right to Compensation*]; *see also* Basic Laws of Israel: Human Dignity and Liberty, 5752-1992, SH No. 1391, https://www.jewishvirtuallibrary.org/basic-law-human-dignity-and-liberty [https://perma.cc/48H9-AU37] (archived Dec. 1, 2019).

71. Alterman, *Right to Compensation*, *supra* note 70, at 126.

72. *Id.* at 122.

73. *Notice under the Town Planning Ordinance*, PALESTINE GAZETTE, Sept. 3, 1936, at 1067–71 [hereinafter *Town Planning Ordinance*].

74. Alterman, *Right to Compensation*, *supra* note 70, at 124 (citing the *Town Planning Ordinance*, *supra* note 73).

75. *See id.*

76. *See* The Planning & Building Law, 5725-1965, SH No. 79 (Isr.); Alterman, *Right to Compensation*, *supra* note 70, at 124.

is no [written] constitutional dictum to this effect."[77] With this basic right of compensation for taken property established, the Basic Laws and Supreme Court jurisprudence color the doctrine's continued expansion.

The 1965 Planning and Building Law lays out the compensation scheme under Section 197, specifying the qualifications for a violation and under what circumstances a landowner can raise a claim for compensation.[78] A violation of property rights is constitutional—and therefore no claim may be made—if the violation passes the following four conditions:

> (1) It is enacted in a law or in subsidiary legislation authorized by law; (2) it befits the values of the State of Israel; (3) it is for a proper purpose; (4) it is of an extent no greater than necessary.[79]

If the conditions are not satisfied, Israeli property owners with adversely affected real estate "shall be entitled to compensation from the Local Commission."[80] This compensation has progressively broadened into a consistently applied major legal doctrine. The High Court of Justice and the Supreme Court interpret this protection to cover not only eminent domain "but also regulation of land use."[81] For any new law or amendment to an existing law concerning property to survive a constitutional challenge, it has to pass the four-pronged test.[82]

Injury is measured by "comparing the appraised economic value of the property under the previous plan to its value under the new or amended plan."[83] The pith in this language lies with the alteration of an existing plan.[84] In *Birenbach v. Tel Aviv*, the Israel Supreme Court decided that parties "did not have a right to receive compensation because the existing plan had not been altered," and thus "landowners do not have the right to demand that an amendment be approved."[85] Even though Israel's compensation scheme remains broad, the determination of what constitutes an altered plan is often up for debate.[86] Without a clear standard to determine when an existing plan

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77. Alterman, *Right to Compensation*, *supra* note 70, at 125.

78. *See* The Planning & Building Law.

79. Alterman, *Right to Compensation*, *supra* note 70, at 126 (quoting Israel Basic Law).

80. *Id.* at 130.

81. RACHELLE ALTERMAN ET AL., TAKINGS INTERNATIONAL: A COMPARATIVE PERSPECTIVE ON LAND USE REGULATIONS AND COMPENSATION RIGHTS 35 (2010).

82. *See id.*

83. Alterman, *Right to Compensation*, *supra* note 70, at 135.

84. *Id.* at 132, 136.

85. *Id.* at 136 (citing CA 483/86 Birenbach v. Tel Aviv Local Comm'n 42(3) PD 288 (1987) (Isr.)).

86. *Id.* at 135–36 (discussing the limitations on the *Birenbach* case's precedential value, as there is no bright line at which a plan is then deemed altered by the court).

becomes an "altered plan," the constitutionality of takings for coastline protection is undetermined.

Israel's greatest divergence from the United States in takings doctrine exists in Section 197 of the Basic Laws, where there appears to be no requirement of compensation for property taken by expropriation.[87] Local governments in Israel have the authority to expropriate up to 40 percent of any private property without compensation.[88] If they exceed that 40 percent threshold, the government is only required to compensate for the takings that exceed that 40 percent.[89] This bright line appears to better protect governmental action where land in private hands is designated for a typically public use.[90] Using eminent domain in this manner is a necessary component to "overcom[ing] holdout problems" when trying to effectively and efficiently carry out a public development project.[91] In practice, the Israeli Supreme Court still "performs legal acrobatics" with cases involving complex "land-use . . . expropriation, compulsory dedication of land, developer agreements, and land readjustment" to avoid finding the government liable for compensation.[92] Given the scheme's structure, Israel can take land for public use and have no obligation to pay compensation when it takes less than 40 percent of the parcel.

2. Climate Change Legislation in Israel

Israel has only 170 miles of coastline, all of which runs along the eastern side of the Mediterranean Sea.[93] Israel is also one of the most population-dense countries in the world, averaging 395 people per square kilometer.[94] In light of Israel's limited coastal resources and the densely expansive population, the Knesset passed the Protection of the

87. *See id.* at 138–39.

88. *See* Ronit Levine-Schnur & Gideon Parchomovsky, *Is the Government Fiscally Blind? An Empirical Examination of the Effect of the Compensation Requirement on Eminent-Domain Exercises*, 45 J. LEGAL STUD. 437, 439, 444 (2016).

89. *See id.* (where, for example, "when the government chooses to take 45 percent of a lot, it is required to pay compensation for 5 percent (45 percent minus 40 percent) of the property's market value.").

90. *See* Alterman, *Right to Compensation*, *supra* note 70, at 139.

91. Levine-Schnur & Parchomovsky, *supra* note 88, at 441.

92. Alterman, *Right to Compensation*, *supra* note 70, at 139.

93. *See Geography Statistics of Israel*, WORLD ATLAS, https://www.worldatlas.com/webimage/countrys/asia/israel/illandst.htm (last visited Oct. 31, 2019) [https://perma.cc/HDW7-XB3N] (archived Dec. 1, 2019) (reporting 169.63 miles of coastline).

94. *See* ISRAEL POPULATION 2020, WORLD POPULATION REVIEW, http://worldpopulationreview.com/countries/israel-population/ (last visited Feb. 22, 2020) [https://perma.cc/BNL4-8LH6] (archived Feb. 22, 2020).

Coastal Environment Law (PCEL) in 2004.[95] The PCEL outlines three main objectives: to protect the environment, preserve the coasts, and establish sustainable coastal management and use programs.[96] The PCEL addresses both public and private coastal properties, prohibiting damage to the coastal environment or carrying out "any act that might damage it."[97] It defines "coastal environment" as: from twelve miles inside Israel's territorial waters up to three hundred meters inland.[98] Man-made activity that causes significant change to the natural processes or preservation of the coastal environment is considered "damage."[99] Early jurisprudence on the PCEL confirmed that even though the "shore area" is only considered to be the first one hundred meters of beach front, construction between the 100–300 meters inland range should be weighed and considered against the harms to the coastal environment.[100]

But a recent change to the PCEL has Israeli citizens frustrated for both environmental and recreational reasons. The Planning Administration's new Master Plan allows extensive construction and development on previously protected beaches along Israel's coast.[101] In the new plan, the hundred-meter coastline ban on construction remains, but most of the protections that existed for the coastline between 100–300 meters have been lifted.[102] This plan weakens beachfront and coastal protections while opening up more opportunities for developers. Public pressure has made the Israeli government hesitant to develop in the previously protected areas, with public advocacy helping preserve what little beachfront is available.[103]

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95. *See* Tzvi Levinson et al., *The Israeli Protection of the Coastal Environment Law: A Step Towards Sustainability*, 36 ENVTL. POL'Y & L. 1, 1 (2006).

96. *See id.* ("1. To protect the coastal environment, its natural and heritage assets, to restore and preserve them as a resource of unique value, and to prevent and reduce as far as possible any damage to them; 2. To preserve the coastal environment and the coastal sand for the benefit and enjoyment of the public, for present and future generations; 3. To establish principles and limitations for the sustainable management, development and use of the coastal environment.").

97. *Id.*

98. *Id.* at 2.

