NOTES

Sink or Sell: Using Real Estate Purchase Options to Facilitate Coastal Retreat

Despite the political contention surrounding climate change, scientists almost universally agree that sea levels are rising and will continue to do so. In light of this inevitability, commentators and policymakers have begun to recognize that retreat—the withdrawal of people and development from coastal areas—will become necessary, at least in certain areas. Even so, many still question the viability of retreat given the exorbitant economic, political, and legal costs it generally faces. In particular, hardline opposition to retreat runs strong among many coastal landowners. This Note introduces a device for implementing retreat with the potential to overcome these obstacles: real estate options that do not vest until sea level rise materially harms coastal properties. By establishing a plan for retreat today but delaying withdrawal until necessary, such options can reduce the ultimate costs of retreat while still protecting coastal communities. Even more significantly, this approach invites landowners to bet on the likelihood of sea level rise, leveraging their current resistance so as to secure a promise to relocate if—and more likely when—retreat becomes the only available option.

INTRODUCTION

Though home to only 280 residents, Smith Island, Maryland, is of critical symbolic significance—at an elevation of only five feet, it represents a bellwether of sea level rise.[1] In the last century and a half, the Chesapeake Bay has already swallowed 3,300 acres of Smith Island, and the rest may disappear as soon as 2025.[2] In an effort to reverse this trend, the island has turned to jetties, bulkheads, and other coastal defenses,[3] and in 2012, the state of Maryland offered residents a buyout to relocate—an offer promptly rejected by most.[4] Meanwhile, the Chesapeake Bay has continued to rise, proving to be an unstoppable adversary.

Although in no way unique, the story of Smith Island encapsulates many of the themes and complexities surrounding sea level rise generally. Foremost among them is coastal landowners'

1. *See* Andrew Zaleski, *Smith Island Is Sinking into the Chesapeake Bay Thanks to Climate Change*, NEWSWEEK (Nov. 1, 2015, 3:56 PM), http://www.newsweek.com/2015/11/13/smith-island-sinking-chesapeake-bay-thanks-climate-change-389131.html [https://perma.cc/Q38C-GBEW] (describing Smith Island and its struggles in dealing with sea level rise).

2. Ben Giles, *Scientists Warn of Smith Island's Demise, Residents Are Skeptical*, BAY BEAT (Apr. 20, 2010), http://chesapeakebay.umd.edu/article/scientists-warn-smith-islands-demise-residents-are-skeptical [https://perma.cc/TE4W-6SFC].

3. Zaleski, *supra* note 1. At the end of 2017, construction of two new jetties began on Smith Island, a project backed by local, state, and federal funding. Kylie Winkler, *Army Corps Dredging and Jetty Project Begins on Smith Island*, WBOC 16 (Dec. 19, 2017, 6:18 PM), http://www.wboc.com/story/37103856/army-corps-dredging-and-jetty-project-begins-on-smith-island [https://perma.cc/CQU4-HSE3].

4. Zaleski, *supra* note 1.

refusal to capitulate,[5] an attitude that epitomizes not only general feelings about sea level rise in the United States,[6] but also the undeniable social[7] and economic[8] importance of our nation's coasts. Yet such resistance runs counter to scientific projections, which almost unanimously view sea level rise as inevitable.[9] Indeed, some experts now posit that relocating development from coastal areas—a strategy termed "retreat"—will become unavoidable as places like Smith Island face no other alternative.[10]

The incompatibility of these diametric positions—defiance on the one hand, and data suggesting the need to retreat on the other—illuminates the basic dilemma facing the future of American coasts.[11] This Note attempts to reconcile such tension by proposing the use of

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5. Countless examples of this attitude exist. For example, residents of the Wilmington, Delaware, neighborhood of Southbridge, which has faced persistent flooding problems, have declared that "retreat is not an option." Bruce Stutz, *Before the Storm: A Vulnerable Community Braces for the Impacts of Sea Level Rise*, YALE ENV'T 360 (Jan. 30, 2017), http://e360.yale.edu/features/a-vulnerable-community-braces-for-the-impacts-of-sea-level-rise [https://perma.cc/RQA4-L46P]. For a more metropolitan example, consider Miami. Despite being the "most threatened" city in the world, its beachfront development has continued unabated, largely due to high property values and the city's reliance on tourism. ORRIN H. PILKEY ET AL., RETREAT FROM A RISING SEA: HARD DECISIONS IN AN AGE OF CLIMATE CHANGE 31, 38 (2016).

6. *See, e.g.*, PILKEY ET AL., *supra* note 5, at 54–55 (describing New York City's defiant attitude toward sea level rise); *see also* Marc R. Poirier, *A Very Clear Blue Line: Behavioral Economics, Public Choice, Public Art and Sea Level Rise*, 16 SE. ENVTL. L.J. 83, 92–96 (2007) (diagnosing reasons for society's undervaluation of the risks of sea level rise).

7. *See* TIMOTHY BEATLEY ET AL., AN INTRODUCTION TO COASTAL ZONE MANAGEMENT 2 (2d ed. 2002) ("More than 180 million Americans visit the coast each year . . . ."); NAT'L OCEANIC & ATMOSPHERIC ADMIN., NATIONAL COASTAL POPULATION REPORT: POPULATION TRENDS FROM 1970 TO 2020, at 3 (2013), http://oceanservice.noaa.gov/facts/coastal-population-report.pdf [https://perma.cc/DD7E-HURA] (reporting on the high population density of U.S. coasts).

8. *See, e.g.*, U.S. GLOB. CHANGE RESEARCH PROGRAM, GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES 62 (2009), https://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf [https://perma.cc/J4B5-PZWD] [hereinafter CLIMATE CHANGE IMPACTS] (assessing the economic significance of coastal infrastructure in the United States).

9. *See, e.g.*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *Summary for Policymakers*, *in* CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 16 (Susan Solomon et al. eds., 2007) ("[S]ea level rise [will] continue for centuries due to the time scales associated with climate processes . . . ."); Anders Levermann et al., *The Multimillenial Sea-Level Commitment of Global Warming*, 110 PROC. NAT'L ACAD. SCI. 13745, 13748 (2013) ("On a 2,000-[year] time scale, the sea-level contribution will be largely independent of the exact warming path during the first century.").

10. *See generally* PILKEY ET AL., *supra* note 5 (presenting the case for retreat); *see also* J. Peter Byrne & Jessica Grannis, *Coastal Retreat Measures*, *in* THE LAW OF ADAPTATION TO CLIMATE CHANGE 267, 269 (Michael B. Gerrard & Katrina Fischer Kuh eds., 2012) (providing reasons to adopt retreat).

11. An excellent example of this dichotomy is North Carolina's House Bill 819, which "bans state and local agencies from basing . . . coastal policies on scientific models indicating an accelerating rise in sea level in favor of historical linear predictions." Nicole Papsco, *North Carolina Denies and Defies Science in House Bill 819*, COLUM. UNDERGRADUATE L. REV. (Mar. 21, 2016), http://blogs.cuit.columbia.edu/culr/2016/03/21/north-carolina-denies-and-defies-science-in-house-bill-819/ [https://perma.cc/38TE-KXPP]. The bill was apparently motivated by skepticism about such models and concerns about jeopardizing coastal development. *Id.*

purchase options—contracts that provide "the right to purchase something without the obligation to purchase it"[12]—as a strategy for accomplishing retreat. More specifically, it introduces what it calls "sea level purchase options" ("SLPOs")—real estate options that do not vest until sea level rise imposes tangible effects on a given property. Operationally, this Note asserts that nonprofit, conservation-focused organizations such as land trusts[13] should purchase SLPOs on threatened coastal properties, and when, but not until, sea level rise actually affects those properties—assessed objectively by measures such as tide line—land trusts would have the right to purchase the properties. After exercising SLPOs, land trusts would then maintain the land as open space, creating a coastal buffer against further sea level rise. On the other side of the transaction would be coastal landowners, who might agree to sell SLPOs either because they deny that sea levels are rising—and would thus receive consideration for selling an option they believe will never vest—or as a way to mitigate the risk of losing their land to sea level rise regardless.

While their primary purpose is to facilitate coastal retreat, the true value of SLPOs stems from their effect of delaying abandonment until necessary. This, in turn, has three critical consequences. First, because options impose no future obligations, they furnish flexibility in responding to sea level rise as it unfolds. Relatedly, landowners can continue to use coastal properties until retreat becomes imperative, but abandonment becomes an aspect of their expectations, discouraging wasteful development and increasing the chances of orderly, collaborative retreat in the future. Finally, and most compellingly, this arrangement has the potential to overcome landowner intransigence. By compensating landowners up front through an option payment and requiring in return only that they sell their land if sea level rise occurs, SLPOs leverage landowner skepticism so as to secure a promise to retreat when their position has become untenable.[14] For unyielding landowners, this is akin to gambling on the status quo—risking the sale

12. Federico Cheever & Jessica Owley, *Enhancing Conservation Options: An Argument for Statutory Recognition of Options to Purchase Conservation Easements (OPCES)*, 40 HARV. ENVTL. L. REV. 1, 11 (2016).

13. In proposing that land trusts lead SLPO programs, this Note reflects the larger movement of utilizing private governance—setting standards through private agreements and interactions—to address environmental problems in a way that is less politically controversial, and often more efficacious, than traditional regulation. *See generally* Michael P. Vandenbergh, *Private Environmental Governance*, 99 CORNELL L. REV. 129 (2013) (presenting private governance as a distinct and increasingly relevant approach to environmental issues).

14. "Climate derivatives," products that make climate outcomes tradable commodities, represent a similar means of "gambling" on climate change. For a discussion of climate derivatives, including "Climate Default Swaps," see generally Daniel Bloch et al., *Applying Climate Derivatives to Flood Risk Management*, WILMOTT MAG., Nov. 2011, at 88.

of their land on a bet that sea level rise will never occur. But selling SLPOs is also a way for landowners to hedge their bets; even if they lose and are forced to sell their land, they would receive a payout that sea level rise might otherwise foreclose.

In reality, SLPOs will not fundamentally change the end result for many coastal communities, where retreat will be necessary no matter the strategy taken. Instead, the novelty of SLPOs lies in their ability to begin crafting current expectations and behavior to account for that future.[15] In advocating for SLPOs as a tool for accomplishing this goal, this Note considers both the practical issues and normative dynamics associated with an SLPO program. Part I details the problem of sea level rise generally, looking at its wide-ranging effects as well as expectations for the future. Part II analyzes various responses to sea level rise and delves into the mitigation-adaptation dichotomy, contending that retreat, a form of adaptation, will become inevitable given current sea level rise projections. Part II also explores the difficulties with retreat and explains why existing mechanisms insufficiently address these difficulties. Part III then introduces SLPOs, considering design features to minimize short-term opposition to retreat while maximizing long-term protection of coastal communities. Finally, Part IV assesses the strengths and weaknesses of SLPOs from a public policy standpoint.

I. BACKGROUND: THE PROBLEM OF SEA LEVEL RISE

Climate change, of which sea level rise is a significant outgrowth, has become one of the most polarizing issues in today's political, legal, and scientific discourse. Discussion of climate-based issues often triggers intense feelings of either support or opposition. This Note attempts to overcome such discord by requiring recognition of only one basic fact: sea levels are indeed rising and will likely continue to do so. Beyond acceptance of this idea, this Note necessitates no particular view on climate change.

This Part frames the issue of sea level rise, evaluating why it has become, and will remain, so transformative. Section A presents an overview of current scientific projections, which provide a numerical baseline with which to understand the significance of sea level rise.

15. The use of real estate options as a retreat strategy has not been thoroughly addressed, although options to purchase conservation easements ("OPCEs") have been considered as a tool for adapting land conservation practices to climate change. *See generally* Cheever & Owley, *supra* note 12. However, this Note proposes something conceptually, contextually, and practically different: using options that are temporally linked to sea level rise to obtain interests—primarily fee simple—in coastal properties, with the ultimate goal of fostering retreat.

However, given the range of predictions and the locational variability expected, these projections also illustrate the lingering uncertainty surrounding sea level rise. Section B then analyzes the anticipated environmental, social, and economic effects of rising sea levels on both a global and local scale. These effects place the data in context and communicate why creative and flexible responses are necessary.

A. Bleak Prophecies: Sea Level Rise Projections

Despite the political contention surrounding climate change, the idea that sea levels are rising is largely uncontested among scientists.[16] The most commonly held view is that sea levels will rise three feet by 2100,[17] though projections can vary widely.[18] In fact, some studies with a greater focus on "tail risks"—low probability, high consequence events—provide far more alarming estimates.[19] Despite this variability, there is a more fundamental point worth noting: studies almost universally concur that some degree of sea level rise is inevitable, regardless of any success abating its underlying causes.[20] Consequently, any viable approach to dealing with sea level rise must first recognize it as a given for the foreseeable future.[21]

Complicating the issue further, however, is the fact that sea level rise is not geographically uniform. To the contrary, some areas are substantially more vulnerable than others[22] based on various

16. *See* John A. Church et al., *Sea Level Change*, *in* CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS 1137, 1140 (Thomas F. Stocker et al. eds., 2013) (finding sea level rise "*very likely*"); Benjamin P. Horton et al., *Expert Assessment of Sea-Level Rise by AD 2100 and AD 2300*, QUARTERNARY SCI. REVS., Jan. 15, 2014, at 1, 3–5 (aggregating models to find a consensus that sea levels will rise more than previously thought).

17. PILKEY ET AL., *supra* note 5, at 24; *see also* U.S. CLIMATE CHANGE SCI. PROGRAM, COASTAL SENSITIVITY TO SEA RISE: A FOCUS ON THE MID-ATLANTIC REGION 180 (2009), https://downloads.globalchange.gov/sap/sap4-1/sap4-1-final-report-all.pdf [https://perma.cc/U387-P4BE] [hereinafter COASTAL SENSITIVITY] (three feet); CLIMATE CHANGE IMPACTS, *supra* note 8, at 25 (three to four feet).

18. *Compare* Church et al., *supra* note 16, at 1140 (10.24–28.58 inches by 2100), *with* NAT'L OCEANIC ATMOSPHERIC ADMIN., TECHNICAL REP. NOS CO-OPS 083, GLOBAL AND REGIONAL SEA LEVEL RISE SCENARIOS FOR THE UNITED STATES, at vi (2017), https://tidesandcurrents.noaa.gov/publications/techrpt83_Global_and_Regional_SLR_Scenarios_for_the_US_final.pdf [https://perma.cc/LFU3-4LCB] (eight feet by 2100).

