I. INTRODUCTION

This article addresses a novel and potentially significant issue raised by the prospect of rising sea levels due to climate change: how should government regulate and otherwise manage uses of lands protected from rising seas (at least temporarily) by coastal defense structures? The notable feature of these lands from a legal and policy perspective is that, but for the defense structures, they would be inundated by the ocean and, depending on the particular circumstances and applicable state law governing shifting coastal boundaries, transformed from private to public ownership. With the defense structures in place, however, private citizens can continue to use these lands as they have in the past, protected from the encroaching seas. Given the expected rapid rise in sea level due to climate change, and the strong incentives for citizens to build structures in an attempt to hold back the sea to protect their homes and businesses, the amount of land behind defense structures is likely to become quite significant in the future.

This land use issue has been made more significant by a very important but little noticed decision of the U.S. Court of Appeals for the Ninth Circuit suggesting that the government has a strong claim to public ownership of lands protected from rising tides by coastal defense structures that would be inundated in the absence of such structures. In United States v. Milner, a panel of Ninth Circuit judges held that the boundary line between

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1. 583 F.3d 1174 (9th Cir. 2009), cert denied, 130 S. Ct. 3273 (2010).
publicly owned tidelands and private uplands migrates landward with the rising sea, even if the landward progress of the sea is physically blocked. In other words, the boundary between public and private lands is set by extending the horizontal plane of the surface of the sea at mean high water landward to the point that the sea would reach if it were not blocked by coastal defense structures, despite the fact that the sea is not actually reaching inland to that point.

Assuming Milner is good law—and there are plausible grounds for disputing this conclusion—the decision raises challenging new questions about how to manage coastal lands. Under the traditional legal rules governing coastal boundaries, when the sea advances landward and erodes the shore, the boundary between private and public lands generally moves landward along with the advancing waters. In the era of climate change, it is likely (though this premise is also debatable) that this traditional rule should apply as sea level rises and erosion proceeds faster and farther, with the result that more private lands will be converted from private to public ownership. The Milner case makes the complex issue of coastal boundaries in the era of climate change even more complex because it suggests that extensive areas of coastal land that have long been in private hands and that are still physically susceptible to private use (at least temporarily) because they are protected by defense structures, should be deemed to be owned by the public as well. The issue is of obvious theoretical interest but also has enormous economic significance; many hundreds of square miles of very valuable coastal property may need to be recognized as public property under this decision.

The Milner decision presents a series of challenging new legal problems: (1) assuming the scope of public ownership of coastal lands will indeed expand significantly, as Milner suggests, how (if at all) should the government exercise its new ownership interest, such as deciding whether the land should be devoted to public or private purposes; and if to public purposes, what public purposes; and if to private purposes, for the benefit of what private parties and for what private purposes; (2) what is or should be the nature of the former owners’ remaining legal rights, if any, in the land they formerly owned; (3) what kinds of contractual and other arrangements should be made to maintain (or permit new) private uses of the affected lands consistent with

2. Id. at 1186-91.
the new public ownership of the lands; and (4) how should these lands be handled for purposes of local property taxation and what are the implications of these choices for local governments?

The first section of this article outlines the traditional legal rules governing changes in property boundaries along the shoreline, and describes how these rules may be applied and modified in the era of climate change. The second section describes the Milner decision and some of the questions raised by this important case. Finally, the third section, which proceeds on the assumption that Milner was correctly decided, addresses the different policies governments might adopt for managing publicly owned lands behind coastal defense structures. The article ends with a brief conclusion.