99. *Id.*

100. AdminC (Hi) Co. for Dev. & Constr. Ltd. v. Haifa Dist. Planning Comm'n. (2005) (Isr.) (the court confirmed a committee decision to not allow construction of a fuel state 120 meters inland, even though the "shore area" is only defined as the area up to 100 meters inland).

101. *See* Zafrir Rinat, *Environmentalists Fight to Foil Construction on Israel Beaches*, HAARETZ (Feb. 22, 2016), https://www.haaretz.com/israel-news/.premium-greens-press-kahlon-to-stop-beach-projects-1.5407521 [https://perma.cc/YQ4G-3WDH] (archived Dec. 1, 2019).

102. *See id.*

103. *See* Reuben Lewis, *What's Israel Doing to Protect its Mediterranean Coastline?*, CULTURE TRIP (Nov. 15, 2017), https://theculturetrip.com/middle-east/israel/articles/whats-israel-doing-to-protect-its-mediterranean-coastline/ [https://perma.cc/9Q6E-RJMM] (archived Dec. 1, 2019) (the Israeli public only has access to approximately 10 of the 122 miles of Mediterranean coastline in the state).

In 2011, lawmakers approved a half billion–dollar coastal cliff protection program for cliffs between Hadera and Ashkelon.[104] These cliffs are in immediate danger of erosion.[105] The plan includes traditional protection measures like beach renourishment, geotechnical treatment, and realignment of infrastructure.[106]

Beyond action plans and master plans to limit the degradation of beachfronts and cliffs, Israel's jurisprudence and legislation on taking property for coastline protection is limited. With so little coastline open to the public, there is little opportunity for the government to use expropriation or land use measures to reclaim land for coastline protection.[107]

B. *The United Kingdom: A Nonexistent Takings Doctrine*

1. A Limited History of the United Kingdom's Property Compensation

The United Kingdom no longer employs a takings doctrine that entitles property owners to compensation. Instead, purchase notices and blight notices provide limited recourse and compensation for affected land.[108] With shifting legislation on the question of property rights and coastal protection, the United Kingdom presents a number of plans and initiatives aimed at protecting coastlines from flood and erosion.

Under the current Town and Country Planning law in the United Kingdom, landowners "have no direct legal right to compensation for any financial loss caused by the particular designation of land in a

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104. *See Coastal Protection*, ISR. MINISTRY ENVTL. PROT., http://www.sviva.gov.il/English/env_topics/marineandcoastalenvironment/Protecting-the-Coast/Pages/default.aspx (last updated Apr. 24, 2014) [https://perma.cc/5W8A-U5YC] (archived Dec. 1, 2019) [hereinafter MINISTRY OF ISRAEL COASTAL PROTECTION].

105. *See Coastal Erosion*, ISR. MINISTRY ENVTL. PROT., http://www.sviva.gov.il/English/env_topics/marineandcoastalenvironment/Protecting-the-Coast/Pages/The-Coastal-Cliff.aspx (last updated Aug. 6, 2015) [https://perma.cc/83TL-QP9M] (archived Dec. 1, 2019) (The cliffs are retreating by dozens of centimeters each year, while some are already collapsing, endangering both people and infrastructure. Persistent erosion and cliff-collapses are the product of the constant crashing of waves, the continued development of infrastructure, and tourism.).

106. *See id.*

107. *See* Lewis, *supra* note 103 (most of Israel's coastline is occupied by infrastructure such as power plants, military bases, and natural gas and desalination plants, which are not open to public use).

108. *See* Michael Purdue, *The Law on Compensation Rights for Reduction in Property Values Due to Planning Decisions in the United Kingdom*, 5 WASH. U. GLOBAL STUD. L. REV. 493, 493 (2006) (on the subject of purchase notices); *Planning Blight and Blight Notices*, SHELTER SCOT., https://scotland.shelter.org.uk/get_advice/advice_topics/repairs_and_bad_conditions/compulsory_purchase_orders_cpos/blight_notices (last visited Feb. 20, 2019), [https://perma.cc/CY5L-WB8A] (archived Dec. 1, 2019) (describing the form and function of blight notices in the UK).

development plan."[109] The Town and Country Planning Act of 1947 created a compensation scheme for when "existing uses" were limited by planning and land use decisions.[110] But with the Planning and Compensation Act of 1991, Parliament abolished nearly all compensation for losses, as well as compensation for the refusal of planning or development permissions.[111] Access to compensation for lost value is now limited to small and specific categories of redress: purchase notices and blight notices.

A purchase notice affords a landowner the opportunity for compensation for an "adverse development control decision."[112] This scheme, however, is rarely used and does not often net much compensation.[113] To employ a purchase notice, a landowner serves the local authority with a notice that the authority is legally required to purchase the land from the landowner.[114] To succeed on a purchase notice claim, the land must have become "incapable of reasonable beneficial use in its existing state."[115] Satisfying the incapable of beneficial requirement can be an exceedingly high threshold.[116] The U.K. Court of Appeals held that being able to maintain a garden on a residential property is a beneficial use, while land limited to only natural tree growth has a beneficial use in forestry.[117] These purchase notices are well defended against, and also rarely arise.

A blight notice provides a landowner the opportunity to force the local public authority to buy their home if public development affects the homeowner's property value.[118] A planning blight is typically the product of a planned public development like a new motorway, railway line, energy plant, or another public usage affecting the value of one's property.[119] This claim is served to the local public authority, but such notices can only be served if (1) land falls in a specific category of blighted land, and (2) the person serving the notice has a "qualifying interest."[120]

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109. Purdue, *supra* note 108, at 493.

110. *Id.* at 494–95.

111. *See id.* at 494; Alterman, *Right to Compensation*, *supra* note 70, at 124. *See generally* Planning and Compensation Act 1991, c. 34 (Eng.).

112. Purdue, *supra* note 108, at 502–503.

113. *Id.* at 503.

114. *See Purchase Notice*, THOMPSON REUTERS PRACT. L., https://uk.practicallaw.thomsonreuters.com/0-383-1033?transitionType=Default&contextData=(sc.Default)&firstPage=true&comp=pluk&bhcp=1 (last visited Feb. 20, 2019) [https://perma.cc/Y4KY-79AJ] (archived Dec. 1, 2019) (describing a purchase notice in England and/or Wales).

115. Town and Country Planning Act 1990, c. 8, §137 (Eng.).

116. *See generally* Colley v. Sec'y of State for the Env't (1999) 77 P. & C.R. 190 (AC) (Eng.).

117. *Id.* at 199–200.

118. *See Planning Blight and Blight Notices*, *supra* note 108.

119. *See id.*

120. *See* Town and Country Planning Act 1990, c. 8, §149 (Eng.) ((1) the land must fall within one of the specified categories of blighted land, which includes typical public

Once the above qualifications are satisfied, the blight notice can move forward. Compensation is no guarantee, though, as a claimant has to prove "injurious [effect]" to the property for the Parliament to pay compensation for "alleviation of hardship caused by public works."[121] This alleviation typically takes the form of severing the harmed portion of the property from the land owned by the claimant, and compensating the claimant for that portion of property.[122] Should UK coastline protection measures create potentially redressable circumstances, blight notices may be the only path for private property owners to receive compensation.

2. Climate Change Legislation in the United Kingdom

Concerns with coastline property in the United Kingdom are immediate.[123] To help address and hopefully solve coastal flooding and erosion harms, the United Kingdom established the Committee on Climate Change (CCC) through the Climate Change Act of 2008.[124] The CCC is charged with devising the protective approach for the coastlines.[125] The CCC made five recommendations for managing coastal erosion and flooding, including acknowledgement of the implications of future coastal change, the need for the government and its agencies to cooperate on long-term strategies, and the needs for funds and plans to manifest the goals.[126] Thus far, the United Kingdom

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services such as schools, and (2) the person serving the blight notice must have a "qualifying interest."); *see also* Purdue, *supra* note 108, at 508.