19. *See, e.g.*, Michael P. Vandenbergh, Brooke A. Ackerly & Fred E. Forster, *Micro-Offsets and Macro-Transformation: An Inconvenient View of Climate Change Justice*, 33 HARV. ENVTL. L. REV. 303, 317–18 (2009) (discussing one such study projecting a rise of thirty-two feet or more).

20. *See* sources cited *supra* note 9.

21. *See infra* Section II.A (considering the need for adaptive solutions based on this reality).

22. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 50–52 (Rajendra K. Pachauri et al. eds., 2007), https://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_full_report.pdf [https://perma.cc/29V9-WZAT] [hereinafter 2007 SYNTHESIS REPORT] (surveying impacts by region).

environmental characteristics.[23] For example, because of land subsidence and oceanic circulation patterns, Norfolk, Virginia, is expected to experience a rise of 5.5 feet by 2100, nearly double that of average global projections.[24] This lack of uniformity will translate into vastly different effects by location, and variations in impact will necessarily demand variations in response.[25]

B. The Effects of Sea Level Rise

Even if only the most conservative predictions materialize, the effects of higher sea levels will be consequential—while sea level rise of a few inches may not sound devastating, the data in context communicate a different reality. As an initial matter, for every vertical unit water rises, it expands horizontally by a factor upwards of one hundred.[26] Thus, for low-lying places such as Florida, which has been labeled the "canary in the mine shaft of sea-level rise,"[27] even incrementally higher sea levels may mean extensive inundation.[28] But still, if more alarming predictions play out, low-lying areas will not be alone in experiencing the effects of sea level rise.[29]

From an environmental standpoint, higher sea levels have both acute and gradual consequences. As sea levels rise, the number and intensity of adverse weather systems increase,[30] which in turn causes

23. *See* KARL F. NORDSTROM, BEACHES AND DUNES OF DEVELOPED COASTS 175 (2000) (discussing these variables). These characteristics include subsidence, tectonic forces, and ocean circulation. PILKEY ET AL., *supra* note 5, at 20–21.

24. PILKEY ET AL., *supra* note 5, at 13–14.

25. *See infra* Part II (analyzing responses to sea level rise and their varying applicability).

26. *See* STEPHEN P. LEATHERMAN & PATRICIA JONES KERSHAW, NAT'L RESEARCH COUNCIL, SEA LEVEL RISE AND COASTAL DISASTERS 3 (2002) ("[O]ne vertical unit of higher water level results in an average of 100 units of horizontal retreat . . . .").

27. BARRY G. RABE, STATEHOUSE AND GREENHOUSE: THE EMERGING POLITICS OF AMERICAN CLIMATE CHANGE POLICY 48 (2004).

28. *See* Benjamin H. Strauss, *Rapid Accumulation of Committed Sea-Level Rise from Global Warming*, 110 PROC. NAT'L ACAD. SCI. 13699, 13700 (2013) (projecting cities that will be threatened); Baden Copeland et al., *What Could Disappear*, N.Y. TIMES (Apr. 24, 2016), http://www.nytimes.com/interactive/2012/11/24/opinion/sunday/what-could-disappear.html?_r=0 [https://perma.cc/5XL6-5VY4] (providing a localized mapping tool illustrating effects at various projections).

29. *See* James G. Titus, *Does the U.S. Government Realize That the Sea Is Rising? How to Restructure Federal Programs so That Wetlands and Beaches Survive*, 30 GOLDEN GATE U. L. REV. 717, 725–732 (2000) (considering impacts at different elevations and distances from the shore).

30. John Walsh et al., *Our Changing Climate*, *in* CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT (J.M. Melillo et al. eds., 2014), http://s3.amazonaws.com/nca2014/low/NCA3_Full_Report_02_Our_Changing_Climate_LowRes.pdf?download=1 [https://perma.cc/J2SA-AGZG].

more frequent and intrusive storm surge[31] and flooding.[32] More discretely, sea level rise also accelerates erosion, which enables flooding and storms to push further inland.[33] As Smith Island so poignantly illustrates, this gradual invasion eventually results in outright submersion,[34] and along with it, the disappearance of barrier islands, coastal wetlands, and sand dunes—all of which themselves have critical ecological features that mitigate sea level rise.[35]

Socially, the adverse impacts of higher sea levels should be significant given the size of coastal populations. Incredibly, two-thirds of the world's largest cities occupy low-lying coastal areas at risk.[36] In the United States, 123.3 million people—thirty-nine percent of the nation's population—live in coastal counties,[37] and a rise of 3.2 feet would overrun the residences of approximately 3.7 million people.[38] Not only will sea level rise directly endanger these populations, but flooding and freshwater salinization will also have grave impacts on water resources and agriculture.[39] Accordingly, commentators expect substantial population displacement and resource allocation issues on both a national and international scale,[40] a prospect that has already led the Department of Defense to characterize sea level rise as a national security threat.[41]

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31. Storm surge is "the abnormal rise in seawater level during a storm, measured as the height of the water above the normal predicted astronomical tide." *What Is Storm Surge?*, NAT'L OCEANIC ATMOSPHERIC ADMIN., https://oceanservice.noaa.gov/facts/stormsurge-stormtide.html (last visited Oct. 14, 2017) [https://perma.cc/8LKV-YYGK].

32. *See* 2007 SYNTHESIS REPORT, *supra* note 22, at 48 ("By the 2080s, many millions more people than today are projected to experience floods every year due to sea level rise."). For example, one study estimates that, within the next thirty years, Miami Beach may be flooded 237 times per year. PILKEY ET AL., *supra* note 5, at 32.

33. *See* Stephen P. Leatherman, *Social and Economic Costs of Sea Level Rise*, *in* SEA LEVEL RISE: HISTORY AND CONSEQUENCES, INTERNATIONAL GEOPHYSICS SER. VOL. 75, ch. 8 at 192 (Bruce C. Douglas et al. eds., 2001) ("[T]he lateral beach erosion rate is always *two orders of magnitude or more than the rate of sea level rise!*").

34. *See* Giles, *supra* note 2 (reporting on the gradual disappearance of Smith Island).

35. *See* J. Peter Byrne, *The Cathedral Engulfed: Sea-Level Rise, Property Rights, and Time*, 73 LA. L. REV. 69, 77 (2012) (elaborating on this ecological feedback loop).

36. Nell Greenfieldboyce, *Study: 634 Million People at Risk from Rising Seas*, NAT'L PUB. RADIO (Mar. 28, 2007, 3:43 PM), http://www.npr.org/templates/story/story.php?storyId=9162438 [https://perma.cc/88LC-78F8].

37. BEATLEY ET AL., *supra* note 7, at 3.

38. Byrne, *supra* note 35, at 77.

39. *Id.* at 77–78; R. Gommes et al., *Direct and Indirect Effects of Sea-Level Rise*, FOOD & AGRIC. ORG. U.N., http://www.fao.org/nr/climpag/pub/eire0047_en.asp (last visited Jan. 12, 2018) [https://perma.cc/P546-QUBX].

40. *See* NORDSTROM, *supra* note 23, at 177 (forecasting resource competition as coastal residents relocate); PILKEY ET AL., *supra* note 5, at 130 (assessing the consequences of this issue).

41. PILKEY ET AL., *supra* note 5, at 119.

Sea level rise will undoubtedly have economic impacts as well. The United States has as much as $17 trillion worth of insurable property in ZIP codes vulnerable to storm surge on just the Gulf and Atlantic Coasts,[42] with the state of New York alone having $2.3 trillion worth of such property.[43] Obviously, this exposure will mean high property losses and will necessitate massive spending on disaster relief.[44] And given the value of coastal tourism, many local economies will suffer from disappearing beaches and other coastal attractions.[45] Much of the country's infrastructure is also at risk. Along the Gulf Coast, where almost thirty percent of roads and highways are less than four feet in elevation, 2,400 miles of major roads could be inundated in the next one hundred years.[46] Further, six of the country's ten busiest freight gateways occupy vulnerable areas, as does much of the nation's energy production apparatus.[47] As a result, estimates of the total losses are staggering—in the United States alone, a five-foot rise in sea levels could have a cumulative cost of $5 trillion, while a three-foot rise would cost $790 billion.[48] To put these figures in perspective, Hurricane Katrina, perhaps the most devastating storm in American history, caused $125 billion in losses.[49] Worldwide, assuming sea levels rise only fifteen inches, the costs of flooding in 136 of the world's largest coastal cities could cost $1 trillion *annually* by 2050.[50]

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42. Tim Doggett, *The Growing Value of U.S. Coastal Property at Risk*, AIR WORLDWIDE (Apr. 23, 2015), http://www.air-worldwide.com/Publications/AIR-Currents/2015/The-Growing-Value-of-U-S—Coastal-Property-at-Risk/ [https://perma.cc/P27D-H5Z8].

43. CLIMATE CHANGE IMPACTS, *supra* note 8, at 109. A comprehensive adaptation strategy for New York City could cost as much as $19.5 billion. PlaNYC, CITY OF N.Y., A STRONGER, MORE RESILIENT NEW YORK 401 (2013), http://s-media.nyc.gov/agencies/sirr/SIRR_singles_Lo_res.pdf.

44. *See* John R. Nolon, *Land Use and Climate Change Bubbles: Resilience, Retreat, and Due Diligence*, 39 WM. & MARY ENVTL. L. & POL'Y REV. 321, 332 (2015) (describing these costs).

45. Byrne, *supra* note 35, at 79.

46. CLIMATE CHANGE IMPACTS, *supra* note 8, at 62.

47. *Id.*

48. OFFICE OF ATMOSPHERIC PROGRAMS, U.S. EPA, EPA 430-R-15-001, CLIMATE CHANGE IN THE UNITED STATES: BENEFITS OF GLOBAL ACTION 40–41 (2015), https://www.epa.gov/sites/production/files/2015-06/documents/cirareport.pdf [https://perma.cc/79VR-2MN3]. Under the first scenario, the cost would fall to $810 billion if adaptation measures were implemented. *Id.*

49. *Billion-Dollar Weather and Climate Disasters: Table of Events*, NAT'L OCEANIC ATMOSPHERIC ADMIN., https://www.ncdc.noaa.gov/billions/events/US/1980-2017 (last visited Jan. 20, 2018) [https://perma.cc/MQ8P-3AM8] (click "Unadjusted" on right side of screen).

50. Stephane Hallegatte et al., *Future Flood Losses in Major Coastal Cities*, 3 NATURE CLIMATE CHANGE 802, 802 (2013). Deploying adaptation measures, however, could reduce this figure to about $60 billion annually. *Id.* By comparison, average global flood losses were estimated to be $6 billion in 2005. *Id.*

II. STEMMING THE TIDE: RESPONSES TO SEA LEVEL RISE

Due to the challenges identified in Part I, responding to sea level rise effectively and equitably will not be easy. Indeed, given the sheer magnitude of the problem, many different responses will be necessary. This Part surveys existing strategies, considering the strengths and weaknesses of each. First, Section A presents the policy debate over mitigation and adaptation, the two primary approaches to addressing climate change. Although traditionally viewed as mutually exclusive, scholars are increasingly understanding mitigation and adaptation to constitute equally important aspects of a comprehensive response. Section B then examines retreat—a form of adaptation—and concludes that, in some areas, it is the only cost-effective strategy in the long term.

A. To Cure or To Treat? Mitigation Versus Adaptation

Responses to climate change primarily fall into two broad categories: mitigation and adaptation. Whereas mitigation focuses on alleviating the root causes of climate change,[51] adaptation describes efforts "to adjust the built and social environment to minimize the negative outcomes of now-unavoidable climate change."[52] In effect, mitigation can be viewed as a cure, promoting strategies to stop sea levels from rising altogether, while adaptation is analogous to treatment, a way of remedying the symptoms and effects of higher sea levels.[53]

Although it has historically taken a backseat,[54] adaptation has recently emerged from the shadow of mitigation to become a valued policy approach,[55] a shift that has occurred for several reasons. Most

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51. Michael B. Gerrard, *Introduction and Overview*, *in* THE LAW OF ADAPTATION TO CLIMATE CHANGE, *supra* note 10, at 3, 3.

52. Elisabeth M. Hamin & Nicole Gurran, *Urban Form and Climate Change: Balancing Adaptation and Mitigation in the U.S. and Australia*, 33 HABITAT INT'L 238, 238 (2009); *see also* Gerrard, *supra* note 51, at 3 (defining adaptation as "efforts to moderate, cope with, and prepare for" climate change); J.B. Ruhl, *Climate Change Adaptation and the Structural Transformation of Environmental Law*, 40 ENVTL. L. 363, 366 n.2 (2010) (providing definitions of adaptation).

53. Gerrard, *supra* note 51, at 4.

54. For a discussion of the reasons for mitigation's traditional supremacy, see Ruhl, *supra* note 52, at 365–68.

55. *See generally* Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty Through a Learning Infrastructure*, 59 EMORY L.J. 1 (2009) (analyzing the promise of "adaptive governance"); Robin Kundis Craig, *"Stationarity Is Dead" — Long Live Transformation: Five Principles for Climate Change Adaptation Law*, 34 HARV. ENVTL. L. REV. 9 (2010) (advocating for "making adaptation part of a national climate change policy"); *see also* Ruhl, *supra* note 52, at 370–71 ("[A] consensus is building that mitigation needs adaptation . . . ."). For example, in the 2015 Paris Agreement, "there was a general movement to raise adaptation to the level of mitigation . . . ." Hari Osofsky et al., Dialogue, *The 2015 Paris Agreement on Climate Change:*

basically, as sea level rise has become a more immediate and unrelenting issue, scholars and policymakers alike have come to recognize that aligning our behavior with the reality of sea level rise—the basic premise of adaptation—is imperative.[56] Additionally, because adaptive measures are designed to evolve in step with the problems they address, they are viewed as a valuable way of confronting the uncertainties associated with sea level rise.[57] Such flexibility presents distinct advantages over the static and media-based approach of current environmental regulation,[58] and given its inherently local focus, adaptation circumvents much of the dysfunction concomitant with centralized mitigation efforts.[59] Although mitigation is undoubtedly a necessary response to sea level rise, it alone will not suffice. Instead, both mitigation and adaptation are "essential parts of a comprehensive climate change response strategy."[60]

Broadly speaking, adaptation exists in three forms. The first, "coastal defense" or "resistance," implicates measures such as armoring and beach renourishment aimed at staving off the sea through the use of either natural materials ("soft" armoring) or manmade seawalls and levees ("hard" armoring).[61] This has been a common response in Southern California, for example, where hard armoring covers one-third of the coast and soft armoring measures, such as vegetating dunes, have become increasingly popular.[62] A second variant of adaptation, termed "accommodation," involves refashioning coastal areas to better conform to higher sea levels through strategies such as placing structures on stilts or increasing setbacks.[63] Perhaps the most prominent example of accommodation is the Netherlands' system of floating buildings and infrastructure, part of the country's strategy of

Significance and Implications for the Future, 46 ENVTL. L. REP. NEWS & ANALYSIS 10267, 10269 (2016) (quoting statement by Lisa Benjamin, assistant professor at The College of the Bahamas).