II. TRADITIONAL LAW GOVERNING EROSION IN THE ERA OF CLIMATE CHANGE

The basic rules governing the location and movement of property lines along the ocean shoreline are well established. Diverse individuals and entities own private property along the coast and often pay a premium price for their properties, whether based on the commercial value of the ability to gain access to navigable waters or the aesthetic and recreational value of living on the shore. At the same time, each state owns the submerged lands from the coastline out to the three mile limit. The boundary line between public and private ownership is generally set by the mean high water line.4

The ocean shore is a notoriously unstable feature of the landscape over time and the law has adapted to this reality. According to traditional doctrine, when the sea erodes away the shore in small and imperceptible steps, whether due to rising seas or other natural forces, public ownership advances and private ownership retreats; the boundary between public and private land migrates to match the new location where the mean high water line meets the land.6 Conversely, when wind, wave or currents cause the shore to accrete in small and imperceptible steps, private ownership advances seaward and public ownership retreats to match the new high water line.7 However, when the change in the location of the coastline occurs as a result of an “avulsive” (or sudden) event, the boundary line remains unaltered and the own-

5. See SAX ET AL., supra note 3, at 533. In a handful of states, ownership of private uplands extends to the low water mark. Id.
6. Id. at 535.
7. Id.
er, at least as a matter of property law, has the privilege to take steps to restore the physical boundary line to conform to the legal line. Several rationales have traditionally been offered for the established legal doctrine. The first is that these rules generally facilitate the easy identification of property boundaries for coastal properties; if the extent of a coastal parcel shrinks or expands as a result of natural forces, the owner, potential trespassers, and public authorities can all identify the migrating boundary line by visual inspection. Another rationale is that the rules protect owners’ expectations, in the sense that a coastal property owner will normally hope and anticipate that she will remain a coastal property owner, an outcome facilitated by an ambulatory boundary. Finally, the traditional rules are generally regarded as fair because different owners are deemed equally likely to either gain or lose property as a result of a migrating shoreline; in other words, some owners may gain property while others lose property as a result of changes in the coastline, but all owners face an equal risk when they purchase their properties of losing or gaining property.

The traditional legal doctrine is arguably well-suited to facilitate adaptation to climate change and sea level rise. As sea levels rise (by as much as several feet over the next century, according to some estimates), substantial areas of land will be eroded and inundated. So long as these expected incursions by the sea proceed in small and imperceptible steps, the traditional legal doctrine will support the orderly and predictable landward movement

8. Even if land submerged by the seas as a result of some avulsive event remains private property, it is still subject to regulation in the public interest. See Pennsylvania Coal Co. v. Mahon, 260 U.S. 393, 415 (1922) (stating that regulation of private property will only be held to be a taking if it “goes too far”). Moreover, the (currently) submerged character of the land is certainly one factor regulators can properly consider in determining how the owner may use the property and subject to what terms and conditions.

9. Sax et al., supra note 3, at 535.


11. Id. at 312-13.

12. Cnty. of St. Clair v. Lovingston, 90 U.S. 46, 69 (1874) (“The owner takes the chances of injury and of benefit arising from the situation of the property. If there be a gradual loss, he must bear it; if, a gradual gain, it is his.”). Another somewhat dated explanation for the traditional rule is based on the rule of “natural increase,” which assigns ownership of new born animals to the owner of the parent animal; by like reasoning, ownership of accreted land is said to “rest[] in the law of nature.” Id.

13. See Justin Gillis, Rising Sea Levels Seen as Threat to Coastal U.S., N.Y. TIMES, Mar. 13, 2012, http://www.nytimes.com/2012/03/14/science/earth/study-rising-sea-levels-a-risk-to-coastal-states.html?_r=0 (describing recent studies reporting the sea level is rising at a rate of approximately one foot per century, but “many scientists expect a further acceleration as the warming of the planet continues”).
of coastal boundaries over the next century and possibly beyond. The disruption to private property interests as a result of sea level rise will no doubt be enormous. But, taking an optimistic view, the traditional legal doctrine appears to be well-suited to facilitate the kind of adaptation by coastal property owners demanded by the novel challenge of sea level rise.