121. Purdue, *supra* note 108, at 511.

122. *See id.*

123. *See* COMM. ON CLIMATE CHANGE, MANAGING THE COAST IN A CHANGING CLIMATE 23 (2018) [hereinafter MANAGING THE COAST UK] (today, 520,000 properties in England (370,000 of which are residential) are in coastal areas with significant annual risk of coastal flooding, with 8,900 properties located in areas at risk from coastal erosion); *Current Approach to Protecting England's Coastal Communities from Flooding and Erosion Not Fit for Purpose as the Climate Changes*, COMM. ON CLIMATE CHANGE (Oct. 26, 2018), https://www.theccc.org.uk/2018/10/26/current-approach-to-protecting-englands-coastal-communities-from-flooding-and-erosion-not-fit-for-purpose-as-the-climate-changes/ [https://perma.cc/2DYD-Z3JC] (archived Nov. 9, 2019) [hereinafter CCC *Current Approach*] (sea level is anticipated to rise by one meter around the island as early as the year 2100).

124. *See* MANAGING THE COAST UK, *supra* note 123, at 42.

125. *See* CCC *Current Approach*, *supra* note 123 (outlining Shoreline Management Plans to reform the country's coastline).

126. *See id.* ("The scale and implications of future coastal change should be acknowledged by those with responsibility for the coast and adequately communicated to people living on the coast. Local Government and the Environment Agency must work with affected communities to develop realistic long-term strategies that are rigorously implemented in Local Plans, regulations and projects. The UK government's approach to the management of coastal flooding and erosion risk needs to change. A new approach should be long-term, evidence-based, and include the views of coastal communities. The government should make long-term funding and investment available to protect coastal cities and infrastructure, restore more coastal habitats and help affected communities

is having varied success with the implementation of these recommendations.

Following the Climate Change Act of 2008, the United Kingdom has passed a number of laws relating to flood and water management and flood risk regulation. Chief among these are the Flood and Water Management Act of 2010 and the Flood Risk Regulations of 2009.[127] These laws provide funding.and guidance to "develop, monitor, review, and update" both local and national Flood and Coastal Erosion Risk Management (FCERM) strategies.[128] The UK government has also created a six-year Investment Programme of 2.3 billion pounds to support the FCERM goals.[129] The FCERM strategies have steered development away from flood and erosion risk areas, but the process lacks sufficient information distribution and public notice and does not compensate "for losses of property from coastal erosion."[130] The CCC has stated, though, that it intends to communicate to coastal property owners the "scale and implications of future coastal change," especially considering the United Kingdom does not intend to "take" any coastal property, nor compensate owners for those losses.[131] In much of the new legislation, the United Kingdom has been intentional about transparency and notice to its citizens.

Critics of the CCC are concerned with sufficient and consistent buy-in across governmental departments. The CCC has informed many policy debates—for example, on questions of renewable energy and flooding—but its material impact on the outcomes of those debates is unclear.[132] The London School of Economics' ten-year review of the Climate Change Act recommends aligning the United Kingdom's policy with its Paris Agreement commitments, while accelerating emissions reduction to get back on pace with the United Kingdom's 2020s and 2030s emissions targets.[133] The lack of a unified policy is stunting the United Kingdom's ability to adapt policy efficiently.[134] However, the United Kingdom laudably intends to keep the public thoroughly

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cope with inevitable changes. Plans to manage and adapt specific shorelines over the coming century should be realistic and sustainable in economic, social and environmental terms.").

127. *See* MANAGING THE COAST UK, *supra* note 123, at 42–43.

128. *Id.* at 43.

129. *Id.* at 50.

130. *Id.* at 52–53.

131. *Id.* at 69.

132. *See* SAM FANKHAUSER ET AL., 10 YEARS OF THE UK CLIMATE CHANGE ACT 1–5 (2018).

133. *See id.* at 5 (noting that political and societal consensus should be aligned with the objectives of the Climate Change Act and the Paris Agreement).

134. *See* Policy Research Corp., *Country Overview and Assessment: United Kingdom*, *in* THE ECONOMICS OF CLIMATE CHANGE ADAPTATION IN EU COASTAL AREAS 1, 7 (2009) (describing policy initiatives that exist to defend the coast despite the lack of an over-arching national plan).

informed on coastline protection policy and developments through distributional networks.

C. *The People's Republic of China: An Authoritarian Approach to Widespread Erosion*

1. Private Property Rights in the People's Republic of China

The Chinese Constitution declares a citizen's "lawful private property" right is "inviolable."[135] It is the state's duty to protect "the rights of citizens to private property and to its inheritance."[136] On paper this appears an unequivocal protection of private property rights for citizens. Article 10 of the Chinese Constitution clarifies the picture within the socialist regime.[137] The article states: "land in the cities is owned by the state."[138] Rural land is owned by "collectives" overseen by the government.[139] Furthermore, the government may "expropriate or requisition land" for state use. [140] According to the Chinese Constitution, such a requisition by the state shall require the government to "make compensation for the land expropriated or requisitioned." [141] In many instances, this requisition and compensation manifests in a pattern of forcible displacement in order to make way for economic development projects.[142]

Requisition in China is equivalent to eminent domain in the United States, but the doctrine in China lacks a consistent standard of application for sufficient comparison. [143] Though the Chinese Constitution formally limits requisition to items of "public interest," the practice of requisitions is one where "legal rules are either ignored or relaxed . . . [and] rarely preclud[e] local governments in China from requisitioning rural land for industrial or commercial development."[144] The inconsistent application of the practice is also the product of broad, authoritarian constitutional interpretation. Because "public interest"

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135. XIANFA [CONSTITUTION] arts. 12, 13 (2018) (China).
136. *Id.* at art. 13.
137. *See id.* at art. 10 (describing land owned by the state).
138. *Id.*
139. *Id.*
140. *Id.*
141. *Id.*
142. *See* Ilya Somin, *The Conflict Over Takings and Property Rights in China and its Parallels with That in the United States*, VOLOKH CONSPIRACY (Aug. 8, 2014), https://www.washingtonpost.com/news/volokh-conspiracy/wp/2014/08/08/the-conflict-over-takings-and-property-rights-in-china/ [https://perma.cc/K3WK-6ZDG] (archived Nov. 9, 2019) (arguing that the Chinse government undertakes economic development takings on a larger scale than the US government).
143. *See* Shitong Qiao & Frank Upham, *The Evolution of Relational Property Rights: A Case of Chinese Rural Land Reform*, 100 IOWA L. REV. 2479, 2498 (2015) (noting that restriction of land requisition to public interest is largely ignored).
144. *Id.*

has not been explicitly defined, the Chinese government can label economic, development, and construction projects to be in the "public interest" with little resistance.[145] This gives the government the final say on questions of eminent domain and compensation for a requisition.

2. Climate Change Legislation in the People's Republic of China

The Communist Party has ruled China since 1949.[146] Their authoritarian dictation of legislation and enforcement allows a more efficient revision and implementation of climate change legislation.[147] The government passes legislation and it is enacted in a timely manner. There is hardly a system of critique or pushback from local authorities.[148]

To address the issue of coastal erosion, China organized the 908 Special Project in 2004.[149] This large-scale marine survey intended to gather and analyze data for a basic theoretical understanding of coastal erosion.[150] The project succeeded and resulted in the collection of highly precise data on China's coastline, maritime disaster risks, and renewable energy resources, while also creating new topographic maps of China's coastline.[151] Scientific evaluation of the data is aimed at the "establishment of a 'digital coast'" and the "building of a fundamental database for coastal protection."[152] China relayed this new data into action through an Integrated Coastal Zone Management Plan, which is considered a "dynamic, multidisciplinary and iterative

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145. *See* Zhu Keliang et al., *The Rural Land Question in China: Analysis and Recommendations Based on a Seventeen-Provence Survey*, 38 N.Y.U. J. INT'L L. & POL. 761, 780, 827–28 (2006) (arguing that takings logic cannot be applied effectively in the case of the Chinese government).