56. *See* sources cited *supra* note 55.

57. Robert L. Fischman & Jillian R. Rountree, *Adaptive Management*, *in* THE LAW OF ADAPTATION TO CLIMATE CHANGE, *supra* note 10, at 19, 19.

58. *See* Matthew D. Zinn, *Adapting to Climate Change: Environmental Law in a Warmer World*, 34 ECOLOGY L.Q. 61, 83 (2007) ("[Environmental] law is compartmentalized into isolated regulatory programs based on individual media, resources, or categories of pollutants . . . . These divisions are, to say the least, in tension with the integrated nature of environmental problems.").

59. *See* Nolon, *supra* note 44, at 362 (highlighting the benefits of localized adaptation in contrast to strategies necessitating "scientific consensus and appeals for federal . . . intervention").

60. CLIMATE CHANGE IMPACTS, *supra* note 8, at 11.

61. Byrne, *supra* note 35, at 87.

62. MOLLY LOUGHNEY MELIUS & MARGARET R. CALDWELL, STANFORD LAW SCH. ENV'T & NAT. RES. LAW & POLICY PROGRAM, 2015 CALIFORNIA COASTAL ARMORING REPORT: MANAGING COASTAL ARMORING AND CLIMATE CHANGE ADAPTATION IN THE 21ST CENTURY 3, 12 (2015), http://law.stanford.edu/wp-content/uploads/2015/07/CalCoastArmor-FULL-REPORT-6.17.15.pdf [https://perma.cc/75GP-63Y7].

63. Byrne, *supra* note 35, at 85.

"living with water."[64] The final form of adaptation, and the one on which this Note will focus, is "retreat."[65] As its name indicates, retreat involves moving development away from coastal areas, "reflect[ing] a decision that maintaining the status quo *in situ* is not feasible or practical . . . ."[66]

B. The Inescapability of Retreat

To be sure, all three forms of adaptation have situational utility, with the most advantageous approach depending on the circumstances. For example, geography is often a critical factor—whereas retreat is generally viewed as apt for less developed areas with nearby affordable land,[67] resistance and accommodation may be more desirable along urban and heavily developed coasts.[68] Physical geography can be consequential as well, such as in South Florida, where armoring is impractical due to the porous limestone on which the region sits.[69] These and other place-specific considerations, including the cultural importance of coastal areas and a region's wealth and politics,[70] affect the viability of each form of adaptation, leaving some areas able to utilize resistance or accommodation measures and others more likely to retreat.[71]

Yet even where these factors favor resistance and accommodation, some degree of retreat may still be necessary as sea

64. *See* PILKEY ET AL., *supra* note 5, at 7–8 (describing and assessing this strategy).

65. More precisely, "retreat" as used in this Note generally refers to "strategic" retreat, which "plans for the eventual relocation of structures inland, as properties become threatened . . . ." JESSICA GRANNIS, GEORGETOWN CLIMATE CTR., ADAPTATION TOOL KIT: SEA-LEVEL RISE AND COASTAL LAND USE 14 (2011), http://www.georgetownclimate.org/files/report/Adaptation_Tool_Kit_SLR.pdf [https://perma.cc/V8G3-VGSY]. This is in contrast to postimpact retreat. *See infra* notes 245–246 and accompanying text (comparing these two forms of retreat).

66. Ruhl, *supra* note 52, at 388–89.

67. NORDSTROM, *supra* note 23, at 245–46.

68. Henry Bokuniewicz, *Tailoring Local Responses to Rising Sea Level: A Suggestion for Long Island, NY*, STONY BROOK U. SCH. MARINE & ATMOSPHERIC SCI. (Jan. 28, 2015), https://www.somas.stonybrook.edu/institutes/coastal-ocean-action-strategies-institute/tailoring-local-responses-to-rising-sea-level-a-suggestion-for-long-island-ny/ [https://perma.cc/57M2-DXAN]. One commentator has suggested that retreat is not viewed as a serious strategy in developed areas. NORDSTROM, *supra* note 23, at 246.

69. Greg Allen, *Florida Faces Drastic Change from Sea Level Rise*, NAT'L PUB. RADIO (Dec. 11, 2009, 12:01 AM), http://www.npr.org/templates/story/story.php?storyId=120498442 [https://perma.cc/RE93-33HW].

70. *See* PILKEY ET AL., *supra* note 5, at 51–63 (contrasting New York and the Netherlands based on these factors).

71. PILKEY ET AL., *supra* note 5, at 51–63, 91 (comparing the likelihood of retreat in various areas). For example, although the Netherlands has had success in the intensive use of dikes and storm-surge barriers, this approach cannot be practically transplanted to the United States on a large scale given the length of the American coastline. *Id.* at 63. As a general matter, then, the United States will likely be forced to rely on retreat to a greater extent than the Netherlands.

levels continue to rise. The long view reveals an inexorable problem with resistance and accommodation—both irrationally encourage coastal communities to remain in areas under siege. Continued occupation not only raises the stakes of natural disasters[72] but also renders resistance and accommodation largely cost ineffective in the long run. While resistance measures have been popular and temporarily successful on occasion,[73] they are financially and environmentally costly and therefore incompatible with widespread, prolonged use.[74] And while accommodation generally has low financial and administrative costs, commentators have likewise questioned its long-term viability, as attempting to reconcile development with the ever-intensifying effects of sea level rise becomes more ineffective the more dramatic those effects become.[75] In short, both resistance and accommodation serve only to "postpone[ ] the inevitable."[76]

Retreat, on the other hand, avoids these shortfalls. For one thing, it may be the most cost-effective approach in the long run, as relocation allows communities to avoid the future costs of defending and rebuilding development in vulnerable areas.[77] Over time, this represents a less expensive way of protecting investment than can be accomplished with coastal defenses, which require maintenance and continued expansion as sea levels rise.[78] Moreover, by liberating coastal land from human occupation, retreat allows for the restoration of dune systems and wetlands that provide environmental benefits such as flood

72. GRANNIS, *supra* note 65, at 6.

73. *See, e.g.*, MELIUS & CALDWELL, *supra* note 62 (reporting on armoring along California's coasts).

74. *See* BEATLEY ET AL., *supra* note 7, at 293 (characterizing resistance as "largely futile and financially and ecologically costly"); Byrne, *supra* note 35, at 86–96 (examining the limitations of armoring).

75. *See* Byrne & Grannis, *supra* note 10, at 269 ("[I]t may not be economically and technically feasible to continue to build structures higher as sea levels rise.").

76. Celeste Pagano, *Where's the Beach? Coastal Access in the Age of Rising Tides*, 42 SW. L. REV. 1, 40 (2012).

77. *See* NORDSTROM, *supra* note 23, at 180 (stating that retreat's costs may be lower than the costs of coastal protection); Martin M. Randall, *Coastal Development Run Amuck: A Policy of Retreat May Be the Only Hope*, 18 J. ENVTL. L. & LITIG. 145, 181 (2003) ("[O]nce humans and structures are removed . . . so too are the costs of maintaining infrastructure, providing disaster relief, and implementing protective measures . . . .").

78. *See* Byrne & Grannis, *supra* note 10, at 269 ("Armoring is costly to build and maintain . . . . It may become cost prohibitive to build ever-higher protective structures as sea levels continue to rise."); Craig E. Landry et al., *An Economic Evaluation of Beach Erosion Management Alternatives*, 18 MARINE RESOURCE ECON. 105, 121 (2003) (finding that, as management costs increase, retreat becomes a preferable strategy).

protection,[79] while also preserving beaches for future generations.[80] Lastly, and most importantly, retreat reduces human exposure to natural disasters and flooding.[81] Granted, relocation does not guarantee total security—hurricanes, for example, can impact areas hundreds of miles inland—but moving even small distances from the shore yields significant returns in terms of human lives and safety.[82]

Policymakers have increasingly turned to retreat in light of these advantages.[83] One compelling example is Sidney, New York, a town that chose to move from its original location along the Susquehanna River after being ravaged by two catastrophic floods.[84] Although Sidney tried to rebuild following the first flood in 2006, a tropical storm struck just five years later, prompting community leaders and residents to realize "it would not be sustainable for Sidney's economy to rebuild in the vulnerable flood prone area."[85] So after receiving state funding, the town decided to relocate to higher ground.[86] Another example is South Carolina, whose legislature has pursued a policy of retreat after finding it was in "both the public and private interests" to do so.[87] In nations around the world, including Great Britain, communities have likewise begun withdrawing from certain areas because of the "politically unacceptable" costs of waging continued resistance.[88] As this direction indicates, many have come to believe that "retreat may be the only viable option."[89]

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79. *See* BEATLEY ET AL., *supra* note 7, at 292–93 (describing the ecological benefits of retreat).

80. *See* PILKEY ET AL., *supra* note 5, at 4 ("Preserving beaches for future generations is a compelling reason to retreat . . . ."). In contrast, hard armoring triggers an eventual loss of beach. *Id.* at 8.

81. Randall, *supra* note 77, at 181.

82. *See* Byrne & Grannis, *supra* note 10, at 269 ("Retreat strategies limit the number of people . . . that are exposed when storms hit."); Randall, *supra* note 77, at 181 ("[R]etreat is more effective in reducing the scope of disasters because it limits the exposure of humans to risk.").

83. *See, e.g.*, Erika Bolstad, *Once Unthinkable, 'Planned Retreat' Enters the Climate Dialogue*, E&E NEWS: CLIMATE WIRE (Jan. 31, 2017), https://www.eenews.net/climatewire/2017/01/31/stories/1060049240 [https://perma.cc/J5JP-KWU2] (describing retreat as an increasingly pertinent strategy among policymakers).

84. Nolon, *supra* note 44, at 337–38. A similar example is Shishmaref, Alaska, where citizens overwhelmingly voted to relocate after repeated storm surge damage. *Id.* at 337 n.85.

85. *Id.* at 338–39.

86. *Id.* In its wake, Sidney left behind deserted neighborhoods and abandoned buildings that will ultimately be demolished. *Id.* at 339.

87. John R. Nolon, *Sea-Level Rise and the Legacy of* Lucas*: Planning for an Uncertain Future*, 66 PLAN. & ENVTL. L. 4, 5 (2014) (quoting S.C. CODE ANN. § 48-39-250(4) (2008)).

88. Elisabeth Rosenthal, *As the Climate Changes, Bits of England's Coast Crumble*, N.Y. TIMES (May 4, 2007), http://www.nytimes.com/2007/05/04/world/europe/04erode.html [https://perma.cc/5K6Z-VSGL].

89. Byrne & Grannis, *supra* note 10, at 269; *see also* BEATLEY ET AL., *supra* note 7, at 292–93 ("[S]trategic retreat seems the most sensible and cost-effective strategy."); PILKEY ET AL., *supra* note 5.

Communities looking to implement retreat can do so in a number of ways. Perhaps the most straightforward is the adoption of land use controls such as development moratoria and rebuilding restrictions, which build retreat into local land use schemes.[90] Alternatively, governments can relocate development through acquisition programs. Numerous states and the federal government already conduct voluntary buyouts of vulnerable properties, with eminent domain existing as an alternative.[91] In some states, governments can also obtain non-fee property interests such as "rolling easements," which permit upland development but restrict future use of properties as shorelines recede.[92] Similarly, governments and land trusts can acquire coastal "conservation easements," which typically restrict development for perpetuity.[93] Another market-based alternative is for governments to provide coastal landowners with transferrable development rights, which entitle landowners to swap the right to develop coastal properties for the right to develop elsewhere.[94] Finally, tax incentives of various kinds can be used to steer development away from coasts.[95]

Despite some promise, none of these approaches are unassailable. In particular, public retreat programs face substantial political and legal obstacles. Generally, retreat is unpalatable to many influential coastal interests, such as real estate developers, flood insurers, and coastal landowners.[96] Given the political strength of these constituents, local governments—especially those that profit from high property taxes and tourism—are often reticent to pursue a policy of retreat.[97] Regulatory retreat measures are also subject to the Takings

90. *See* Byrne & Grannis, *supra* note 10, at 271–74 (outlining land use retreat measures). Although land use decisions primarily occur at the local level, some federal statutes also offer frameworks for retreat, including the Coastal Zone Management Act, which provides funding to states with coastal land use plans. *See* 16 U.S.C. § 1456(b) (2012). For a discussion of the use of federal statutes for retreat, see Byrne & Grannis, *supra* note 10, at 289–92.

91. *See* Byrne & Grannis, *supra* note 10, at 283–84, 286 (describing the use of acquisition programs and eminent domain as retreat strategies).

92. Margaret E. Peloso & Margaret R. Caldwell, *Dynamic Property Rights: The Public Trust Doctrine and Takings in a Changing Climate*, 30 STAN. ENVTL. L.J. 51, 56–62 (2011).

93. *See* John R. Nolon, *Regulatory Takings and Property Rights Confront Sea Level Rise: How Do They Roll?*, 21 WIDENER L.J. 735, 764–66 (2012) (discussing conservation easements as a response to sea level rise). Land trusts are discussed at length in Section III.B below.

94. *See* Nicholas R. Williams, *Coastal TDRs and Takings in a Changing Climate*, 46 URB. LAW. 139, 153–55 (2014) (describing the mechanics of transferable development rights).

95. *See* Byrne & Grannis, *supra* note 10, at 289 (considering the utility of tax incentives, including preferential assessments, tax credits and deductions, and density bonuses).

96. *See id.* at 270 (outlining the politics of retreat).

97. *See id.* (describing this unwillingness); *see also* Daniel D. Barnhizer, *Givings Recapture: Funding Public Acquisition of Private Property Interests on the Coasts*, 27 HARV. ENVTL. L. REV. 295, 348–50 (2003) (assessing the political strength of floodplain landowners).