There are, however, at least two arguments against applying the traditional legal doctrine in the era of climate change. The first is that one of the premises underlying the traditional legal rule is no longer operative. As discussed, one of the rationales for the traditional rule is that it meets the test of fairness because property owners are equally likely to gain or lose property as a result of a shifting coastal boundary. In the era of climate change, however, sea level is only expected to rise, and to rise significantly, with the result that the movement of coastal boundaries will be essentially unidirectional, consistently moving landward. Given that the premises for the traditional erosion rule that the shoreline may move in either direction no longer applies in the era of climate change, it can be argued that the courts should consider adjusting the common law rule to eliminate ambulatory legal boundaries. For example, one can plausibly anticipate that some coastal landowners will argue that if there is no realistic possibility that they can gain property at public expense through accretion, they should no longer be forced to give up their private ownership to the public through erosion.

Another argument against applying the traditional legal doctrine is that coastal erosion due to sea level rise should itself be analogized to an avulsive event. One could take the view that chronic coastal erosion due to climate change, whether it proceeds imperceptibly or suddenly on a day to day basis, is, in a larger picture sense, avulsive in nature because it is the result of the unique, human-caused global warming phenomenon. Under this view, applying the traditional legal rule applicable to avulsion, the property boundary should not migrate because the rising seas are a result of avulsive climate change.

One potentially persuasive response to this argument is that treating the coastal boundary as fixed could create uncertainty and generate conflicts over the location of the legal boundary. This problem is inherent in the doctrine governing avulsive changes in the coastline; under the avulsion rule, there is routinely a disconnect between the location of the legal boundary and the location of the physical shoreline. But treating all the changes in the location of the shoreline in the era of climate as avulsive would enormously expand the geographic scope of this problem.
Time will, of course, tell how the courts respond to these arguments, but I am inclined to believe that most courts will be slow to reject the traditional doctrines of accretion and erosion. As discussed, sea level will rise and the migration of the shoreline generally will be unidirectional in the era of climate change. But for a variety of reasons related to localized weather patterns or coastal morphology, migration of the shoreline will not always be in the landward direction. The potential for at least some claims by landowners that they have gained accreted lands, and the likely judicial willingness to continue to embrace such claims, will discourage courts from embracing the principle suggested above that landowners can never lose private property ownership as a result of erosion due to rising seas. In addition, the important practical function of the traditional rule in normally fixing the legal boundary at the physical water line will probably continue to have considerable appeal for many courts. Thus, courts will be reluctant to accept that climate change dictates a change in the traditional law regarding coastal boundaries under which the physical and legal boundary of physical property along the coast would almost never coincide. In any event, at least pending relatively revolutionary change in the traditional doctrine governing coastal boundaries, one can fairly assume that coastal legal boundaries will continue to migrate landward as sea levels rise.

III. THE MILNER CASE AND THE ISSUE OF OWNERSHIP OF DEFENDED COASTAL LANDS

The Ninth Circuit’s Milner decision makes the issue of migrating boundary lines even more interesting and challenging because it raises the question of who should own the lands that, applying the traditional rules, would have become submerged public lands as a result of sea level rise but remain dry land because they are behind coastal defense structures.

The Milner case arose from a somewhat unusual conflict between homeowners residing on coastal properties in the state of Washington and the adjacent tidelands owner. All of the lands at issue were originally included within the bounds of a reservation established for the Lummi Indian Nation. The coastal uplands were divided into lots and patented by members of the tribe; the plaintiffs in the Milner case held parcels derived from these patents. The United States owned the adjacent tide-

15. Id. at 1181.
lands in trust for the Lummi Nation.\textsuperscript{16} Under the Equal Footing Doctrine, the states are generally deemed to have acquired title to all or virtually all lands under navigable waters upon their admission to statehood.\textsuperscript{17} In this case, however, the Ninth Circuit ruled that the United States expressly reserved ownership of the tidelands within the reservation down to the low water mark, and therefore these particular tidelands did not pass into state ownership when Washington became a state.\textsuperscript{18} At the conceptual level, the logic of the \textit{Milner} decision appears to apply equally to all coastal boundaries, regardless of whether the tidelands are owned by the United States or, as will more usually be the case, by the state.