146. *See* Amber Pariona, *What Type Of Government Does China Have?*, WORLD ATLAS (Apr. 25, 2017), https://www.worldatlas.com/articles/what-type-of-government-does-china-have.html [https://perma.cc/W737-ENF8] (archived Nov. 9, 2019).

147. *But see* Dana Varinsky, *The Owners of These Defiant 'Nail Houses' in China Refuse to Give in to Developers*, BUS. INSIDER (Aug. 20, 2016), https://www.businessinsider.com/what-are-chinese-nail-houses-2016-8 [https://perma.cc/Z537-4MAC] (archived Nov. 9, 2019) (where in a number regions of China, "[s]ome people refuse to leave their homes," and buildings are considered nail houses in an area where development progresses, because they "stick out like a nail that can't be hammered down." It is important to note that these compensation offers are coming from developers, though, and not the Chinese government directly.).

148. Hualing Fu, *Building Judicial Integrity in China*, 39 HASTINGS INT'L & COMP. L. REV. 167, 170–71 (2016).

149. *See* Feng Cai et al., *Coastal Erosion in China Under Condition of Global Climate Change and Measures for its Prevention*, 19 PROGRESS IN NAT. SCI. 415, 421–22 (2008).

150. *See id.* (describing processes used to analyze and create a theoretical understanding of coastal erosion patterns).

151. *See id.* (describing the compilation of digital coastline data and maritime disaster risks).

152. *Id.*

process to promote sustainable management of the coastal zones . . . it covers the full cycle of information collection, planning (in its broadest sense), decision making, management and monitoring of implementation."[153] With a singular governmental entity providing oversight, implementation is more efficient and consistent.

China's primary source of law for environmental protection is the Environmental Protection Law of the People's Republic of China (EPL).[154] Following a significant amendment in 2014, the EPL is now considered the strictest environmental protection law in China's history and one of strictest in the world.[155] Article 1 of the EPL declares the law's purpose of protecting and improving the environment, and facilitating the sustainable development of economy and society.[156] The 2014 revisions added enhanced responsibilities for environmental pollution prevention and increased both criminal and civil punishments for violation of environmental laws.[157] The revision also "established the environmental public interest lawsuit regime."[158]

More recently, China published its first Environmental Protection Tax Law, imposing taxes on "production units that emit air and water pollution, noise pollution, and solid waste."[159] The government elected to charge polluters with an environmental protection tax instead of charging a fee.[160] This allows the government to improve the tax intake while removing some of the previous exemptions.[161] Enforcement of the law began January 1, 2018.[162] Concurrently in 2017, China created a market to trade credits for the right to "emit planet-warming greenhouse gases," a program not so unlike trade credit programs in the United States.[163]

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153. *Id.* at 423.

154. *See* Cheng Xiaofeng et al., *China*, LAW REVS.: THE ENV'T & CLIMATE CHANGE L. REV. ED. 3 (Feb. 2019), https://thelawreviews.co.uk/edition/the-environment-and-climate-change-law-review-edition-3/1179632/china [https://perma.cc/CE59-W9AZ] (archived Nov. 9, 2019).

155. *See id.*

156. *See id.*

157. *See id.* (noting increases in reporting requirements, civil recourse avenues, and criminal penalties in the newly amended law).

158. *Id.*

159. Mehran Idris Khan & Yen-Chiang Chang, *Environmental Challenges and Current Practices in China—A Thorough Analysis*, SUSTAINABILITY 1, 11 (2018).

160. Laney Zhang, *China: New Law Replacing Pollution Discharge Fee with Environmental Protection Tax*, LIBRARY OF CONG.: GLOB. LEGAL MONITOR (Feb. 8, 2017), https://www.loc.gov/law/foreign-news/article/china-new-law-replacing-pollution-discharge-fee-with-environmental-protection-tax/ [https://perma.cc/3KCQ-5PLE] (archived Nov. 9, 2019) [hereinafter LOC CHINA].

161. *See* Khan & Chang, *supra* note 159, at 13 (reflecting the government's intention to increase its net tax intake).

162. *See* LOC CHINA, *supra* note 160.

163. Keith Bradsher & Lisa Friedman, *China Unveils an Ambitious Plan to Curb Climate Change Emissions*, N.Y. TIMES (Dec. 19, 2017),

Specifically for coastal protection, China passed "Regulations on the Management of Coastline Protection and Utilization" (the Regulations) on March 31, 2017. [164] The Regulations filled the prominent gaps in China's coastal management model that existed because of the competing interests "between coastal protection and development." [165] For coastal sustainable development, the Regulations created an industrial control index for "sea use" construction projects.[166] As a precursor to the Regulations, the State Oceanic Administration (the Administration)—in concert with the Chinese Ministry of Finance—set up "protection funds" for coastline renovation and rehabilitation projects.[167] The funds initiated more than 230 renovation and repair projects between 2011 and 2015.[168] The Administration has also established strict requirements for sea use projects occupying the coastline.[169]

China's conversion from a passive and decentralized management model to this new, active regulation and management program should yield results in coastline protection. The measures put forward by the Administration aim to solve "protection and utilization problems," while the system benefits from unified governmental oversight not stymied or stagnated by bureaucracy.[170] Uniformity of protection and utilization standards will help China slow, halt, and perhaps even reverse the physical and economic effects of coastal erosion.

V. ANALYSIS: HOW THE UNITED STATES CAN INFORM A NEW COASTLINE PROTECTION SCHEME

In pursuit of a legal and practical defense against the harms of sea level rise, the United States must contend with three major obstacles: (1) private property rights; (2) public opinion—both with concerns of doing too much and doing too little; and (3) judicial review. So much of individual privacy and autonomy in American legal history grows out of the bundle of property rights, and any action taken by the government in furtherance of coastal protection needs to acknowledge

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https://www.nytimes.com/2017/12/19/climate/china-carbon-market-climate-change-emissions.html [https://perma.cc/68E8-424S] (archived Nov. 10, 2019).

164. Liang Liu et al., *Problems and Countermeasures of Coastline Protection and Utilization in China*, 153 OCEAN & COASTAL MGMT. 124, 125 (2018).

165. *Id.* at 124–25.

166. *Id.* at 127.

167. *Id.*

168. *See id.*

169. *See id.* (The government maintains strict control and requires a demonstration of the sea area use. The Administration requires "that sea use projects minimize the occupation of coastline", and the necessity of construction projects "should be strictly demonstrated." Justification for occupation of the coastline is also required.).

170. *Id.* at 129.

and assess the impact on those rights.[171] As for public opinion, the US government is stuck between the absolute property right interest and the belief that government should always be doing more affirmative work to protect the environment—both for the protection of the environment itself and the protection of human beings. With judicial review the courts will scrutinize the constitutionality of legislative action for coastal protection. Legislators need to be conscious of the language and scope of their regulations, as affected landowners will raise challenges to the legislation.

The regulatory and compensation doctrines of Israel, the United Kingdom, and the People's Republic of China can inform an improved US approach to coastline protection. But any such development must be filtered through the above obstacles. There may be approaches that provide solutions. In practice, however, the federalist, bureaucratic, social, and judicial structure of the US system presents unique challenges to adopting doctrines and practices from other nations.