Clause,[98] which operates to limit government action that "goes too far" in regulating property.[99] The Supreme Court has fleshed out this standard principally through the *Penn Central* three-factor balancing test, which weighs a regulation's character, economic impact, and interference with investment-backed expectations.[100] Moreover, regulations rendering a property economically valueless are per se takings under *Lucas v. South Carolina Coastal Council*,[101] a case that, coincidentally enough, found a form of retreat legislation to violate the Takings Clause.[102] Under both *Lucas* and *Penn Central*, stringent retreat regulations face the prospect of takings liability,[103] raising the monetary and political costs of public retreat programs.[104]

Further, retreat often faces such high economic costs as to be disqualifying.[105] At present, the often exorbitant values of coastal properties undermine the feasibility of public acquisition, whether through voluntary buyouts or eminent domain.[106] More subtly, policies such as the federal government's subsidization of flood insurance also directly frustrate retreat by rendering coastal development cheaper than it otherwise would be.[107] Mandatory retreat programs also raise environmental justice concerns. Because lower income areas often wield less political influence and are unable to afford coastal defenses, they are disproportionately targets of retreat programs.[108] For example, the

98. *See* Byrne & Grannis, *supra* note 10, at 270 (outlining the takings obstacle to retreat).

99. Pa. Coal Co. v. Mahon, 260 U.S. 393, 415 (1922).

100. Penn Cent. Transp. Co. v. New York City, 438 U.S. 104, 124 (1978).

101. 505 U.S. 1003, 1019 (1992).

102. *See* Ellen P. Hawes, *Coastal Natural Hazards Mitigation: The Erosion of Regulatory Retreat in South Carolina*, 7 S.C. ENVTL. L.J. 55, 65–67 (1998) (describing the facts of *Lucas* as well as its inhibitive impact on subsequent retreat policies in South Carolina).

103. *See* Byrne, *supra* note 35, at 73 ("Retreat . . . raises the most troubling takings issues."); Byrne & Grannis, *supra* note 10, at 270 ("Regulators will need to carefully craft retreat laws to ensure that they do not completely wipe out all economic value of regulated lands . . . ."); Nolon, *supra* note 87, at 5–6 ("Where local governments severely regulate coastal development, . . . they face a formidable obstacle in the total-taking doctrine of the *Lucas* case . . . . Do [regulations that prohibit building on coastal lands] not, on their face, destroy all economic value, thereby constituting a total taking under *Lucas* . . . ?").

104. See *infra* notes 211–214 and accompanying text (analyzing the costs associated with takings claims).

105. *See* Byrne & Grannis, *supra* note 10, at 270 (highlighting economic obstacles to retreat).

106. *See* Doggett, *supra* note 42 (estimating the value of property located in vulnerable areas).

107. *See* Jennifer Wriggins, *Flood Money: The Challenge of U.S. Flood Insurance Reform in a Warming World*, 119 PA. ST. L. REV. 361, 423–25 (2014) (calling for the end of flood insurance subsidies because "they create illogical incentives, particularly given climate change").

108. Byrne & Grannis, *supra* note 10, at 270; *see also* NAT'L WILDLIFE FED'N, HIGHER GROUND: A REPORT ON VOLUNTARY BUYOUTS IN THE NATION'S FLOODPLAINS 34 (1998), https://www.nwf.org/~/media/PDFs/Water/199807_HigherGround_Report.ashx [https://perma.cc/Z6WK-MECB] ("[S]ome local officials may support a community buyout plan as a way to drive low-income residents out of the community.").

federal government recently announced a program under which all residents of Isle de Jean Charles, a low-income community in southern Louisiana, would be relocated, an episode emblematic of growing concerns about the equity of retreat.[109]

III. UPPING THE ANTE: PURCHASE OPTIONS AS A TOOL FOR RETREAT

An ideal strategy for retreat, or at least one that overcomes many of the current challenges faced by retreat measures, would have several features: flexibility to address the unpredictability of sea level rise, relatively modest costs, and the capacity to overcome legal uncertainty and political opposition.[110] Critically, one way of achieving these goals is to exploit the delayed effects of sea level rise by putting a plan for retreat in place today but delaying abandonment until necessary. This timing approach is akin to so-called "sunrise" policies, wherein a strategy is announced today but does not take effect until the future.[111] Such policies are often viewed as an efficient method for implementing adaptation. For example, one commentator has declared that sunrise policies "have the potential to provide effective environmental and social protections, to minimize harm to property owners, to preserve the public fisc, and to shape legal expectations appropriately."[112] Others have pointed out that such policies reduce political opposition, provide regulated parties with the opportunity to recoup investments, and maintain regulatory flexibility moving forward.[113] This Note proposes to implement a type of sunrise policy it calls the sea level purchase option, or SLPO—a real estate option that does not vest until sea level rise materially affects the property at issue.

The typical transaction envisioned by this Note would involve a land trust or similar entity purchasing an SLPO on a threatened coastal property. Once sea level rise has certain effects on that property, the SLPO would then vest, providing the land trust with the right to purchase the property for a specified price. Based on this structure,

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109. Coral Davenport & Campbell Robertson, *Resettling the First American 'Climate Refugees*,' N.Y. TIMES (May 3, 2016), http://www.nytimes.com/2016/05/03/us/resettling-the-first-american-climate-refugees.html?_r=1 [https://perma.cc/NMA2-MN2L].

110. Another desired characteristic may be the ability to strategically target high-risk areas. *See infra* note 234 and accompanying text (discussing strategic targeting).

111. *See* AKHIL REED AMAR, AMERICA'S UNWRITTEN CONSTITUTION 474–77 (2012) (analyzing constitutional sunrise rules). In the adaptation context, examples of this timing concept include acquisition of future interests and rolling easements. *See* Byrne, *supra* note 35, at 104–18 (proposing the use of these and similar approaches in implementing adaptation).

112. Byrne, *supra* note 35, at 72–73.

113. Christopher Serkin & Michael P. Vandenbergh, *Prospective Grandfathering: Anticipating the Energy Transition Problem*, MINN. L. REV. (forthcoming 2018) (manuscript at 37, 44–45), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3024197 [https://perma.cc/JP7M-6XFD].

SLPOs offer a way of initiating the process of retreat while delaying actual withdrawal and its attendant political and economic costs. Similarly, because SLPOs do not require a substantial commitment of resources until exercised, they offer flexibility in reacting to sea level rise when and where it occurs. Simultaneously, by providing front-end and back-end payments to landowners, SLPO programs can attain greater buy-in to retreat by allowing landowners to bet against the likelihood of sea level rise while still potentially compensating them should they lose. Consequently, SLPOs provide a means of realizing the three goals—flexibility, cost-effectiveness, and legal and political viability—discussed above.

Even with these benefits, this Note does not claim that SLPOs are a universal cure-all. Instead, they are a tool worthy of inclusion in the existing repertoire of adaption and mitigation strategies.[114] Relatedly, rather than attempting to present a one-size-fits-all strategy, this Note provides a matrix of the considerations relevant to designing SLPOs as a supplement to other regulatory and private retreat measures. Necessarily, the specifics of each transaction will vary depending on the parties and negotiations involved and the property in question.[115] Therefore, this Part takes an in-depth look at structuring SLPOs generally to maximize their retreat-based potential, starting with an overview of the basic mechanics of purchase options in Section A. Section B then contends that land trusts should lead the way in acquiring SLPOs because of their experience in real estate acquisitions and conservation. Section C outlines the specific design features of SLPOs, discussing the role of the option payment and how options can be temporally linked to sea level rise without suffering legal invalidation. Lastly, Section D considers the process of exercising SLPOs as well as the use of coastal properties once acquired.

A. Purchase Options: The Basics

An option is defined as "an offer to enter a particular contract to sell which has been made irrevocable."[116] Essentially, then, options

114. Indeed, given the expected costs of sea level rise, adaptation will likely necessitate the use of many different strategies by diverse actors, both public and private. Thus, this Note offers SLPOs as an effective complement to or replacement for other adaptation measures. *See supra* Section IV.C (describing the way in which SLPOs can efficiently supplement government action).

115. For example, although this Note focuses on options to purchase fee simple, SLPOs could be used to purchase any property interest, such as conservation easements. For a thorough treatment of OPCEs, see generally Cheever & Owley, *supra* note 12.

116. Ronald Benton Brown, *An Examination of Real Estate Purchase Options*, 12 NOVA L. REV. 147, 148 (1987); *see also* 1 RICHARD A. LORD, WILLISTON ON CONTRACTS § 5:16 (4th ed. 1990) (defining an option as a "unilateral contract which binds the optionee to do nothing, but grants

involve two separate but related contracts—the first (the "option contract") obligating a landowner (the "optionor") to hold open an offer to enter into a second purchase contract with the option holder (the "optionee").[117] The optionee provides consideration in the form of an option payment, and in return receives the right to exercise the option for a certain period.[118] Once that period expires, the optionee can no longer exercise the option and is not entitled to a return of the consideration.[119] But if the optionee exercises the option within the given period, the option "ripen[s] into a contract for . . . purchase," the terms of which are typically laid out in the original option contract.[120]

Purchase options have been used in many types of transactions and for varying purposes. Though options are perhaps most prevalent in the financial context as a derivative security instrument,[121] real estate options—the focus of this Note—are also commonplace. For instance, developers utilize options to preserve the opportunity to purchase property at a given price while they assemble other land, study the property further, or obtain financing.[122] Land trusts use options for similar purposes in achieving conservation goals.[123] In addition, investors often acquire options as a way to bet on an upswing in the real estate market,[124] leading to the characterization of options as akin to gambling.[125] Thus, options are a basic yet critical means of building flexibility into real estate transactions.

B. The Options for Optionee

In a sense, one major goal of SLPOs is to facilitate the conservation of coastal areas—after all, retreat necessarily entails the removal of people and development from coastal properties and a return

him or her the right to accept or reject the offer in accordance with its terms within the time and in the manner specified in the option").

117. Brown, *supra* note 116, at 148; *see also* Gregory S. Gosfield, *A Primer on Real Estate Options*, 35 REAL PROP. PROB. & TR. J. 129, 137–38 (2000) (listing the required terms of option contracts).

118. Brown, *supra* note 116, at 149–50.

119. *Id.* at 150.

120. *Id.*

121. *See* Avery Wiener Katz, *The Option Element in Contracting*, 90 VA. L. REV. 2187, 2217 (2004) (describing financial options).

122. Brown, *supra* note 116, at 165–66.

123. Cheever & Owley, *supra* note 12, at 5.

124. Brown, *supra* note 116, at 167.

125. *See* Katz, *supra* note 121, at 2217 ("[P]arties often engage in speculative exchange when they have different beliefs about what the future will hold. . . . [O]ptions . . . can then be a way of betting on the future and hedging against the risk of other events."); *cf.* Baker v. Jellibeans, Inc., 314 S.E.2d 874, 877 (Ga. 1984) (declining to hold an option illegal as a gambling contract).

of those properties to their natural state.[126] For that reason, the most intuitive candidates for optionees are conservation land trusts—"nonprofit conservation organization[s] under 26 [U.S.C. § 501(c)(3) (2012)] that, as all or a substantial part of [their] mission, actively work[ ] to conserve land by undertaking or assisting in fee-land or conservation-easement acquisition through donation or purchase, or by stewardship of such land or easements."[127]

Though one could imagine governments or other private entities taking the lead, this Note contends that land trusts offer the most promise as optionees largely because of this foundational mission. For one thing, this mission may foster increased participation, as landowners would likely harbor suspicion about the motives of other private entities attempting to acquire options on their properties. More importantly, this focus on conservation suggests that once land trusts acquire coastal properties, they would maintain the land for conservation-friendly—as opposed to profit-motivated—purposes.[128] This is consonant with the premise of retreat and thus the purpose of SLPOs.

There are also a number of practical benefits to having land trusts act as optionees. Because they exist all over the country and already protect millions of acres in coastal states, land trusts are well-positioned to take the lead in acquiring SLPOs.[129] Although a wide-scale SLPO program may exceed the current operations of some smaller, more donation-focused land trusts, acquiring and exercising SLPOs and managing coastal properties should be well within the wheelhouse of most land trusts and consistent with their real estate experience.[130] This expertise offers efficiency advantages absent in

126. *See infra* note 204 and accompanying text.

127. *Trust*, BLACK'S LAW DICTIONARY (10th ed. 2014); *see also* JAMES G. TITUS, EPA, ROLLING EASEMENTS 56, 94 (2011), https://www.epa.gov/sites/production/files/documents/rollingeasementsprimer.pdf [https://perma.cc/N9AU-ADX7] (noting the legal requirements entities must meet to hold conservation easements).

128. Concerning for-profit entities, it is not all that clear why purchasing SLPOs on soon-to-be worthless properties would even be attractive. But assuming such entities would be interested, they would presumably look to squeeze properties of remaining value by, for example, flipping them or renting them out. To the extent such profit-seeking encourages the continued occupation of coastal properties, it would undermine the point of retreat. *See infra* notes 204–207 and accompanying text (discussing the importance of conserving properties after SLPOs are exercised).

129. *See 2015 National Land Trust Census Map*, LAND TR. ALL., http://www.landtrustalliance.org/census-map/ (last visited Oct. 11, 2017) [https://perma.cc/P4UH-8CUV] (stating that there are 1,363 active land trusts in the United States and providing figures on protected acreage by state).

130. *See* Zachary Bray, *Reconciling Development and Natural Beauty: The Promise and Dilemma of Conservation Easements*, 34 HARV. ENVTL. L. REV. 119, 124–25, 144, 160–61 (2010) (finding via survey that most interests owned by land trusts in Massachusetts are donated conservation easements, but also intimating that a greater focus on fee simple acquisitions by land

public acquisition programs, which often couple administrative inefficiency with ineffective stewardship.[131] Furthermore, as private entities, land trusts avoid the political and legal issues that may plague a public SLPO program. Not only are land trusts less vulnerable to political pressure than public agencies—meaning they can exercise more independent judgment on controversial issues such as retreat[132]—their actions are also beyond the reach of takings claims.[133] Relatedly, they provoke relatively little political angst among conservatives and liberals alike and offer a palatable alternative to regulation for property rights advocates.[134]

Certainly, the most glaring issue with this proposal is whether land trusts have the funding necessary to purchase and exercise SLPOs on a wide enough scale to meaningfully accomplish retreat. While financial limitations may certainly impede the ability of land trusts to acquire SLPOs on every endangered property, the economics are not as obstructive as they might first appear. First, the costs of SLPOs will be relatively modest, as discussed below,[135] and most land trusts should be able to finance substantial SLPO programs given their often

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trusts would be not only possible, but desirable); Cheever & Owley, *supra* note 12, at 2–3, 12–13 (describing the basic operations of land trusts, including their experience with real estate options); *Why Conserve Land—Protected Forever*, LAND TR. ALL., https://www.landtrustalliance.org/why-conserve-land/how-it-works/protected-forever (last visited Jan. 19, 2018) [https://perma.cc/DD8X-A7E7] (outlining the typical responsibilities of land trusts). Moreover, commentators have suggested that land trusts are well-equipped to undertake "land banking"—the acquisition of open space for the purpose of preserving it—which would entail many of the same financial and practical features as SLPO programs. *See* JULIAN CONRAD JUERGENSMEYER & THOMAS E. ROBERTS, LAND USE PLANNING AND DEVELOPMENT REGULATION LAW § 13:13 (2d ed. 2007) (discussing land trust involvement in the land banking of agricultural land and citing sources).