In the face of serious erosion problems, the homeowners constructed “shore defense structures” (consisting of “rip rap,” large boulders, and bulkheads) in front of their homes.\textsuperscript{19} While the structures were apparently originally constructed landward of the mean high water mark, by the time the litigation began erosion had brought the water to the face of the structures.\textsuperscript{20} For several decades the homeowners entered into leasing arrangements with the Lummi Nation for use of the tidelands to maintain their coastal defenses, but for some unexplained reason the homeowners eventually declined to renew the leases.\textsuperscript{21} After unsuccessful informal efforts to resolve the dispute, the United States filed suit alleging, among other things, that the homeowners’ maintenance of the defense structures on the tidelands in the absence of an agreement with the tribe constituted a trespass.\textsuperscript{22}

The Ninth Circuit, affirming a decision by the Federal District Court for the Western District of Washington, held that the homeowners were liable for trespass.\textsuperscript{23} The Court recognized that the homeowners had a right under the common law to erect structures on their own land to protect against erosion.\textsuperscript{24} At the same time, the Court ruled that an owner of a coastal property “must accept that the property boundary is ambulatory,” and that the tidelands owner, in this case the United States, has “a vested right to gains from the ambulation of the boundary.”\textsuperscript{25}

\begin{footnotes}
\footnote{16. \textit{Id}. at 1186.}
\footnote{17. \textit{Shively v. Bowlby}, 152 U.S. 1, 49 (1894).}
\footnote{18. \textit{Milner}, 583 F.3d at 1183-86.}
\footnote{19. \textit{Id}. at 1181.}
\footnote{20. \textit{Id}. at 1181, 1190.}
\footnote{21. \textit{Id}. at 1181.}
\footnote{22. \textit{Id}.}
\footnote{23. \textit{Id}. at 1190.}
\footnote{24. \textit{Id}. at 1186.}
\footnote{25. \textit{Id}. at 1186-87.}
\end{footnotes}
cordingly, the Court rejected the homeowners’ argument that, once a coastal defense structure is in place, “the boundary becomes fixed and remains so unless the tide line overtops the structure[ ] or recedes.” Instead, the Court said, the homeowners had “no defense to a trespass action because they are seeking to protect against erosion,” suggesting that the United States was entitled to claim ownership of all those lands that would have become inundated but for the erection and maintenance of the coastal defense structures.

While the dispute in Milner involved a fairly small area of land, the decision has potentially far-reaching implications. As highlighted by one of the amici who unsuccessfully urged the Supreme Court to review the decision in Milner, “[m]ajor urban centers across the nation, such as New Orleans, Seattle, and San Jose, for example, are protected from erosion and inundation by a system of levees and seawalls.” The implication of the Milner decision is, apparently, that many long-time private property owners in these urban areas are exposed to trespass actions. With the prospect of significant sea level rise over the next century and beyond, many more property owners in these and other urban areas protected by coastal defense structures will likely find their private property ownership thrown into doubt.

Whether Milner was correctly decided is not free from doubt. First, as previously discussed, Milner is an unusual case because the tidelands were owned by the United States and not, as will usually be the case in this type of boundary contest, by the state. Although the matter is not completely clear from the Court’s opinion, the Ninth Circuit apparently believed that, because the case involved lands assertedly owned by the federal government (for the benefit of the Lummi), the location of the boundary between public and private ownership presented an issue of federal law. The Court expressly said that the plaintiff’s trespass claim was governed by federal common law, and at least implicitly treated the issue of the boundary between the private uplands and the U.S. owned tidelands as presenting a federal law question as well. However, in the typical case dealing with the competing claims by a citizen and her own state to the boundary of a navigable waterway, state law will govern

26. Id. at 1188-89.
27. Id. at 1190.
29. 583 F.3d at 1182.
the issue. Thus, *Milner* likely represents no more than potentially persuasive precedent for the many different coastal states that will eventually have to confront the boundary question addressed in *Milner*. Moreover, the fact that the issue is one of state law means that different states may well come to different conclusions about the validity of the holding in *Milner*. Given the grave threat to the nation’s economy and ecological systems due to rising seas, one might ask whether this boundary question should be governed by a uniform national rule. However given the entrenched nature of state law property boundary rules, it is probably appropriate to assume that state law will continue to govern in this area.\(^{32}\)