A. *By Learning from Israel's Limited Liability Takings Scheme*

Israel is one of the only other countries in the world with a robust takings and compensation doctrine.[172] US takings doctrine and compensation exists through judicial interpretation and balancing,[173] while Israel outlines the four conditions for a potential right to compensation explicitly in its Planning and Building Law.[174] Compensation itself is often disjointed and inconsistent in US jurisprudence.[175] Israel, on the other hand, determines injury by comparing the value of the property under the previous plan or legal scheme versus its changed value under the new or amended plan.[176] Their system also greatly benefits the government, where any taking

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171. Exclusion is one of the most absolute and essential property rights. *See generally* Jacque v. Steenberg Homes, Inc., 209 Wis. 2d 605, 617 (Wis. 1997). Other rights include the right to sell or transfer, *see generally* Andrus v. Allard, 444 U.S. 51 (1979), and the right to destroy property, *see generally* Matthews v. Bay Head Improvements Assoc., 471 A.2d 355 (N.J. 1984).

172. *See* Alterman, *Right to Compensation*, *supra* note 70, at 122 (arguing that Israel's position represents "an extreme in 'property rights friendliness'").

173. *See* Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 105 (1978) (creating a multi-factor balancing test for courts to determine whether a taking has occurred).

174. *See* Basic Laws of Israel: Human Dignity and Liberty, 5752-1992, SH No. 1391, https://www.jewishvirtuallibrary.org/basic-law-human-dignity-and-liberty [https://perma.cc/48H9-AU37] (archived Dec. 1, 2019); The Planning & Building Law, 5725-1965, SH No. 79 (Isr.).

175. *See, e.g.*, Wheeler v. City of Pleasant Grove, 833 F.2d 267, 271 (11th Cir. 1987) (applying multiple factors of analysis to determine whether regulatory takings are appropriate).

176. *See* Alterman, *Right to Compensation*, *supra* note 70, at 135.

of less than 40 percent of a parcel requires no compensation to the property owner.[177]

Israel's lack of compensation requirement for property taken by expropriation serves as valuable guidance for a new US approach.[178] Israel's municipalities have the authority to expropriate up to 40 percent of any private property without providing compensation.[179] And if that threshold is exceeded, the government is liable for the taking in excess of that 40 percent.[180] Under US doctrine, "just compensation" is required regardless of the mode of the takings.[181] For Israel, the challenge arises in framing coastline protection as a public use under the Basic Law. In the United States, those "legal acrobatics" should not require nearly as much flexibility, as coastline protection and property defense should have no trouble being considered a public use.[182] But when the Israeli government takes 25 percent of a coastal parcel for public use, it owes the private landowner nothing. In the United States, taking or burdening 25 percent of a parcel may still result in compensation liability.

Israel passed the PCEL in 2004 with the intent to preserve the coastal environment, both for the benefit and enjoyment of the public and to "establish principles and limitations" for "sustainable management, development, and use."[183] The PCEL created a framework to address both public and private lands, giving the government and localities the authority to act on its stated aims.[184] The PCEL echoes sentiments in the US Coastal Zone Management Act of 1972 (CZMA), passed to encourage coastal states to develop and implement coastal zone management programs (CZMPs) that bound

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177. *See* Levine-Schnur & Parchomovsky, *supra* note 88, at 439.

178. *See* Alterman, *Right to Compensation*, *supra* note 70, at 138–39 (arguing that the lack of compensation for property taken by expropriation is more easily administrated); *see also id.* (noting that property law in Israel provides a unique opportunity to empirically test its validity).

179. *See* Levine-Schnur & Parchomovsky, *supra* note 88, at 439, 444.

180. *See id.*

181. U.S. CONST. amend. V.

182. *See* Mugler v. Kansas, 123 U.S. 623, 668–69 (1887) (holding if property is taken for the express purpose of harm prevention—something considered "injurious to the health, morals, or safety of the community"—then there is no taking, no appropriation of property, and no requirement for just compensation). *See generally* Palazzolo v. Rhode Island, 533 U.S. 606 (2001) (finding regulation limiting development on salt marshes to be a sufficient public use); Lucas v. S.C. Coastal Council, 505 U.S. 1003 (1992) (finding the state's passing of a statute for the renourishment of the beaches and coastline to be a public use); Penn Cent. Transp. Co. v. New York City, 438 U.S. 104 (1978) (finding the creation of a landmark status for historic buildings in New York City to be a public use).

183. Levinson et al., *supra* note 95.

184. *See id.* at 1–2 (noting that the PCEL creates permit issuance and enforcement mechanisms for relevant authorities).

both state and local governments to action.[185] Just as the CZMA has led to development of local CZMPs in thirty-two states,[186] the PCEL has led to coastal cliff protection programs,[187] and for local citizens to be heard in the coastal protection process.[188] Cooperation between the national and local governments in Israel's approach to coastal management should encourage the US government that coastline protection can be effective in a more bureaucratic regime.

However, the United States should be wary of adopting Israel's approach to limiting compensation to a threshold. Even though it may be advantageous to argue that any expropriated land is not entitled to compensation, this goes directly against decades of US takings jurisprudence, would likely result in public outcry, and stands against the bundle of private property rights paramount to the American system of governance.

Drawing a bright line of "no compensation" for a taking at 40 percent—or any other percentage number—would be unwise in a new US coastline protection regime as the absolute right of property is endemic in the United States.[189] The government would certainly save money if the new approach included broad protection of governmental actions and a reduced or altogether zeroed-out compensation requirement for smaller "takings." Any approach the United States might take to limit compensation needs to be nuanced and constitutionally justifiable given the intricacies of the regulatory takings doctrine.[190] Even viewing private property rights in the most limited manner, taking private property without compensation goes against not only jurisprudence but also the U.S. Constitution.[191] Such a dramatic shift in takings compensation would likely lead to protest, similar to when Israel tried to amend the PCEL to reduce the inland

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185. *See* Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–1465, *amended by* Pub. L. No. 109-58 (2005) (creating a framework for implementing coastal zone management agencies at the federal, state, and local level).

186. *See Coastal Zone Management Programs*, NATIONAL OCEANIC & ATMOSPHERIC ADMIN., https://coast.noaa.gov/czm/mystate/ (last visited Feb. 15, 2019) [https://perma.cc/M4F7-7SF8] (archived Nov. 10, 2019).

187. *See* MINISTRY OF ISRAEL COASTAL PROTECTION, *supra* note 104 (noting that a coastal cliff protection program is one of the results of the PCEL).

188. *See* Lewis, *supra* note 103 (regarding the public outcry and uproar when Israel tried to amend the PCEL to reduce the area of coastline statutorily protected from construction and development).

189. *See* Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 431–33 (1982) (noting that an owner is entitled to an absolute and undisturbed possession of every part of a property's premises). *See generally* Jacque v. Steenberg Homes, Inc., 209 Wis. 2d 605, 617 (Wis. 1997) (stating that inherent in the bundle of property rights is the absolute right to autonomous control, including the exclusion of others from the property).

190. *See supra* Part III, sec. B.

191. *See* U.S. CONST. amend. V (stating that property cannot be seized without just compensation).

shore area protected from development.[192] Even though coastal protection and combatting climate change sit at the fore for many citizens, this would be perceived as governmental overreach and stunt coastal protection progress.

As for judicial review, the United States must be cautious about passing legislation that would dramatically alter existing property rights and takings doctrine.[193] If the United States passed legislation similar to Israel's expropriation laws, it would be scrutinized under the *Penn. Central* balancing test[194] and evaluated for total deprivations of beneficial uses.[195] Though it is not entirely clear at what point a threshold for noncompensation would go "too far,"[196] the courts would be critical of a scheme that in itself drew a bright line for noncompensation.

Learning from negative public responses in Israel,[197] the United States should embrace a more proactive system of coastal protection. When it includes a taking or occupation of private property, just compensation will need to be provided—and should be included in any cost–benefit analysis when promulgating new laws and coastal protection schemes. Though creating a new US approach that requires no compensation when taking more limited percentages of land parcel would reduce the overall cost of coastline protection, the legal and democratic backlash makes a bright-line rule change untenable. At the very least, the United States can be conscious and highly sensitive to the quantity of property taken, and the compensation it intends to pay out to private landowners.