131. *See* Becky Hayat & Robert Moore, *Addressing Affordability and Long-Term Resiliency Through the National Flood Insurance Program*, 45 ENVTL. L. REP. 10338, 10343 (2015) (describing the process of government buyouts as "agonizingly slow"); Dana Joel Gattuso, *Conservation Easements: The Good, the Bad, and the Ugly*, NAT'L CTR. FOR PUB. POL'Y RES. (May 2008), http://www.nationalcenter.org/NPA569.html [https://perma.cc/8UWS-KN2P] (highlighting studies indicating that land trusts are more effective conservation stewards than governments).

132. *See* James G. Titus, *Greenhouse Effect and Coastal Wetland Policy: How Americans Could Abandon an Area the Size of Massachusetts at Minimum Cost*, 15 ENVTL. MGMT. 39, 54–56 (1991) (preferring approaches that remove retreat decisions from the control of politicians).

133. *See* Joshua P. Welsh, Comment, *Firm Ground for Wetland Protection: Using the Treaty Power to Strengthen Conservation Easements*, 36 STETSON L. REV. 207, 213 (2006) ("[C]onservation easements are immune to claims of regulatory takings because they arise out of a voluntary conveyance by a private landowner.").

134. *Cf.* Federico Cheever, *Property Rights and the Maintenance of Wildlife Habitat: The Case for Conservation Land Transactions*, 38 IDAHO L. REV. 431, 451 (2002) (describing public uneasiness with governments "owning" nature); Jeffrey Tapick, Note, *Threats to the Continued Existence of Conservation Easements*, 27 COLUM. J. ENVTL. L. 257, 260 n.5 (2002) ("[C]onservation easements have a broader ideological appeal than other regulatory impediments to land development, particularly among proponents of private property rights . . . .").

135. *See infra* Sections III.C.1 and III.D (examining the potential costs of SLPOs); *see also infra* note 188 (discussing the per-property costs of SLPOs).

surprisingly large resource bases. In fact, as of 2015, land trusts in the United States had a reported $2.18 billion in endowments and dedicated funding.[136] This figure reflects a recent explosion in funding—between 2005 and 2010, land trusts nearly tripled their operating endowments[137]—due in part to the use of novel and sophisticated financing mechanisms such as the issuance of securities.[138] If this trend continues, land trusts' ability to purchase and exercise SLPOs should only increase with time.[139] Further, land trusts may be able to take advantage of external support in financing SLPO programs. Because land trusts by definition qualify as charitable entities under the tax code, below-market transfers of options or fee simple interests to land trusts can have substantial tax benefits for landowners.[140] Public subsidies, such as those from federal programs that already provide funding for coastal acquisition[141] or from the National Flood Insurance Program ("NFIP"),[142] could also help defray costs.[143]

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136. LAND TR. ALL., 2015 NATIONAL LAND TRUST CENSUS REPORT 3 (2016), http://s3.amazonaws.com/landtrustalliance.org/2015NationalLandTrustCensusReport.pdf [https://perma.cc/FU36-8Q5F]. This census was based on data voluntarily submitted by land trusts, so the actual figure may be higher.

137. LAND TR. ALL., 2010 NATIONAL LAND TRUST CENSUS REPORT 5 (2011), http://www.atlanticcoastconservancy.org/Documents/2010-final-report.pdf [https://perma.cc/X2BT-6V3B].

138. Matthew Pearson & Daniel Patrick O'Connell, *Building a Sustainable Capital Structure for Land Trusts*, LAND TR. ALL., https://www.landtrustalliance.org/news/building-sustainable-capital-structure-land-trusts (last visited Oct. 11, 2017) [https://perma.cc/JKS9-48YC]. Increasingly, the strategy of land trusts is to "fundraise, invest and finance" instead of merely to "fundraise and spend," allowing them to dramatically enlarge their coffers. *Id.*

139. Collaboration among land trusts may also generate cost savings and increase access to funding. *See Collaborative Opportunities for Land Trusts*, PA. LAND TR. ASS'N, http://conservationtools.org/guides/101-collaborative-opportunities-for-land-trusts (last visited Jan. 25, 2018) [https://perma.cc/9UGB-LXKJ] (outlining the benefits of collaboration).

140. Under I.R.C. § 170(h) (2012), fee simple donations are deductible, while donations of options are not. However, a landowner would receive a deduction for the transfer, at a below-market price, of property upon a land trust's exercise of the SLPO. *See infra* note 195 (noting the tax benefits of bargain sales). Effectively, then, "transferring an [option] that is later exercised instead of transferring a [fee simple interest] only delays accrual of a § 170(h) benefit." Cheever & Owley, *supra* note 12, at 27 n.143.

141. *See, e.g.*, 42 U.S.C. § 5170c (2012) (hazard mitigation funding program).

142. *Cf. Seeking Higher Ground: How to Break the Cycle of Repeated Flooding with Climate-Smart Flood Insurance Reforms*, NAT'L RESOURCES DEF. COUNCIL 6 (July 2017), https://www.nrdc.org/sites/default/files/climate-smart-flood-insurance-ib.pdf [https://perma.cc/TD8P-NA37] (proposing that NFIP funds be dedicated to pre-flood buyouts instead of used for the inefficient purpose of rebuilding damaged properties).

143. *See* Cheever & Owley, *supra* note 12, at 22 (discussing the use of disaster relief funds to finance option transactions). For an examination of local mechanisms for funding adaptation, see generally Jonathan Rosenbloom, *Funding Adaptation*, 47 J. MARSHALL L. REV. 657 (2013).

C. Before the Storm: Designing SLPOs

Unlike most real estate options, which tend to be immediately exercisable, the defining feature of SLPOs is that vesting is contingent on the effects of sea level rise. This distinction raises several practical and legal issues. Most basically, how can options be temporally linked to sea level rise in this way? To maximize efficiency, SLPOs should vest when, but not until, sea level rise begins to endanger a given property. Thus, choosing the right contingencies is critical. Additionally, in light of the gradual and unpredictable nature of sea level rise, SLPO option periods[144] will generally be substantially longer than those of traditional options. But because option payments are a product of both the likelihood an option will be exercised as well as the length of the option period, how should SLPO option payments be calculated? Finally, given the indistinct time horizons involved, what sort of legal obstacles might SLPOs face from restraint on alienation rules? The sections below consider each of these issues in detail.

1. Uncertainty Quantified: Calculating SLPO Option Payments

As a legal matter, option contracts generally require consideration to become irrevocable,[145] and practically, most landowners will surely demand compensation.[146] How much, then, should landowners receive in exchange for selling an SLPO? Doctrinally, option prices are related to an option's likelihood of being exercised, and given the low probability that options conditioned on sea level rise will both become exercisable and be exercised—at least in the eyes of the average landowner—this price should be relatively modest.[147] At the same time, the option price and option period are directly related, so larger up-front payments may be necessary to

144. As referred to here, the "option period" is the period between execution of the option contract and when the option vests. Once the option becomes exercisable, the contract would provide for another period during which the land trust must decide whether to exercise the option. This second period should be much shorter (e.g., a few months).

145. LORD, *supra* note 116.

146. *Cf.* Shorna Allred & Gretchen Gary, *Flood Resilience Education in the Hudson River Estuary: Needs Assessment and Program Evaluation*, N.Y. ST. WATER RESOURCES INST. 4 (2015), https://wri.cals.cornell.edu/sites/wri.cals.cornell.edu/files/shared/2014-Allred_Gary_WRI-report-Final-Feb2015.pdf [https://perma.cc/7R6M-7HGQ] ("Streamside landowners are more likely to adopt a desired management practice on their land if they receive financial assistance.").

147. Cheever & Owley, *supra* note 12, at 25–26. Objectively, this probability should be relatively low due to the unpredictability of sea level rise in a given area. And in light of the widespread skepticism about sea level rise among coastal interests, this probability may be even lower in the subjective view of many landowners.

compensate optionors for the longer option periods of SLPOs.[148] Regardless of its amount, however, the option payment can be credited to the ultimate purchase price paid to acquire the underlying property so as to reduce the total costs of SLPO programs.[149] In that case, because it would simply be credited to the purchase price, the size of the option payment would not affect the overall cost of exercising SLPOs.

Still, option payments can have important subsidiary effects on landowner decisionmaking. Intuitively, because landowners will receive the option payment regardless of whether SLPOs are ever exercised, higher option prices are likely to generate greater participation. Likewise, landowners tend to place disproportionate weight on option payments because of their immediacy.[150] For this reason, higher option payments may motivate landowners to agree to concessions on other issues, such as coastal defense restrictions or lower purchase prices.[151]

2. Tying Option Contracts to Sea Level Rise

Typically, options are immediately exercisable and terminate upon a date certain, but they can also be structured to vest upon the occurrence of a condition precedent.[152] This possibility presents the legal hook with which to link sea level rise and the option itself, which would become exercisable only when sea level rise concretely affects a given property. In order to create conditions that capture the full range of impacts, SLPOs should vest when a property experiences either (1) the gradual effects of sea level rise (e.g., erosion or tidal movement), or (2) its acute effects (e.g., flooding).[153]

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148. Katz, *supra* note 121, at 2207.

149. This is a conventional aspect of option agreements. *See* Country Club Oil Co. v. Lee, 58 N.W.2d 247, 250 (Minn. 1953) (holding an option valid "notwithstanding that the contract provides that in the event of the exercise of the option the sum paid for the option is to be applied as a part of the purchase price of the property"); *see also Purchase Option Agreement, Conservation Easement*, ME. COAST HERITAGE TR., http://www.mltn.org/resources/information-resources.php (last visited Oct. 9, 2017) [https://perma.cc/LE3D-6GK2] (under "Land Protection," click link to open "Purchase Option Agreement, Conservation Easement") (providing a model OPCE agreement with a clause specifying that the option price will be credited to the purchase price).

150. *See infra* note 197 and accompanying text (discussing this cognitive bias).

151. *See infra* notes 160–161 and accompanying text (considering the value of coastal defense restrictions); *infra* notes 196–197 and accompanying text (analyzing the inverse relationship between the option price and purchase price).

152. Brown, *supra* note 116, at 165; *see, e.g.*, Wells v. Gootrad, 736 P.2d 1366, 1367–69 (Idaho Ct. App. 1987) (upholding a repurchase option exercisable upon the optionor's cessation of employment with the optionee).

153. These conditions resemble those imposed by Maine's Sand Dune Rules, which limit reconstruction of buildings damaged by more than fifty percent of their value and require removal of structures located seaward of the tide line. 06-096-355 ME. CODE R. § 5 (LexisNexis 2010); MARINE LAW INST. ET AL., U.S. EPA, EPA-230-R-95-900, ANTICIPATORY PLANNING FOR SEA-LEVEL

Under the first condition, SLPOs would become exercisable when the tide's gradual encroachment reaches a certain point vis-à-vis the subject property. Perhaps the best measure for this effect is the mean high tide line ("MHTL"), which is defined differently by state but generally refers to the average height of high tide over a certain period of time.[154] When the MHTL reaches a certain agreed upon point, the SLPO would vest,[155] permitting a transfer before too much of the property is inundated.[156] Although this would require land trusts to track the MHTL, such monitoring can be done rather easily with modern technologies.[157] Land trusts could then periodically notify landowners of the MHTL's location, making them fully aware of when SLPOs may become exercisable.[158]

The second condition would focus instead on the severe effects of sea level rise. The most administrable trigger would be the occurrence of property damage—attributable to storm surge or flooding—exceeding a certain percentage of the property's value.[159] Critically, this trigger would obviate the need to rebuild damaged structures and protect against future flooding. On the other hand, this condition may be generally unappealing to landowners given the frequency of hurricanes and other storms. However, adding qualifications—for example, that this condition only covers ordinary storm damage—could help alleviate such concerns. Ultimately, this would depend on negotiation.

To preserve the utility of SLPOs, it may be necessary to restrict landowners' ability to construct coastal defenses that would prevent these conditions from occurring.[160] Not only would these restrictions

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RISE ALONG THE COAST OF MAINE 5-5 to 5-7 (1995), https://www.gpo.gov/fdsys/pkg/CZIC-ht393-m3-a57-1994/pdf/CZIC-ht393-m3-a57-1994.pdf [https://perma.cc/CYC4-CTNV].

154. *See, e.g.*, FLA. STAT. ANN. § 177.27 (West 2017) (defining MHTL as the average height of high waters over a nineteen-year period). Though they may entail more difficult monitoring, other proxies, such as the vegetative line or annual rate of erosion, exist as well. *See, e.g.*, 15A N.C. ADMIN. CODE 7H.0308(a) (2017) (employing these measures to impose setback requirements).

155. *Cf.* TITUS, *supra* note 127, at 50 (describing a type of rolling easement under which a parcel is "transferred . . . when sea level rises one meter").

156. *See* Hayat & Moore, *supra* note 131, at 10344 ("More emphasis should be placed on increasing participation in buyout programs *pre*-disaster, as that may result in the complete avoidance of any future damage.").

157. *See* PILKEY ET AL., *supra* note 5, at 85 (providing an example of an easy-to-use flood mapping tool).

158. *See infra* notes 242–244 and accompanying text (emphasizing the legal, political, and economic importance of this notice).

159. *See supra* note 153 (describing such a provision in Maine's Sand Dune Rules); *see also* Hayat & Moore, *supra* note 131, at 10339 (proposing, as a strategy for retreat, that landowners "agree not to rebuild following floods that cause substantial damage to their property (that is, damage exceeding 50% or more of the property's fair market value) and, instead, to accept a government buyout of their property and relocate").