Second, the ruling in *Milner* is debatable on its merits. The position of the homeowners was that lawfully erected shore defense structures that succeed in holding back the sea should be regarded as holding back the advance of the legal boundary as well.\(^{33}\) Their argument focused on the potential disruptions to established claims of coastal property ownership, especially in urban areas, if the United States’ theory was adopted.\(^{34}\) Another possible argument in their favor might have been that the Ninth Circuit ruling separates the legal boundary from the actual physical boundary as determined by coastal defense structures; as discussed above, the traditional rule regarding ambulatory coastal boundaries has been justified, in part, based on the desirability of keeping the legal boundary coincident with the actual physical boundary. Applying the same reasoning in *Milner* would have supported the conclusion that a lawful coastal defense structure should be treated as fixing the legal boundary, at least temporarily.

On the other hand, the homeowners cited remarkably little authority to support their position, suggesting that the Ninth Circuit had considerable leeway to craft its new rule. The ruling in *Milner* can be defended as protecting the public’s legitimate expectations of gaining title to lands that become submerged. The mere fact that the government may have acquiesced in the construction of coastal defense structures, whether initially built on private or public property, should not be constructed as a

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31. See Stop the Beach Renourishment, Inc. v. Fla. Dep’t of Envtl. Prot., 130 S. Ct. 2592, 2597 (2010) (“Generally speaking, state law defines property interests, including property rights in navigable waters and the lands underneath them.” (citations omitted)).


33. 583 F.3d at 1188-89.

legal forfeit of the extensive public property rights at stake. Importantly, the Ninth Circuit ruling does not cast any doubt on the wisdom or legality of defense structures designed to arrest the rising sea; rather, it merely speaks to the issue of the ownership of the lands behind coastal defenses.\(^\text{35}\)

In sum, while the conclusion is certainly not irrefutable, there is a substantial argument Milner is good law, and that the ruling will eventually be embraced by various state courts. Accepting this premise, how should the government address the challenges of managing these new publicly owned lands? These challenges are myriad.

IV. THE LAND MANAGEMENT CHALLENGES BEHIND COASTAL DEFENSE STRUCTURES

An important threshold issue is the precise nature and scope of the government’s ownership rights in lands behind coastal defense structures. As discussed, Milner indicates that the public title in submerged lands should extend through and beyond a coastal defense structure to the point on the land that the sea would reach if the coastal defense structure did not exist. But this simple statement of the holding in Milner raises several subsidiary questions.

First, is the nature of the public ownership of lands behind coastal defense structures the same or different from its ownership of lands that are actually submerged by coastal waters? Courts have recognized that as coastal lands erode and the shoreline migrates landward, the public ownership of submerged lands migrates landward along with the receding shoreline.\(^\text{36}\) It is only natural to presume that the nature and character of the public title to submerged lands is the same regardless of whether the lands have long been submerged or only became submerged relatively recently. Moreover, under the logic of Milner, if the limit of public ownership extends to the point where the sea would reach in the absence of a coastal defense structure, then, every-

\(^{35}\) The United States Supreme Court denied the petition for certiorari, despite the homeowners’ argument that the ruling “will have dramatic impacts along the coastline” and that it puts “large areas of reclaimed land” in many cities “at risk of being claimed by the tideland owner.” Petition for Writ of Certiorari, supra note 34, at 13-14. See also Brief for Pacific Legal Foundation et al., supra note 28, at 9-10. The Court may have been influenced by the United States’ argument in opposition to the petition that the case had limited significance given that the legal boundary between upland and tideland owners is typically governed by state law rather than federal law. It is possible that Milner will turn out to be a rare, possibly one-time federal court excursion into a topic ordinarily governed by state law and decided by state courts. If so, the United States Supreme Court may not have another opportunity soon to weigh in on this issue.

thing else being equal, the nature and character of the public ownership should presumably remain the same in the area behind a coastal defense structure as well.