B. *By Creating a Better Notice and Information Distribution System Like that of the United Kingdom*

Distinct from the United States, the United Kingdom has no modern takings doctrine.[198] The United States' robust jurisprudence is born from old English precedent, but such laws have since disappeared from the United Kingdom. The once prominent Town and Country Planning laws in the United Kingdom entitled landowners to compensation when existing uses became limited by government

192. *See* Rinat, *supra* note 101 (noting that environmental groups admonished the decision to lift protection from beaches previously protected from development).

193. *See* Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 105 (1978) (solidifying an ad hoc balancing test for regulatory takings in the United States).

194. *See id.* (using a multi-factor balancing test).

195. *See* Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1019, 1030 (1992) (holding that if a regulation results in the total wipeout of the economic value of a property, it is akin to a physical appropriation and is a per se taking).

196. *See* Pa. Coal Co. v. Mahon, 260 U.S. 393, 414–15 (1922) (avoiding a concrete definition of when a regulation goes "too far").

197. *See* Rinat, *supra* note 101 (noting that environmental groups admonished the decision to lift protection from beaches previously protected from development).

198. *See* Purdue, *supra* note 108, at 493.

action, but that has been written out of their domestic law.[199] US takings doctrine remains alive and well, and despite outstanding questions, takings claims are raised frequently in state courts. The only compensatory regimes persisting in the United Kingdom are purchase notices and blight notices, but these paths of redress are small, specific, and largely limited in availability.[200] The injurious effect required for compensation with blight notices[201] far exceeds the typical American threshold for a judicial finding of takings and the necessitation of just compensation.[202] The United States cannot simply decommission its takings doctrine to limit compensation to the extent the United Kingdom has limited compensation.

Climate change and sea level rise pose comparable risks for both the United Kingdom and the United States in terms of the magnitude of localized harms. The United Kingdom could see more than half a million coastal properties consistently flooded by the year 2100.[203] With more than one hundred cities with populations greater than fifty thousand at elevations at or below six meters above sea level, the United States stands to lose considerable property, people, environment, and infrastructure.[204] The United Kingdom's establishment of the CCC presented its five recommendations for managing coastal erosion, and initiated a more concerted effort in the United Kingdom to address this issue.[205] Followed by the Flood Water Management Act of 2010 and the Flood Risk Regulations of 2009, the Parliament is promulgating laws to "develop, monitor, review, and update" strategies to prevent coastal erosion.[206] The CCC and subsequent acts are similar to the Coastal Zone Management Act in

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199. *See id.* at 495–96 (describing the removal of the provision that granted automatic permission for changes of use).

200. *See id.* at 511 (noting that the only situations in which compensation is available are those involve "injurious affection"); *Planning Blight and Blight Notices*, *supra* note 108 (noting that citizens may be able to force the government to buy private property if a purchase notice or blight notice is given); THOMPSON REUTERS PRACT. L., *supra* note 114 (describing the definition of a purchase notice).

201. *See* Purdue, *supra* note 108, at 511 (noting that injurious affection could be the result of adverse consequences on neighboring land of both construction and public works).

202. *See, e.g.*, Pa. Coal Co. v. Mahon, 260 U.S. 393, 415–16 (1922) (describing how a taking of private property for public use requires just compensation when the taking is by way of a state or local governmental regulation, and is not limited to physical occupations).

203. *See* MANAGING THE COAST UK, *supra* note 123, at 11 (noting that the efforts in the CCC report could save nearly 500,000 coastal properties from consistent flooding by 2100).

204. *See* Weiss et al., *supra* note 7, at 636, 638.

205. *See* CCC *Current Approach*, *supra* note 123.

206. MANAGING THE COAST UK, *supra* note 123, at 43.

the United States,[207] but the UK approach benefits from fewer federalism concerns and fewer affected people. Even though it is hard to see the CCC's material impact today,[208] the US scheme can learn from the CCC's intention to circulate the "scale and implication of future coastal change" to coastal property owners.[209] By adopting a more transparent notice and information distribution network, the United States could better explicate and underscore the forthcoming harms to coastal property owners.

This more transparent notion of notice and information from the United Kingdom, coupled with the takings compensation scheme in the United States, could ensure a more material impact of any coastal protection regime in the United States. The United Kingdom's purchase and blight notices are too limited in their scope and compensation to apply in the United States, but the United Kingdom's commitment to the defense of private property rights is central to US law. Improved notice of potential harms (i.e., flooding and erosion) to coastal property owners would maintain the United States' consciousness for strong private property rights while giving coastal landowners sufficient information to inform their decisions.

C. *By Establishing Uniform Protection and Utilization Standards Like Those in China*

Despite China's constitutional language regarding private property rights and "public interest" requisitions, takings are ultimately noncompensable when the state maintains a public interest in development.[210] To learn from the Chinese approach the US should look beyond China's takings and compensation history. With more than eleven thousand miles of coastline, China is acutely aware of the scale of harms associated with sea level rise.[211] With a comparable coastline in terms of miles, the US scheme can learn from the direct and intentional approach of the Chinese government.[212] Likewise, the potential destabilization of politics in China if flooding and erosion

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207. *See* Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–1465, *amended by* Pub. L. No. 109-58 (2005) (creating federal and state incentives to address coastal erosion).

208. *See* FANKHAUSER ET AL., *supra* note 132, at 4 (arguing that the CCC needs to be more concretely brought in line with Paris Climate Agreement and Brexit).

209. MANAGING THE COAST UK, *supra* note 123, at 69.

210. *See* Qiao & Upham, *supra* note 143, at 2498 (noting that government takings are allowed when they are in the public interest).

211. *See* Cai et al., *supra* note 149, at 416 ("The continental coastline of China extends for about 18,000 km.").

212. *See* Rebecca Harrington, *We Have No Idea How Big the US Coastline Really Is*, BUS. INSIDER (Oct. 13, 2015), https://www.businessinsider.com/how-big-is-the-us-coastline-2015-10 [https://perma.cc/L9JL-A2PK] (archived Nov. 11, 2019) (noting that according to the US Census the general US coastline is 12,383 miles, while the shoreline is 88,633 miles).

become pervasive is not so unlike the contentious political situation in the United States where many believe the government is doing too little to address the harms of climate change.[213]

China's commitment to information gathering and informed legislation on climate change is laudable. The 908 Special Project, which began in 2004, collected highly precise data not only on China's coastline but also the project built a database of fundamental information for coastal protection.[214] China then put this data to action through an Integrated Coastal Zone Management plan aimed at sustainably protecting coastal zones going forward. [215] Such a comprehensive survey of coastal data would help frame coastal protection legislation in the United States, but with current bipartisanship on the question of climate change, Congress is unlikely to allocate funds for a data-gathering mission. The United States has settled for the promulgation of the Coastal Zone Management Act, which authorizes the states to create coastal management zones as they see necessary.[216]

Most severe among China's program are the civil and criminal punishments associated with violations of the EPL.[217] The EPL even allows for public interest lawsuits related to environmental matters.[218] Whether or not criminal liability for violations of coastal protection even makes sense for the United States, it is unlikely any such legislation could ever pass in Congress. As for public interest lawsuits, there exists some precedent in the United States for standing for such litigation, but expanding standing simply would not do enough to support coastal protection action. [219] On the question of coastal development, China's limitations on sea-use construction projects through the Regulations may be informative to US policy. [220] By limiting coastal development, the United States could limit the proliferation of infrastructure in high-risk coastal areas. The United States also can learn from China's "protection funds" which accounted

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213. *See* Wiener, *supra* note 33, at 1822 (arguing that the Chinese government could sustain political losses from inaction on the international stage even if the domestic losses are comparatively small).

214. *See* Cai et al., *supra* note 149, at 421–22 (describing coastal protection data).

215. *See id.* at 423 (noting that sustainability of coastal resource use should be a primary concern).