160. *See* Gosfield, *supra* note 117, at 155 ("[T]he option holder can ask the optionor to agree not to change the . . . use of the property in a way that would . . . decrease the value for the option

allow SLPOs to proceed as designed, but they would also prevent the environmental harms such activities cause.[161] While some landowners may find such prohibitions unattractive,[162] land trusts could address this concern in various ways, such as by providing higher option payments for landowners who agree not to build coastal defenses. In certain cases, however, negotiation on this issue may not even be necessary. For example, some landowners may be unwilling to pay for defense measures if they expect to abandon their land in the near future,[163] and in some places regulations already limit the erection of coastal defenses.[164] Additionally, these restrictions may arise from the implied covenant of good faith, which constrains an optionor's ability to interfere with conditions precedent and with an optionee's ability to exercise an option.[165]

3. Legal Obstacles to Impact-Oriented Conditions Precedent

Because the option period is not defined by a date certain, SLPO contracts could be subject to various common-law doctrines—most notably, the rule against perpetuities and the rule against unreasonable restraints on alienation.[166] The rule against perpetuities, in its classical formulation, holds that a future interest "must vest, if at all, not later than twenty-one years after some life in being at the creation of the interest."[167] Traditionally, options have been subject to the rule so that if exercisable beyond the perpetuities period, an option would be void.[168]

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holder's intended use of the property."). Similarly, OPCEs "may require the landowner to maintain the property in its current state . . . ." Cheever & Owley, *supra* note 12, at 33.

161. *See supra* note 74 and accompanying text (noting that coastal defenses are environmentally costly).

162. *See* Rosenthal, *supra* note 88 (describing British landowners' desire to "build their own private sea defenses").

163. *See* TITUS, *supra* note 127, at 50 ("Anticipating the eventual transfer of the land as sea level rises, many owners will choose not to invest in shore protection.").

164. *See* Nolon, *supra* note 93, at 752–53 ("[Some state statutes] prohibit building bulkheads [or] seawalls . . . in vulnerable areas or require that structures be removed as the high tide line moves landward.").

165. *See* 25 LORD, *supra* note 116, § 67:84 ("[W]here the optionor . . . hampers performance of a condition precedent . . . the optionee is entitled to specific performance."); Brown, *supra* note 116, at 205 ("[The implied covenant] should lead to the rule that the optionor cannot change the property, either actively or passively, so as to interfere with the purposes for which he knew or should have known that the optionee obtained the option . . . .").

166. A third hurdle could be whether SLPOs would be enforceable against successors in interest. For a discussion of this issue, see Cheever & Owley, *supra* note 12, at 35–36.

167. JOHN CHIPMAN GRAY, THE RULE AGAINST PERPETUITIES § 201 (4th ed. 1942).

168. *See* Jesse Dukeminier, *A Modern Guide to Perpetuities*, 74 CALIF. L. REV. 1867, 1908 (1986) ("[Traditionally], an option . . . is treated like a future interest, contingent upon exercise of the option. If [it] can be exercised beyond the perpetuities period, [it] is void *ab initio*.").

Even so, SLPOs may escape invalidation for several reasons. First, because the purpose for which land trusts would acquire SLPOs is to effectuate the conservation of coastal areas and promote human safety, these transactions may be protected by the charitable trust doctrine,[169] which precludes application of the rule against perpetuities to trusts created for charitable purposes.[170] Moreover, the rule has experienced broadside attacks from legislatures and courts alike. Indeed, some states have repealed it altogether.[171] In other states, statutes[172] or courts[173] have limited the rule's application to only noncommercial transactions—that is, transactions that lack consideration—an approach supported by model laws such as the Uniform Statutory Rule Against Perpetuities[174] and the *Restatement (Third) of Property*.[175] Because SLPOs will typically involve consideration, the rule should not pose an obstacle in such states.

Even so, some states still apply the traditional rule, so that a temporal backstop may be desirable. One possibility is to insert a "savings clause" providing that the contract expires on the last day of

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169. *See* Matthew Towey, *The Land Trust Without Land: The Unusual Structure of the Chicago Community Land Trust*, 18 J. AFFORDABLE HOUSING & COMMUNITY DEV. L. 335, 352 (2009) (suggesting the charitable trust doctrine would apply under similar circumstances). *But see* Midland Grange No. 27 Patrons of Husbandry v. Walls, No. 2155-VCN, 2008 WL 616239, at *10 n.43 (Del. Ch. Feb. 28, 2008) ("[C]ontingent interests which are subject to conditions precedent, however, generally are not [preserved by the charitable trust doctrine].").

170. Matthew J. Richardson, Note, *Conservation Easements as Charitable Trusts in Kansas: Striking the Appropriate Balance Among the Grantor's Intent, the Public's Interest, and the Need for Flexibility*, 49 WASHBURN L.J. 175, 186 (2009). Purposes such as "the promotion of environmental quality and the preservation of the beauties of nature" are generally viewed as "charitable." Nancy A. McLaughlin & Mark Benjamin Machlis, *Protecting the Public Interest and Investment in Conservation: A Response to Professor Korngold's Critique of Conservation Easements*, 2008 UTAH L. REV. 1561, 1569 n.33.

171. *See* Grayson M.P. McCouch, *Who Killed the Rule Against Perpetuities?*, 40 PEPP. L. REV. 1291, 1292 (2013) ("What is perhaps surprising is the speed with which efforts to reform and improve the rule have been overtaken by a headlong rush to abolish it altogether. In . . . less than twenty years, at least half the states . . . have enacted statutes authorizing perpetual trusts . . . .").

172. *See, e.g.*, 54A CAL. JUR. 3D *Real Estate* § 714 (2018) (describing California's statute to this effect); *see also* Bauermeister v. Waste Mgmt. Co. of Neb., 783 N.W.2d 594, 598–600 (Neb. 2010) (summarizing modern perpetuities statutes); John K. Phoebus, Comment, *The Rule Against Perpetuities—The Implication of a Reasonable Time for the Performance of a Contingency to the Vesting of Future Interests in Commercial Transactions—Maryland's Hybrid Approach to the Rule Against Perpetuities in Commercial Contexts*, 101 DICK. L. REV. 619, 625–30 (1997) (surveying statutory reforms).

173. *See, e.g.*, *Bauermeister*, 783 N.W.2d at 598–600 (declining to apply the rule to a commercial option). Courts have also limited the rule in other ways, such as by implying a reasonable term for performance to save commercial contracts that would otherwise be invalid. *See, e.g.*, Coulter & Smith, Ltd. v. Russell, 966 P.2d 852, 857–58 (Utah 1998); *see also* Phoebus, *supra* note 172, at 620, 631–36 (surveying these judicial approaches).

174. *See* UNIF. STATUTORY RULE AGAINST PERPETUITIES § 4 (UNIF. LAW COMM'N 1990) (excepting "nonvested property interest[s] . . . arising out of a nondonative transfer" from the rule).

175. *See* RESTATEMENT (THIRD) OF PROP.: SERVITUDES § 3.3 cmt. a (AM. LAW. INST. 2000) [hereinafter RESTATEMENT] (providing that the rule does not apply to options).

the perpetuities period, a strategy generally upheld by courts.[176] Alternatively, the SLPO agreement could furnish an option to renew for limited periods, for which land trusts would pay additional consideration.[177] Either method should insulate SLPOs from invalidation by limiting their overall life. Certainly, land trusts could release SLPOs as situations develop, but a fallback date or renewal option would afford certainty by building this contingency into the contract from the start.

Because SLPOs could limit the marketability of properties, they may also be subject to alienation rules, which bar "unreasonable" restrictions on a party's ability to transfer property.[178] For real estate options, reasonableness "is determined by the duration of the option and the price."[179] Of particular importance is whether the purchase price is fixed or instead set at fair market value. Because they effectively "discourage improvement of the land," options with fixed prices are generally deemed unreasonable unless they have a limited duration.[180] In contrast, "[i]f the price is set at fair market value when the option is exercised, the practical effect of the restraint is much less than if the price is fixed, and a longer duration is justifiable."[181] Given their potentially lengthy option periods, SLPOs should therefore include a variable purchase price tied to fair market value.[182] To limit an option's duration, it may also be beneficial to include a fallback termination date or an option to renew. These measures should help to protect SLPOs from invalidation.

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176. *See* Cattail Assocs. v. Sass, 907 A.2d 828, 839–43 (Md. Ct. Spec. App. 2006) (upholding the validity of a contract because of its savings clause and citing cases with similar outcomes).

177. *See, e.g.*, Hidden Meadows Dev. Co. v. Mills, 511 P.2d 737, 739 (Utah 1973) (upholding an option agreement with renewal options because the agreement did not "indicate that the parties intended the option to continue for an unlimited duration").

178. RESTATEMENT, *supra* note 175, § 3.4.

179. RESTATEMENT, *supra* note 175, § 3.4 cmt. e. Armoring restrictions may also be important here since they could limit marketability. Ultimately, the reasonableness of these restrictions probably depends on the option's price and term. *See* Brown, *supra* note 116, at 205:

> [T]he optionor cannot change the property, either actively or passively, so as to interfere with the purposes for which he knew or should have known that the optionee obtained the option but such prohibition shall not unreasonably interfere with the optionor's beneficial use of the property prior to the option being exercised. What would be reasonable would naturally be dependent in part on the duration of the option.

Use restrictions appear to be a standard aspect of OPCEs, and the same strategies to fend off unreasonable restraint arguments generally should help mitigate this issue as well. Cheever & Owley, *supra* note 12, at 33.

180. RESTATEMENT, *supra* note 175, § 3.4 cmt. e; *see, e.g.*, Iglehart v. Phillips, 383 So. 2d 610, 615–16 (Fla. 1980) (invalidating an option with a fixed price and unlimited option period).

181. RESTATEMENT, *supra* note 175, § 3.4 cmt. e.

182. *See infra* Section III.D (proposing the use of variable purchase prices in SLPO contracts).

While it thus appears that modern iterations of these common-law rules should not present insuperable obstacles—especially with the strategic use of certain fallback provisions—judicial validation is not guaranteed. Indeed, few courts have considered option periods as lengthy as those envisioned here.[183] Consequently, the ideal way to resolve any lingering uncertainty in this regard would involve protective legislation—a prospect not out of the question given the modern trend of circumscribing these common-law doctrines.[184]

D. After the Storm: Exercising SLPOs

If and when the conditions discussed above are satisfied, land trusts would have the right to purchase subject properties within a certain amount of time[185] and at a price specified in the option contract. For many options, this price is a fixed amount, but with SLPOs, which have option periods that could last for decades, a fixed price would be problematic. Instead, the purchase price should be set at some percentage of the relevant property's fair market value as assessed at the time of exercise.[186]

Beyond simply making sense given the lengthy option periods involved, this approach would render SLPOs a more workable tool for land trusts. From a legal standpoint, a variable purchase price minimizes the likelihood that a contract is an unreasonable restraint on alienation.[187] Moreover, a variable purchase price should reduce the financial burden on land trusts since the value of a property after being affected by sea level rise should be significantly lower than its value today.[188] Indeed, a decline in property values is a common consequence

183. Cheever & Owley, *supra* note 12, at 34–35.

184. *Cf. id.* at 37–44 (making the case for statutory recognition of OPCEs).

185. This would be a second option period. *See supra* note 144 (noting the fact that SLPOs would have two option periods).

186. It may be necessary for SLPO contracts to specify how fair market value is to be calculated. *See* Leiserv, LLC v. Summit Entm't Ctrs., LLC, No. 15-cv-01289-PAB-KLM, 2016 WL 1046274, at *3 (D. Colo. Mar. 16, 2016) ("[T]he weight of authority supports the proposition that a contract term based on fair market value does not render an agreement unenforceable where the parties agree to a methodology by which fair market value is to be determined."). Recall that the option payment can be credited toward the purchase price. *See supra* note 149 and accompanying text.

187. *See supra* Section III.C.3 (making this point).

188. *See* JOHN ENGLANDER, HIGH TIDE ON MAIN STREET: RISING SEA LEVEL AND THE COMING COASTAL CRISIS 142 (2d ed. 2013) ("Property values will likely go underwater long before the property does."); Nolon, *supra* note 44, at 337–50 (describing the effects of sea level rise on property values in various areas); Ian Urbina, *Perils of Climate Change Could Swamp Coastal Real Estate*, N.Y. TIMES (Nov. 24, 2016), https://www.nytimes.com/2016/11/24/science/global-warming-coastal-real-estate.html [https://perma.cc/4JMP-UXED] (reporting on the growing concern about the effects of sea level rise on coastal real estate markets). This should be true as a relative matter for

of impactful storms. In coastal New Jersey, for example, property values fell precipitously after Hurricane Sandy not only because of the physical and psychological devastation caused by the storm, but also because of a disappearance of financing and rise in insurance premiums.[189] Even though landowners will receive less money for their properties as a result of the timing of this valuation, they would likely struggle to find another buyer anyway with their properties in such precarious shape.[190] Therefore, in addition to reducing program costs, this valuation scheme should theoretically minimize landowner resistance to eventually selling their property pursuant to SLPOs.

Ultimately, the exact figure will be a matter of private ordering, but this Note contends the purchase price should, and typically will, be below market—that is, at a discounted percentage (e.g., seventy-five percent) of fair market value as measured at the time the SLPO is exercised. Normatively, a below-market purchase price would have important effects. Most notably, it would lower the societal costs of accomplishing retreat.[191] While governments could exercise eminent domain on threatened coastal properties—in fact, many scholars have characterized eminent domain as akin to a purchase option[192]—they must pay "just compensation" (i.e., the property's fair market value).[193] Consequently, SLPO transactions featuring below-market purchase prices would facilitate the acquisition of properties—and thus foster retreat—more cost-effectively than could otherwise be accomplished.[194]

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both program-wide costs (i.e., the total costs of acquiring and exercising SLPOs) and per-property costs. Yet the per-property costs as an absolute matter would depend on the localized effects of sea level rise. Interestingly, one study has found the median value of at-risk properties to be $296,296. Krishna Rao, *Climate Change and Housing: Will a Rising Tide Sink All Homes?*, ZILLOW (June 2, 2017), https://www.zillow.com/research/climate-change-underwater-homes-12890/ [https://perma.cc/C3AB-GZC3]. This figure serves as a helpful but generalized reference point for assessing the per-property costs of SLPOs. But assuming land trusts are able to obtain below-market prices, and because market value will be measured after the property is impacted by sea level rise, the median per-property cost should be lower than that figure.