But it might be argued that everything is not equal and that there is an important distinction between actually submerged lands and lands that could be submerged but are not, in fact, submerged. In particular, at least where a coastal defense structure has been constructed with government approval, it might be contended that the government authorization represents a ceding of any claim of public ownership in the protected area. In the landmark case of Phillips Petroleum Co. v. Mississippi, the Supreme Court recognized that a state’s ownership rights in submerged lands under the Equal Footing Doctrine extend to all areas subject to the ebb and flow of the tide. At the same time, the Court indicated that the government need not necessarily retain ownership of all those areas to which it can lay claim, observing that “many coastal States, as a matter of state law, granted all or a portion of their tidelands, to adjacent upland property owners long ago,” and that the decision did “nothing to change ownership rights” in tidelands which the states previously conveyed to private parties. Applying Phillips, it could be contended that a government decision to authorize a coastal defense structure represents a government decision not only to protect the area from inundation, but to waive any claim to public ownership of the area. While hardly implausible, the argument faces the difficulty that a public decision to authorize a defense structure does not logically imply that the government also intends to forfeit public property rights. At least absent an express official statement to the contrary, it would appear inappropriate to read a property rights transfer into an authorization for a coastal defense structure.

Furthermore, even an express transfer of ownership rights in the area behind a coastal defense structure into private hands probably would not encompass public trust interests related to navigation, fisheries, or ecological conservation. In the seminal case of Martin v. Wadell, the Supreme Court rejected the plaintiff’s claim of an exclusive fishery in submerged coastal lands in New Jersey on the ground that the King of England, the asserted

37. 484 U.S. 469 (1980).
38. Id. at 476.
39. Id. at 483. See also PPL Montana, LLC v. Montana, 132 S.Ct. 1215, 1219 (2012) (observing that, once a state has acquired submerged lands under the Equal Footing doctrine, “[i]t may allocate and govern those lands according to state law subject only to the United States’ power ‘to control such waters for purposes of navigation in interstate and foreign commerce.’”) (citation omitted).
source of the grant, lacked the power “to grant to a subject a portion of the soil covered by the navigable waters of the kingdom, so as to give him an immediate and exclusive right of fishery, either for shell-fish or floating fish, within the limits of his grant.”

In other words, “[a]s trust resources, their public benefits were inalienable in principle.” Subsequent case law has generally reaffirmed this view, permitting the alienation of public trust lands only when necessary to promote public trust purposes, such as for development of a port, or where the effect of public trust resources is de minimis. The issue is largely, if not exclusively, governed by state law.

In light of these authorities, it appears reasonable to conclude that, assuming Milner was correctly decided, and assuming there are no other exceptional circumstances, public rights in lands behind coastal defense structures might well be regarded as equivalent to traditional public rights in submerged lands. Given this premise, how then should the public proceed to manage these lands?

It is important to recognize at the outset that the challenge of managing the area behind coastal defense structures presents a dynamic problem. Some, perhaps many, coastal defense structures will likely arrest the rising sea due to climate change for substantial periods of time. But as sea levels continue to rise higher and higher and the cost of maintaining and strengthening defense structures spirals upward, neither private parties nor the government will be willing to continue to make the investments necessary to keep the sea at bay. As a result, the protection provided by coastal defense structures will, in many cases, turn out to be temporary. The eventual collapse of many coastal defense structures at different points along the coast will have both legal and practical implications.