216. *See* Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–1465, *amended by* Pub. L. No. 109-58 (2005) (creating discretionary Coastal Zone Management funds for states).

217. *See* Xiaofeng et al., *supra* note 154 (noting increases in civil and criminal punishments for violations of the EPL).

218. *See id.* (describing the establishment of the environmental public interest lawsuit regime).

219. *See generally* Massachusetts v. EPA, 549 U.S. 497 (2007) (allowing states to bring a suit to force a government agency to regulate pollutants).

220. *See* Liu et al., *supra* note 164, at 127 (noting a robust system for examination and approval of sea use projects on the Chinese coastline).

for more than two hundred renovation and coastal repair projects from 2011–2015.[221] The United States needs to find a way to allocate and accumulate funds for coastal renourishment, rehabilitation, and armoring. Taxes are always an option in the theoretical sense, but there would be great resistance to any such proposal, and taxes may not be the most efficient way to generate those funds.

The United States cannot simply adopt the Chinese approach for myriad reasons, chief among them the federalist, democratic construction of the US government. An authoritarian approach to coastline protection—or any other issue for that matter—will never stand in the US system. The United States could benefit, though, from taking a more direct, notice-driven approach to coastal protection and distribution of information. Moreover, a clear funding and expectation regime would afford clarity, transparency, and the capital necessary to successfully protect the US coasts.

VI. SOLUTION: THE ROLLING COASTAL CONSERVATION EASEMENTS ACT

A better approach to US coastal protection should be informed by the practicable and productive practices elsewhere. Even in divergent governance schemes, there are lessons to be learned. Israel's robust takings doctrine and limits on compensation illustrate the United States' need to be wary of overcompensating for takings of coastal property, and how the United States can be more proactive in its coastal protection framework. The United Kingdom's commitment to notice and information distribution regarding coastal erosion from sea level rise not only helps citizens protect their property rights but also helps defend the nation's infrastructure and economy. China's authoritarian regime is incompatible with a democratic republic, but the United States should learn from their direct, explicit, and transparent approach to coastal protection and their commitment to funding these goals.

A new approach must adhere to the rule of the U.S. Constitution, jurisprudential history, and the federalist system. Given the domestic precedent, and the particularized adoption of transnational approaches, this Note proposes the federal implementation of a Rolling Coastal Conservation Easements Act (RCCEA), which will authorize the states to pass Rolling Coastal Conservation Easement (RCCE) legislation to effect coastline protections while justly compensating property owners. The RCCEA reflects the qualities of transnational regimes with domestic practicability, and balances those against private property rights, public opinion, and future judicial review.

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221. *See id.* at 127 (noting that the Chinese Ministry of Finance and the State Oceanic Administration set up protection fund for islands and sea areas within its coastline renovation and rehabilitation projects).

Under the RCCEA, much like the US Coastal Zone Management Act, the federal government would authorize state governments to create and implement RCCEs on private property situated along the coastlines.[222] States would then determine the size of these RCCEs based on local data on sea level's impact.[223] The easement would be situated for a certain distance from the mean high-water line into the private property. Within the easement would exist a critical-loss line—this being a state-determined point at which sea level rise poses such a considerable risk that the state must immediately burden that portion of private property with an easement to implement renourishment and protection measures.[224] This limited intrusion draws from Israel's expropriation doctrines and their ability to limit the government's compensation liability. Once a state passes legislation creating and authorizing RCCEs, notice of the details and scope of RCCEs would be distributed to all private coastal property owners, similar to how the United Kingdom distributes information on the "scale and implications of future coastal change" under the CCC.[225]

With the information distribution, the property owner will have a decision to make. First, the property owner could grant the RCCE and give it immediate effect. With such a decision, the government would pay compensation based on the percentage of the parcel being burdened and the diminution of value on that specific portion of the parcel of land.[226] Basing compensation on a combination of percentage and value-loss reflects both US regulatory takings doctrine and Israel's

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222. *See* Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–1465, *amended by* Pub. L. No. 109-58 (2005) (allowing states to administer conservation easements in private property along coastlines). The Coastal Zone Management Act has not been found to be unconstitutional, and so framing the RCCEA as a federal statute authorizing state action is rooted in environmental protection precedent.

223. Because this a cooperative and state-driven solution, data on local sea level impact would need to come from a variety of sources including the municipalities and state agencies. This Note does not recommend a specific data-gathering organization, nor does it necessarily suggest that states have uniform collection processes.

224. This Note does not propose a specific mechanism or process by which state and local governments would determine the necessary scope of the easements, nor the delimitation of the *critical loss line*. The assumption is that the expertise and capacity lies within the state and local governments to make a holistic determination based on the acute harms associated with each state's coastline, and the potential remedies and protection for the coasts.

225. MANAGING THE COAST UK, *supra* note 123, at 69.

226. *See* Tahoe-Sierra Pres. Council v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 329–31 (2002) (noting that if a percentage of the property is taken, that portion is assumed to be taken in its entirety); Wheeler v. City of Pleasant Grove, 833 F.2d 267, 271 (11th Cir. 1987) (evaluating the question of compensation for what an owner has "lost" in a regulatory taking). Funding for just compensation is a delicate question not addressed in this Note; some states may deem a tax—perhaps on purchases of coastal properties—the most efficient and acceptable method. Others may create a fund that becomes a line item in the fiscal year budget. Such a determination would be left entirely up to the states to establish in the way most fitting to their citizens.

expropriation doctrine.[227] The government would also stipulate that the RCCE would not grant the government power to do anything with the easement other than protect the coastline—the government would not be allowed to, say, construct a bike path or require additional public access to a beach with the RCCE.[228] The private property owner would likewise be limited in their use of the easement, generally to foot traffic and nonpermanent improvement that would have no adverse impact on the coastal protection measures.

The property owner's second option would be to outright refuse to grant the RCCE to the state or local government. By including informational distribution and disclosure schemes from China and the United Kingdom into the RCCEs, landowners will have empirical data on the scope and impact of sea level rise to inform their decision.[229] If they choose to refuse the RCCE, the government cannot take the easement. But if the mean high-water line reaches the critical-loss line, the government would then be granted the full easement from the property owner without any compensation requirement. Because property owners would have considerable notice of a potential future RCCE—and the understanding that sea level rise is an incremental process where the mean high-water line may not reach the critical-loss line for decades—coastline property owners would be forced to give the easement to the government without compensation. This is a calculated risk some property owners may be willing to take—by not granting the RCCE and receiving compensation at the outset, those landowners would be betting that sea levels will never rise to the critical-loss line. Or, more cynically, that sea levels will not rise to that critical-loss line as long as they own the property, and so the burdening easement would be the subsequent owner's problem.

This coupling of notice and therefore no subsequent compensation for any development on a prospective RCCE would derive legitimacy from US street-mapping precedent.[230] This notice and

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227. *See* Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 105 (1978) (where the US regulatory takings ad hoc balancing test looks to diminution of value and the investor's expectations of value in the property); Alterman, *Right to Compensation*, *supra* note 70, at 138 (on Israel's expropriation scheme); Levine-Schnur & Parchomovsky, *supra* note 88, at 439, 444 (on the forty percent threshold for receiving compensation).

228. *See* Dolan v. City of Tigard, 512 U.S. 374, 411–14 (1994) (finding the imposition of a bike pathway easement to address local traffic concerns was not roughly proportional to the public good the city was seeking to address); Nollan v. Ca. Coastal Comm'n, 483 U.S. 825, 837–39 (1987) (holding that the creation of a requirement that a property provide walking access to a public beach when public beach access is already available lacks an essential nexus to the state's public interest).

229. *See* Cai et al., *supra* note 149, at 421–22 (describing the database of fundamental information for coastal protection China developed as part of the 908 Special Project); MANAGING THE COAST UK, *supra* note 123, at 69 (on the distribution of information on the "scale and implication" of coastal erosion in the UK).