189. Nolon, *supra* note 44, at 322.

190. *See* sources cited *supra* note 188 (suggesting sea level rise will severely reduce demand for coastal properties); *see also* Nolon, *supra* note 44, at 339 (discussing Sidney, New York, where, after acute flooding, "many buildings became impossible to sell").

191. Certainly, these savings would come at the expense of landowners, who would not receive the entire value of their properties. Even so, this may be a societally beneficial outcome since, assuming governments step in to fund retreat or pay for coastal defenses, society as a whole would otherwise bear these costs. *Cf.* GRANNIS, *supra* note 65, at 8 ("[G]overnments that fail to require adaptation will be requiring the community as a whole to pay for the costs of protecting some coastal properties.").

192. *See, e.g.*, Abraham Bell & Gideon Parchomovsky, *Givings*, 111 YALE L.J. 547, 602 (2001) (describing eminent domain as "a call option in the hands of the government").

193. W. Harold Bigham, *"Fair Market Value," "Just Compensation," and the Constitution: A Critical View*, 24 VAND. L. REV. 63, 63 (1970).

194. As discussed elsewhere, SLPOs have several other advantages over the use of eminent domain, which would presumably occur after properties have already been harmed by sea level

But why would landowners agree to below-market prices in the first place? Many may be motivated by the tax deduction that comes from making such a "bargain sale."[195] And as a matter of theory, the option price and purchase price are inversely related,[196] so landowners—especially those skeptical of sea level rise who thus believe SLPOs will never vest—may agree to a lower purchase price in exchange for a higher option payment, which is guaranteed. Indeed, because "people tend to give more decisional weight to factors that are more salient or memorable to them," optionors may be willing to trade a higher option price for a lower purchase price because the former is more prominent in their decisionmaking.[197] Compared to other post–sea level rise outcomes, landowners may also agree to a discounted purchase price given the relative certainty of SLPOs. To be sure, there is no guarantee land trusts will exercise SLPOs, though the lower the purchase price, the more likely they are to do so. But in a real estate market destabilized by sea level rise—where the likelihood of receiving compensation from other buyers or government programs is thoroughly unpredictable—below-market compensation would surely be preferable to nothing at all.[198] Of course, for this to affect negotiations, landowners must appreciate these market risks before signing the option contract.

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rise. *See supra* note 131 and accompanying text (discussing problems with public acquisition programs); *infra* Section IV.A (addressing the benefits of voluntary approaches); *infra* Section IV.B (analyzing the value of proactive strategies). In particular, private SLPO programs would have clear political advantages over the use of eminent domain, which carries extreme political costs. *Compare* Byrne, *supra* note 35, at 114 ("Eminent domain is exceedingly unpopular and, therefore, generally avoided by elected officials."), *with supra* notes 133–134 and accompanying text (describing the political palatability of private conservation transactions).

195. *See* Leigh McKee, *Income Tax Consequences of Dispositions of Development Rights in Property*, 97 J. TAX'N 347, 355–56 (2002) (describing the tax mechanics of bargain sales). A taxpayer who makes a bargain sale to a qualifying entity "is entitled to a charitable contribution deduction under [26 U.S.C. § 170(a) (2012)] . . . equal to the difference between the fair market value of the property and the amount realized from its sale." C. Timothy Lindstrom, *Recent Developments in the Law Affecting Conservation Easements: Renewed Tax Benefits, Substantiation, Valuation, "Stewardship Gifts," Subordination, Trusts, and Sham Transactions*, 11 WYO. L. REV. 433, 434 n.4 (2011). Applied to SLPOs, a landowner who sells her land to a land trust at a below-market price pursuant to an SLPO contract should be entitled to a tax deduction for the difference between the purchase price and the property's value. *See* Klauer v. Comm'r, 99 T.C.M. (CCH) 1254 (T.C. 2010) (upholding a charitable deduction for a bargain sale that occurred pursuant to an option agreement); *see also* Lindstrom, *supra*, at 471–75 (discussing *Klauer*).

196. Katz, *supra* note 121, at 2207.

197. *Id.* at 2213.

198. *See supra* notes 188–190 and accompanying text (considering the likely collapse of real estate markets as a result of sea level rise); *see also infra* notes 201–203 and accompanying text (highlighting the significance of the purchase payment as relocation funding). For example, whether governments would have the political capital to spend taxpayer money on properties approaching worthlessness is unclear, so that it would be risky for landowners to count on the government purchasing their property through eminent domain. *See* Byrne, *supra* note 35, at 114 ("Eminent domain is exceedingly unpopular and, therefore, generally avoided by elected officials.").

But risk-averse landowners and those wary of sea level rise should often be willing to hedge their bets in this way.[199]

Beyond its ex ante significance to the utility of SLPOs, the purchase payment should also have important effects in assisting landowners with the backend of retreat—relocation. Relocation is an issue fraught with hard questions, such as where to send retreating populations and how to fund such movement.[200] While the first of these questions is beyond the scope of this Note, SLPOs provide at least a partial answer to the second. By furnishing compensation *at the time of abandonment* (assuming, of course, they are exercised),[201] SLPOs can furnish landowners with relocation funding,[202] a feature generally absent from many other retreat measures such as land use regulation. Because other financing may be largely inaccessible as sea levels continue to rise, this liquidity may be critical for landowners looking to acquire replacement land.[203]

Once obtaining fee simple, land trusts should conserve coastal properties by returning them to their natural state. After all, the chief focus of retreat is on "reigning in human development to, first, remove the populace from lands likely to be lost, and second, provide more natural land to act as a buffer between rising seas and future human habitations that have moved farther inland."[204] Thus, land trusts should strive to foster the redevelopment of wetlands and other natural features that serve important environmental functions such as flood protection.[205] Alternatively, land trusts might lease the land for low-impact agriculture or grant public access for parks and other

199. *See infra* Section IV.A (analyzing landowner incentives to participate in SLPO programs).

200. *See* Robert R.M. Verchick & Lynsey R. Johnson, *When Retreat Is the Best Option: Flood Insurance After Biggert-Waters and Other Climate Change Puzzles*, 47 J. MARSHALL L. REV. 695, 698 (2014) (discussing the issues associated with relocation).

201. The timing of this payment is critical. Often, landowners who are paid up front or otherwise informed that they will eventually have to relocate continue to develop their property, banking on the hope of a government bailout. Joseph L. Sax, *The Fate of Wetlands in the Face of Rising Sea Levels: A Strategic Proposal*, 9 UCLA J. ENVTL. L. & POL'Y 143, 147–48 (1991). Sax proposed to alleviate this issue by using a sale-leaseback scheme wherein the purchase price is invested and withheld from landowners until abandonment. *Id.* at 153–55. SLPOs would have largely the same effect, but should be more attractive to landowners since (1) they receive an option payment up front, and (2) they still remain owners, as opposed to tenants, in the interim.

202. *See* PILKEY ET AL., *supra* note 5, at 58–59 (highlighting the provision of relocation funding as an advantage of acquisition programs); Lisa A. St. Amand, *Sea Level Rise and Coastal Wetlands: Opportunities for a Peaceful Migration*, 19 B.C. ENVTL. AFF. L. REV. 1, 27–28 (1991) (describing a retreat program that was effective in part because it supplied relocation funding).

203. Nolon, *supra* note 44, at 352–56.

204. Blake Hudson, *Relative Administrability, Conservatives, and Environmental Regulatory Reform*, 68 FLA. L. REV. 1661, 1687 (2016).

205. *See* Byrne & Grannis, *supra* note 10, at 269 ("Retreat policies are also more effective at preserving coastal resources that provide natural flood protection and other environmental benefits . . . .").

recreational activities such as ecotourism.[206] Whatever the specific use, the basic idea would be to cease occupation and promote natural processes that can lessen the impact of sea level rise.[207]

IV. ASSESSING THE SLPO AS A RETREAT STRATEGY

Up to this point, this Note has examined the practicalities of designing SLPOs. This Part now pivots to an exploration of the strengths and weaknesses of SLPOs as an adaptation tool based on three criteria: participation, flexibility and proactivity, and efficiency. Section A considers the level of participation SLPO programs may garner, which will in part animate their larger success as a retreat strategy. Next, Section B outlines the ways in which SLPOs provide flexibility moving forward and proactively inform landowner behavior so as to reduce the ultimate costs of retreat. Finally, Section C assesses the efficiency of SLPOs from an economic standpoint.

A. Participation: The Conundrum of Voluntary Programs

The consensual nature of SLPOs and other voluntary transactions affords a number of important benefits in implementing retreat. For example, because landowners can choose whether to participate, they have a voice in when and how they retreat, which can increase buy-in and avert future challenges.[208] Unlike regulatory retreat measures, consensual transactions are also beyond the reach of the Takings Clause.[209] This, in turn, has several notable consequences.

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206. *See* NORDSTROM, *supra* note 23, at 233–35 (assessing the recreational value of coastal areas); *cf.* Jacob T. Cremer, *Fighting the Lure of the Infinite: Lease Conservation Easements at the Urban Fringe*, 40 ENVTL. L. REP. NEWS & ANALYSIS 10687, 10688 (2010) ("Agriculture may . . . coincide with . . . open-space retention[ ] and natural buffering . . . ."). Conversely, these uses are not available with conservation easements unless expressly provided for. Steven M. Hoffman, Comment, *Open Space Procurement Under Colorado's Scenic Easement Law*, 60 U. COLO. L. REV. 383, 408 (1989).

207. *See* Nicholas A. Robinson, *Legal Systems, Decisionmaking, and the Science of Earth's Systems: Procedural Missing Links*, 27 ECOLOGY L.Q. 1077, 1088–89 (2001) ("Coastal erosion rates increase with rising sea levels and storm surges are no longer buffered by wetlands and barrier islands. The natural buffering effects of these areas have been lost due to . . . development . . . .").

208. *See* Hoffman, *supra* note 206, at 410 ("[C]onsensual land use arrangements . . . are more likely to afford permanent, comprehensive protection . . . than are zoning regulations."); Rosenthal, *supra* note 88 (describing landowners' desire "for a voice in deciding what must be saved"). Further, SLPO programs do not face the same equity concerns as mandatory programs since landowners, both rich and poor, would have the choice of participating (subject, of course, to land trust capabilities). *Cf. supra* notes 108–109 and accompanying text (considering the frequent unfairness of mandatory retreat programs).

209. *See* Welsh, *supra* note 133, at 213 (noting that conservation easements, as voluntary conveyances, are immune from regulatory takings); sources cited *supra* notes 98–104 (discussing the potential vulnerability of retreat legislation to takings liability).

First, because SLPOs are based in contract and property law, which are viewed as far more stable than the muddled and ad hoc takings doctrine, the expectations of both land trusts and landowners are better protected.[210] Moreover, although the remedy for a taking is "just compensation" (i.e., fair market value) rather than invalidation,[211] this compensation can add up quickly for regulations with broad effect. In addition, takings claims precipitate litigation that is "uncertain, lengthy, expensive, and . . . stigmatizing."[212] In combination, these costs may counsel against regulating at all,[213] especially given the difficulty of discerning ex ante whether an action is a taking under current law.[214] Accordingly, SLPOs can achieve largely the same outcome as regulations—namely, compelling retreat—but without the same economic and political costs.

Despite these benefits, noncompulsory programs face concerns about participation and holdouts.[215] Certainly, SLPOs are not immune from such concerns, although participation may not be as problematic as it is for other voluntary programs. For example, unlike the use of conservation easements for habitat protection, the effectiveness of

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210. *Compare* Cheever, *supra* note 134, at 445–46 (noting the benefits afforded by the "durability" of property rights), *and* Richard A. Posner, *The Role of the Judge in the Twenty-First Century*, 86 B.U. L. REV 1049, 1066 (2006):

> The zone of reasonableness will tend to be narrow in fields of ideological consensus, for example, contract law, for in those fields judges do not need to rely on intuition; sharing common premises, they can reason to a result. . . . Most contract rules are default rules, that is, rules the parties can contract around, so it is important that they know what the rules are so that they can draft accordingly.,

with Susan Rose-Ackerman, *Against Ad Hocery: A Comment on Michelman*, 88 COLUM. L. REV. 1697 (1988) (analyzing and criticizing the "ad hocery" and inconsistency of takings jurisprudence).

211. Christopher Serkin, *The Meaning of Value: Assessing Just Compensation for Regulatory Takings*, 99 NW. U. L. REV. 677, 678 (2005); *see also* Andrew W. Schwartz, *No Competing Theory of Constitutional Interpretation Justifies Regulatory Takings Ideology*, 34 STAN. ENVTL. L.J. 247, 280 n.137 (2015) (contrasting this compensation remedy with the injunctive remedy for due process and equal protection violations).

212. Byrne & Grannis, *supra* note 10, at 274.

213. *Id.*; *see also* John D. Echeverria, *Regulating Versus Paying Land Owners to Protect the Environment*, 26 J. LAND RESOURCES & ENVTL. L. 1, 11 (2005) ("[I]f regulatory programs were to generate significant, recurring takings awards, the general expectation is that government would be forced to abandon the regulatory option.").

214. *See* Christopher Serkin, *Insuring Takings Claims*, 111 NW. U. L. REV. 75, 122 (2016) (highlighting the difficulty of forecasting takings liability in light of the "notoriously vague" standards involved).

215. *See* John D. Echeverria, *Skeptics Perspective on Voluntary Conservation Easements*, VA. LAND RTS. COALITION, http://www.vlrc.org/articles/176.html (last visited Oct. 10, 2017) [https://perma.cc/ZY8F-XSR4] ("The most fundamental problem with voluntary conservation easements is that they are voluntary."). The debate over voluntary versus mandatory programs is extensive. *Compare* Echeverria, *supra* note 213, at 15–18 (preferring mandatory regulation), *with* Cheever, *supra* note 134, at 445–49 (describing the benefits of voluntary programs).

which depends on preserving large swaths of contiguous land,[216] SLPOs can still be successful without universal participation in a given area. In other words, the societal gains from SLPOs are largely linear; ensuring human safety and avoiding the costs of reconstruction on one property does not necessarily depend on securing the same benefits on another. Even so, the greater the buy-in, the more effectively retreat can be accomplished, so participation is still an important consideration in assessing the value of SLPOs.