40. 41 U.S. 367, 410 (1842).
42. See Illinois Central Railroad Co. v. Illinois, 146 U.S. 387, 452 (1892); Borough of Neptune City v. Borough of Avon-by-the-Sea, 294 A.2d 47, 54 (N.J. 1972). But cf. City of Berkeley v. Superior Court of Alameda Cnty., 606 P.2d 362 (Cal. 1980) (recognizing that the state cannot convey public trust lands to private parties free of the public trust, but declining to apply this novel rule retroactively to filled lands that have been rendered “substantially valueless” for public trust purposes).
43. In Stop the Beach Renourishment, Inc. v. Florida Department of Environmental Protection, 130 S.Ct. 2592 (2010), the Supreme Court recently addressed a takings claim arising from state legislation freezing the legal boundary between private uplands and public submerged lands. However, that case, which involved a lawful assertion of government authority to fill submerged public lands, has little or no relevance to the question of whether the government can abdicate its sovereign control over public lands.
From a legal standpoint, under *Milner* the area behind a defense structure is already publicly owned if the area would be submerged by the sea in the absence of the defense structure. Thus, a breach in a defense structure and the resulting inundation of the area behind the structure should generally have no legal consequences. The invading sea will simply intrude upon an area that, by law, is already publicly owned. Under traditional doctrine governing coastal boundaries, the breaching of a defense structure and subsequent rapid inundation of the area behind the structure would ordinarily constitute an avulsive event. But that legal rule has no relevance to lands that, under *Milner*, are already publicly owned. (By contrast, in jurisdictions that reject *Milner* and hold that a defense structure freezes the coastal boundary, the issue of whether the breach of a defense structure might constitute an avulsive event could be significant. Under the traditional doctrine of avulsion, the breaching of a structure and inundation of the area behind the structure generally do not move the boundary between public and private property ownership).\(^{44}\)

From a practical standpoint, the prospect of continually rising seas, capped by likely abandonment of defense structures and subsequent inundation of the areas behind the structures, makes the challenge of managing lands behind such structures particularly difficult. In contrast with more secure uplands that are well above sea level, the uses of land areas behind coastal defense structures will necessarily be limited in duration. Certain private land uses, including intensive development, may be entirely feasible for decades or even centuries in some locations. But those uses will become impractical or infeasible once the area is flooded by the sea. A forward-looking planning approach should presumably take into account the expected life of different kinds of coastal land uses and the potential social, economic, and environmental costs when these uses are flooded out by rising seas. Very capital-intensive developments with long-projected life spans, like public museums, should generally be kept out of areas likely to be abandoned to the sea. Similarly, major public facilities, like major roadways or airports, which would be hard to replace and the loss of which would have widespread effects on the community, should be kept out of sensitive areas. Inundation of certain kinds of facilities, such as landfills or chemical processing plants, could lead to significant, widespread environmental problems which ought to be considered at the time such facilities are initially sited.

\(^{44}\) See SAX ET AL., supra note 3, at 535.
The eventual flooding of areas behind defense structures has the potential to inflict serious losses on homeowners and business located behind such structures. The magnitude of such losses will be significantly affected by the types of insurance held by those living and working behind the structures. Insurance provides a potential means for individuals or firms to recoup all or most of the losses they suffer as a result of an individual inundation event. But insurance coverage is obviously available only for a price. In a rational insurance market, classes of policy makers choosing to expose themselves to particular risks, such as the risk of failure of a coastal defense structure, would pay a higher premium to reflect this special risk. As a result of the notorious National Flood Insurance Program (“NFIP”), however, the general taxpayer has long helped subsidize insurance policies in at-risk coastal areas, creating a perverse incentive for development in such areas.45

The federal policies specifically applicable to areas protected by coastal defense structures are particularly perverse. The federal flood program defines so-called “residual risk areas” as “areas that are ‘behind a levee or near a dam or other flood control structure, and that would be subject to flooding in the base flood if not for the protective structure.’ ”46 The NFIP exempts from its mandatory insurance-purchase policy properties behind flood-control structures, but at the same time offers flood insurance at discounted rates for those who wish to procure such insurance.47 During the recent congressional debate over reauthorization of the NFIP, reform advocates proposed that owners in residual risk areas be required to purchase flood insurance.48 But language to accomplish this goal was not included in the Biggert-Waters Flood Insurance Reform Act of 2012, signed into law by President Obama on July 6, 2012.49 As a result, even communities that are participating in the NFIP are not required to adopt flood-protective land use regulations behind defense structures, and

46. JESSICA GRANNIS, GEORGETOWN CLIMATE CTR., ANALYSIS OF HOW THE FLOOD INSURANCE REFORM ACT OF 2012 (H.R. 4348) MAY AFFECT STATE AND LOCAL ADAPTATION EFFORTS 10 (2012).
47. See 44 C.F.R. § 65.10 (2012) (defining criteria for exempting areas behind defense structures from NFIP mandatory requirements).
48. GRANNIS, supra note 46, at 11.
property owners in such communities are not required to obtain flood insurance as a condition of receiving a federally-backed mortgage in such areas.