230. *See In re* Opening Furman St., 17 Wend. 649, 657 (N.Y. Sup. Ct. 1836) (stating that "if the legislature did not intend that the street should be opened at a future period without paying for improvements made upon them in the meantime", the provision

noncompensation scheme is a warning to any coastal landowners considering the risks of refusing to grant the government an RCCE on their property. If the mean high-water line reaches the easement's critical-loss line, the locality will burden the parcel with an RCCE, and the landowner will receive no compensation for any structures or improvements within the easement. Nor will they receive the compensation they would have received had they granted the RCCE at the outset.

Moreover, those landowners who refuse to grant the RCCE initially will have certain preconditions attached to their property. If they do not accept this easement for the express limited purpose of coastline property protection, the landowner will forfeit future Federal Emergency Management Agency (FEMA) assistance in the case of flooding or coastal erosion that could have been mitigated by granting the RCCE. [231] Moreover, this will likely create payout issues for landowners through their flood insurance, especially if insurance agencies consider the access to an RCCE as an opportunity for the homeowner to mitigate any future damage.

Because combating sea level rise will be an enduring and persistent conflict, framing RCCEs in a prospectively temporary manner may not be enough to avoid liability if landowners challenge them in court. But, if possible, states can look to precedent like *Tahoe-Sierra* for guidance on language in the state legislation. [232] By establishing the RCCEs as existing only for as long as is necessary to establish and maintain coastline renourishment and protection, local governments may be better insulated from takings claims by landowners who challenge the compensation associated with the

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creating the street mapping to provide notice to landowners was "worse than useless"); *In re* District of Pittsburgh, 2 Watts & Serg. 320, 324 (Pa. 1841) (finding street mapping a valid exercise of government power for public use, and that "the mere laying of [streets] out cannot be said, of itself, to be a taking of the property of the individuals, upon which they are laid out, for public use at some future day, but rather a designation of what may be required for that purpose thereafter." This affords owners the opportunity to be "fully apprised of what is anticipated," to properly "regulate the subsequent improvements, which they shall make thereon, accordingly."); *see also* Trent Andrews, *Official Maps and the Regulatory Takings Problem: A Legislative Solution*, 2011 BYU L. REV. 2251, 2254 (citing the *In re Furman Street* court's holding that compensation should be refused to the landowner that had built and developed on the mapped street).

231. *See generally Individual Disaster Assistance*, FED. EMERGENCY MGMT. AGENCY, https://www.fema.gov/individual-disaster-assistance (last visited Feb. 20, 2019) [https://perma.cc/CD82-KWDQ] (archived Nov. 11, 2019) (noting the circumstances in which individuals can qualify for individual assistance). This Note does not attempt to establish what would be considered flooding or erosion that would have been prevented or mitigated by the granting of the RCCE. Establishment and implementation shall be left to experts who are better equipped to manifest such requirements.

232. *See* Tahoe-Sierra Pres. Council v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 335–37 (2002) (describing a "fairness and justice" inquiry in an analysis of regulatory takings).

easements. Though these easements would not be a moratorium on development *per se*, they can be framed as a necessary temporary government action to efficiently establish environmental and infrastructural protections.

The Texas state legislature passed a beach protection program, which included a rolling easement that was struck down a year later by the Texas Supreme Court.[233] This should not raise concerns about the feasibility of this Note's proposal, however, because the RCCEA would be distinct in three ways from its Texas relative. First, the RCCEs proposed here would be established by states under the express authorization of the federal government in the RCCEA, making it a federal, constitutional question instead of a state law question. The Texas Open Beaches Act was passed by the state without a federal statute authorizing or encouraging its promulgation.[234]

Second, states under the RCCEA would be permitted to develop and implement an RCCE scheme, but this would not be compulsory under the statute. States would have the flexibility to establish easements, and the critical-loss lines associated with those easements, based on what their legislatures deemed most rationally related to the state's interests. The passing of the Texas Open Beaches Act (OBA) in 1959 was largely a product of political pressure following the Texas Supreme Court decision in *Luttes v. State*.[235] This voluntary enactment of a state-level RCCE statute should limit potential public criticism and invalidation by the courts.

Lastly, the RCCEA and the subsequently established RCCEs will be substantively different from the OBA in Texas. The RCCEs will be limited in their scope—both in purpose and in practice. They will be limited to easements for necessary coastal renourishment and protection from sea level rise. The OBA in Texas acted primarily to create easements to maintain the continuous right for the public to access Gulf Coast beaches without "obstruction[s], barrier[s], or restraint[s]" interfering with the public easement.[236] The RCCEs will also be functionally optional—as stated above—where private property owners can choose to grant the easements, or deny it and take the calculated risk that sea levels will not rise to the critical loss line.

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233. *See* Severance v. Patterson, 566 F.3d 490, 493, 498–504 (5th Cir. 2009) (invalidating Texas' rolling easement doctrine, citing utter inconsistencies in the lower courts' support of the Texas rolling easement doctrine).

234. TEX. NAT. RES. CODE ANN. §§ 61.001–61.026 (West 1959).

235. *See* McLaughlin, *supra* note 29, at 370 (noting that the *Luttes* ruling "shocked the public and generated sufficient public political pressure" for the Texas state legislature to pass the Texas Open Beaches Act). *See generally* Luttes v. State, 324 S.W.2d 167 (Tex. 1958) (reversing the lower court's judgment on the proper establishment of the seashore line on private coastal property).

236. *See* TEX. NAT. RES. CODE ANN. § 61.013(a) (making it an offense against public policy to create obstructions or barriers); McLaughlin, *supra* note 29, at 370.

Enactment of the RCCEA and promulgation of state RCCE legislation would improve the United States' scheme for coastline protection. Such legislation would acknowledge and maintain the strong value allotted to private property rights while balancing the needs voiced by public opinion. With the federal authorization to enact the state programs, concerns with strict judicial review and scrutiny should be tamped down. The RCCEA would make strides in protecting not only the environment but also the land, structures, and infrastructure on US coastlines. The RCCEA also incorporates valuable compensation and distributional notice aspects of coastal protection programs in Israel, the United Kingdom, and China. This opt-in, market-driven approach gives private property owners the option to accept the RCCE or "bet" on the slowing and reversal of sea level rise. The scheme also benefits from federal, state, and local collaboration and buy-in. The RCCEA would also operate as cooperative federalism, where all levels of government are coordinating with the shared goal of protecting the people, infrastructure, and environment along the US coastline.

VII. CONCLUSION

What is the United States going to do to protect the coastal environment, infrastructure, and private property as sea levels continue to rise? State-driven approaches have had middling success without federal encouragement and oversight. Looking to transnational schemes and doctrines can inform a better approach to US coastline protection. Israel has a robust regulatory takings doctrine and illustrates the benefits of a proactive coastal protection scheme coupled with the potential to limit government liability for burdening properties with easements. The United Kingdom is steadfast in its protection of private property rights, a pillar of American law and policy. China's transparent and well-funded approach to coastal protection illustrates the benefits of a data-driven, motivated scheme. The US government can learn from these approaches and use them to create a better system in the United States.

One such improvement is the enactment of a federal Rolling Coastal Conversation Easement Act. Such a statute would authorize and encourage states to establish Rolling Coastal Conservation Easements on private property, allowing the government to renourish and protect the coastlines. These easements would create a proactive and prospective scheme that looks ahead to the catastrophic harms associated with sea level rise. Moreover, the compensation, notice, and voluntary nature of the easements would preserve the American value of private property rights. The straightforward, transparent purpose and practice of the easements reflects their limited but vital existence

for the public's benefit. The coasts of the United States are precious resources not to be squandered by ineffectiveness or inaction. This Note maintains this solution to coastline protection will help preserve persons, property, infrastructure, and limit inevitable degradation of the environment.

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