In general, the success of a voluntary relocation program depends on (1) persuading landowners of the gravity and imminence of sea level rise to them personally (i.e., psychological motivation), (2) while also making retreat the most financially enticing alternative (i.e., financial motivation).[217] Interestingly, psychological motivation for participation in an SLPO program may occur rather organically. Unlike issues that only impact landowners indirectly, such as threats to endangered species, most coastal landowners will personally feel the effects of sea level rise at some point given current projections.[218] And in contrast to most other retreat strategies, SLPOs would not trigger abandonment until a point in the future, theoretically lessening the impact of shortsighted justifications for not participating.[219]

Still, psychological and financial motivation will depend on the attitude, characteristics, and risk profile of each individual landowner.[220] For example, owners of vacation beach houses, which comprise a significant portion of coastal properties, may be more willing to sell SLPOs since the stakes of abandonment are lower.[221] Unlike other adaptive responses, however, SLPOs theoretically have

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216. *See* Echeverria, *supra* note 213, at 17 (questioning the efficacy of voluntary habitat conservation approaches at the "landscape level").

217. St. Amand, *supra* note 202, at 28.

218. *See* Aziz Z. Huq, *Does the Logic of Collective Action Explain Federalism Doctrine?*, 66 STAN. L. REV. 217, 258 (2014) ("If the holdout stands to lose all from noncooperation, bargaining may be more likely to succeed than if she can free ride and still gain something."); *see also* sources cited *supra* notes 17–20 (summarizing sea level rise projections).

219. This effect is an important aspect of sunrise policies. *See supra* notes 111–113 (defining sunrise policies and noting their ability to minimize current opposition to regulation); *see also* AMAR, *supra* note 111, at 474–77 ("[Sunrise rules can] overcome immediate entrenched interests and injustices and thereby achieve a more disinterested and just future state of affairs.").

220. *See* Cheikhna O. Dedah et al., Factors Influencing Private Landowner Restoration Investment Decisions in Coastal Louisiana 5 (Feb. 6–9, 2010) (unpublished paper presented at the Southern Agricultural Economics Association annual meeting), http://ageconsearch.umn.edu/record/56451/files/Dedah_SAEA_2010.pdf [https://perma.cc/G34G-3SJF]) (listing factors relevant to participation in resource management programs, including "property size, ownership reason, . . . age, fear of loss of property rights, and time span of the ownership").

221. *See* Titus, *supra* note 132, at 54 (noting that rolling easements are easier to implement where "the majority of coastal property owners are second-home owners").

something to offer a wide variety of landowners, regardless of their view on sea level rise. As an illustration, consider three hypothetical landowners: Landowner A does not believe sea level rise is occurring;[222] Landowner B recognizes sea level rise as a threat but nevertheless refuses to relocate because of sentimental attachment or inertia;[223] and Landowner C is wary of sea level rise and desires to relocate but lacks the current means to do so.[224] If a land trust were to approach each landowner and offer to purchase an SLPO, all three may initially be drawn to the option payment as immediate and unconditional compensation. Moreover, Landowner A may be happy to collect that consideration in exchange for nothing more than a promise to sell her land, contingent on events she believes will never transpire. In contrast, Landowner B may value an SLPO as a form of potential insurance, even though it raises the possibility of abandonment. Finally, Landowner C would likely jump at the opportunity to receive both an up-front and a back-end payment with which she can ultimately relocate.

Thus, for one subset of landowners, SLPOs are akin to betting against sea level rise, but with the prospect of a built-in financial safety net should they lose that bet. For another subset, SLPOs are enticing as a way to hedge against the complete loss of their homes; agreeing to an SLPO now presents an opportunity to obtain a return in the future that sea level rise may eventually foreclose.[225] As sea level rise worsens, this latter view should become more common, with participation increasing as a result.[226] In fact, such wariness may already be widespread, as one study has found that sixty-eight percent of floodplain landowners would consider participating in a preflood buyout program.[227]

Of course, that is not to say SLPOs will attract universal participation and acceptance, now or in the future. Currently, a

222. For example, one Smith Island resident was quoted as stating, "The whole sea-level rise—it's BS . . . . I've lived here my whole life and haven't seen a difference." Zaleski, *supra* note 1.

223. *Cf.* Kelo v. City of New London, 545 U.S. 469 (2005) (presenting a compelling example of landowners fighting to stay in their longtime homes).

224. *See, e.g.*, Davenport & Robertson, *supra* note 109 (describing the plight of low-income residents of Isle de Jean Charles who wish to leave the island given the danger of flooding).

225. *See* Katz, *supra* note 121, at 2217 ("[O]ptions . . . [can] be a way of betting on the future and hedging against the risk of other events."); Bloch et al., *supra* note 14, at 88 (noting the benefits of "hedg[ing] away" the risks of climate change). Of course, because there is no guarantee land trusts will exercise SLPOs, this is only a partial hedge.

226. *See* PILKEY ET AL., *supra* note 5, at 58–59 (describing an increase in participation in acquisition programs after Hurricane Sandy); Robin Kundis Craig, *Public Trust and Public Necessity Defenses to Takings Liability for Sea Level Rise Responses on the Gulf Coast*, 26 J. LAND USE & ENVTL. L. 395, 434 (2011) ("As sea level rise . . . accelerates[,] . . . the perception of sea level rise as a public crisis . . . is only likely to increase . . . .").

227. *Seeking Higher Ground*, *supra* note 142, at 7.

substantial hurdle to any retreat strategy lies in the perverse incentives created by flood insurance subsidies, an issue beyond the reach of SLPO programs and the bounds of this Note.[228] Additionally, the longer SLPOs last, the more likely landowners are to chafe at restrictions on defense measures,[229] and successors in interest who did not receive an option payment may resist deals previously agreed to.[230] Lastly, landowners may refuse to participate because of concerns about reducing the marketability of their property.[231] Certainly, external incentives, such as tax benefits or relocation subsidies, could be used to address some of these issues.[232] But for the reasons discussed above, the features of SLPOs should stimulate landowner participation in their own right.

B. Flexibility and Proactivity: Setting the Stage Today for Effective Retreat Tomorrow

Because they represent the right to acquire coastal properties without the obligation to do so, SLPOs confer flexibility that is valuable in responding to problems laden with uncertainty such as sea level rise.[233] In particular, land trusts and society are able to refrain from becoming wed to any one property or approach. By providing time to let situations play out and enabling funds to be dispersed among a greater number of properties,[234] SLPOs allow land trusts to avoid wasting resources where abandonment may occur by other means (such as regulation) or where it may become unnecessary.[235] This financial

228. The literature on the need to reverse these incentives is extensive. *See, e.g.*, Wriggins, *supra* note 107, at 423–37 (proposing ways to eradicate these incentives).

229. Cheever & Owley, *supra* note 12, at 15.

230. However, buyers will presumably pay less for properties subject to SLPOs, which is the effective equivalent of receiving an option payment.

231. At the same time, skepticism about sea level rise and the potentially lengthy time horizons involved may lessen both the impact of SLPOs on marketability and any landowner concern about that impact.

232. *See supra* notes 140–143 and accompanying text (considering the potential cost-reduction benefits of tax deductions and subsidies).

233. *See* Cheever & Owley, *supra* note 12, at 4–5 (emphasizing the importance of flexibility where climate change has created a "world in motion").

234. With that being said, land trusts should certainly prioritize the most at-risk properties, as this will maximize the benefits of retreat. *See* Hayat & Moore, *supra* note 131, at 10345 (proposing an adaptation approach focused on at-risk areas); *see also* GRANNIS, *supra* note 65, at 47 (providing considerations for strategic targeting).

235. Cheever & Owley, *supra* note 12, at 19–20.

flexibility should be worth the present costs of SLPOs[236] and, given the uncertainty surrounding sea level rise, is highly desirable.[237]

In the same vein, SLPOs are a proactive solution—in establishing a plan for retreat today, they set the stage now for future responses. This proactivity has notable political, legal, and economic consequences. Unlike strategies initiated only after sea level rise has already overwhelmed coastal communities, proactive approaches mitigate future conflict induced by desperation since sensitive decisions about retreat are made early on, when cooler heads prevail.[238] Similarly, because the possibility of abandonment is pushed into the future, landowners are more likely to focus on "what is truly right rather than what is in their own current interest."[239] Admittedly, delayed implementation may mean that SLPO contracts become more politically controversial over time as landowners—both those who were parties to the contract and successors who were not—resist deals previously agreed to.[240] But assuming government regulation or acquisition will be a very real alternative as sea levels continue to rise, most landowners would likely prefer to transfer their property to land trusts than to the government.[241]

Further, because retreat is an aspect of the parties' agreement from the start, SLPOs build abandonment into landowners' expectations in a way that reduces the overall costs of retreat. Such notice deprives future legal and political challenges of legitimacy and support[242] and lessens the emotional costs associated with the

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236. *See* GRANNIS, *supra* note 65, at 6 ("Proactive non-structural solutions are often more cost effective over the long term . . . than reactive responses."); Margaux J. Hall & David C. Weiss, *Avoiding Adaptation Apartheid: Climate Change Adaptation and Human Rights Law*, 37 YALE J. INT'L L. 309, 323 (2012) ("[T]he costs of adaptive practices likely outweigh the costs of harm from failure to adapt.").

237. *See* Bokuniewicz, *supra* note 68 (stressing the need to avoid an "irreversible commitment" of resources in light of uncertainty about sea level rise).

238. *Cf.* TITUS, *supra* note 127, at 103 ("[Rolling easements m]itigate eventual intra-community fights about whether to protect certain vulnerable areas, because a plan is negotiated when the consequences are far enough in the future for people to be reasonable.").

239. Serkin & Vandenbergh, *supra* note 113, at 45.

240. *See* Echeverria, *supra* note 213, at 22 ("[A]s years and decades pass . . . new owners of the underlying fee, who did not receive any direct financial reward for the [conservation] easement, may view the easement as a costly encumbrance.").

241. *See* Gattuso, *supra* note 131 ("Faced with the choice of government seizing your land or encumbering your land with a conservation easement, most landowners would . . . opt for the latter."); *see also* Cheever, *supra* note 134, at 446 (noting that encumbrances do "not create the perceptions of unfairness" that often arise from regulatory decisions).

242. *See* Titus, *supra* note 132, at 54 (noting that coastal landowners with contractual obligations to retreat in the future "would be more likely to hedge their challenges by preparing for the eventual abandonment, which would diminish both the credibility and emotional fervor of any political or legal challenges").

unexpected abandonment of one's property.[243] By the same token, a landowner cognizant of impending relocation is more likely to refrain from new development or renovations, minimizing the amount of investment that must eventually be abandoned.[244]

Although often expensive initially, commentators view proactive approaches as ultimately more cost-effective than reactive strategies that may appear less costly in the short term.[245] Under the assumption that retreat will eventually be necessary, taking steps today to systematically implement retreat will almost certainly be cheaper and more effective than hurried, disaster-induced withdrawal in the future. "[W]e can walk away methodically, or we can flee in panic,"[246] and SLPOs provide the means to do the former.

C. Efficiency: Making the Best of a Bad Situation

Finally, SLPOs represent an economically efficient strategy for adapting to sea level rise. For one, private retreat programs partially displace the need for regulation and the expenditure of public resources,[247] allowing governments to focus on areas where other strategies are preferable. Thus, SLPOs are an efficiency-maximizing supplement to, and replacement for, governmental retreat efforts. Due to their design, SLPOs also provide a means of efficiently managing the timing of retreat. As outlined in Section III.C.2, SLPOs can be structured so that retreat coincides with the impacts of sea level rise. Unlike tactics that effectuate retreat before the consequences of sea level rise are imminent, this impact-oriented approach permits utilization of coastal properties while it is still possible,[248] facilitating an equilibrium of coastal development efficient in the short term without being wasteful in the long term.[249] And although SLPOs may

243. *See* TITUS, *supra* note 127, at 105 ("[Proactive solutions can r]educe unexpected losses from economic and emotional investments in properties that are unexpectedly abandoned . . . .").

244. *See id.* at 134 fig.15 ("With rolling easements, a house must eventually be abandoned as well, but the eventuality has been incorporated into the expectations of the owner, who forgoes renovations.").

245. *See* sources cited *supra* notes 235–236.

246. PILKEY ET AL., *supra* note 5, at 9.

247. *See* Richardson, *supra* note 170, at 180 ("When conservation efforts occur as transactions between individual landowners and private land trusts, the government can reallocate resources previously needed for environmental regulation.").

248. *See* TITUS, *supra* note 127, at 51 ("[With rolling easements,] wetlands or beaches can migrate inland as sea level rises, while the landowner is assured of the continued enjoyment of her property until the sea reclaims it."); Sax, *supra* note 201, at 147 (noting that immediate acquisition would cause society to "forego[] the benefits of development for many years").

249. *See* TITUS, *supra* note 127, at 134 fig.15 ("With rolling easements, . . . the eventuality [of abandonment] has been incorporated into the expectations of the owner, who forgoes

ultimately trigger the disappearance of coastal communities, this continued occupation lessens coastal blight for the time being—at least until dissolution would occur because of sea level rise anyway. Lastly, as with retreat generally, SLPOs reduce the externalities coastal landowners impose on society, which currently subsidizes flood insurance, resistance measures, and the postdisaster rebuilding of coastal areas.[250]

CONCLUSION

Ultimately, if current projections play out, there will be no cure-all for the challenges presented by sea level rise. Rather, success will require using every tool available, with the efficacy of each in a given situation depending on a litany of factors, such as geography, politics, and funding. Mitigation, accommodation, resistance, and retreat will all be necessary in certain cases. One device that should become an important part of this arsenal is the SLPO. Like other retreat strategies, SLPOs are a way to usher coastal communities to higher ground, but do so in a way that postpones abandonment until absolutely necessary. This approach proactively and efficiently implements retreat without limiting future options. Simultaneously, SLPOs temper the societal costs of retreat while still offering landowners a financial means for relocation. As private, voluntary transactions, they also avoid many of the thorny legal and political issues that often undermine the viability of retreat. But perhaps most importantly, SLPOs can leverage the current political resistance to withdrawing from coastal areas. Achieving this buy-in now will be critical if—and more likely when—retreat becomes the only available option.

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renovations."); St. Amand, *supra* note 202, at 3 ("Development can proceed, but the risk of abandonment becomes one of the forces shaping the market for coastal property.").

250. *See* GRANNIS, *supra* note 65, at 8 ("[G]overnments that fail to require adaptation will be requiring the community as a whole to pay for the costs of protecting some coastal properties."); PILKEY ET AL., *supra* note 5, at 80 (describing these externalities).

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