The ultimate economic impact of this policy regime when defense structures inevitably fail is hard to predict and will vary from community to community and from owner to owner. For those who purchase flood insurance at discounted rates, the federal taxpayer will effectively provide a significant subsidy for owners’ choices to locate in at-risk areas. Stated differently, under Congress’ current policy, such owners will not be forced to internalize all of the costs of their decisions about where to live and work. Other owners who opt not to obtain insurance may suffer serious losses and be forced to bear the economic brunt of arguably unwise decisions. Yet, as illustrated by the recent response to Hurricane Katrina and the New Orleans levee failures, Congress has a history of stepping in after a disaster to assist even those who lack flood insurance, serving in effect as a cost-free insurer of last resort. As a result, a significant part of the cost of citizens’ choices to live behind vulnerable defense structures will likely be borne by the public.

The problems associated with these policies are relatively easy to discern. The lack of a mandatory requirement to obtain flood insurance will eliminate the modest disincentive provided by the NFIP for individuals not to locate in flood-prone areas. At the same time, this regime will create an incentive for communities to build, or permit the building of, defense structures in order to “protect” their residents from expensive insurance mandates. This latter incentive will be especially strong if the cost of building defense structures can be passed on in whole or in part to the federal government.

What are the implications of the Milner decision for public land management decisions affecting areas behind defense structures? If and when a structure fails, the policy options are fairly limited and straightforward. For the reasons discussed above, under Milner formerly private lands behind coastal defense structures will already have been converted to public ownership as a result of sea level rise. When the areas eventually flood, state governments could aggregate the management of these newly submerged lands with the rest of its submerged lands estate. Potential private uses of these lands, whether for oil and gas extraction or aquaculture, for example, could be permitted and otherwise managed under the pre-existing regimes governing such private uses of publicly owned submerged lands. Significant legal disputes will no doubt arise about the enforceability of
the legal responsibility of former occupants of these lands to remove ruined structures from what are now fully submerged lands.

The more interesting and difficult question is how the government should govern formerly private lands that remain secure (at least for the time being) behind a coastal defense structure. Because, under Milner, each state will own the lands that would be inundated if not for the existence of the defense structure, state officials could, like the United States in Milner, sue in trespass. Applying traditional legal doctrine, once government title migrates landward, the state becomes the owner of the land and the prior owner loses ownership. While the prior private owners will not have engaged in aggressive trespass, in the sense that they affirmatively located some private structure on private land in defiance of the true owners’ wishes, they still will be vulnerable to suit for a trespass. As the Milner decision explains, it is sufficient, to establish a prima facie case of trespass, for the actual owner to demand that an individual remove himself or his possessions from the owner’s land; if he refuses, the owner is entitled to sue in trespass.

The larger policy question is when, if ever, should the government wish to exercise its legal right to require prior private owners to remove themselves, their structures, and their belongings from land that formerly belonged to them. One possibility would be a government determination that, notwithstanding the existence of the defense structure, the area behind the structure is too risky for human habitation. Another possibility would be a determination that the community would benefit if the area were allowed to revert to nature. One of the myriad challenges posed by rising seas due to climate change is that ecologically valuable intertidal ecosystems, tidal salt marshes in particular, will be under enormous pressure as a result of a combination of hardened shores (preventing landward eco-system migration) and rising seas (eliminating tidal effects). A sensible policy response to rising seas is to actively develop opportunities for ecosystems to become reestablished further inland. Areas that would be subject to tidal influence but for the existence of coastal defense structures are, at least in geomorphic terms, perfect poten-

50. See supra text accompanying note 2.
51. United States v. Milner, 583 F.3d 1174, 1190-91 (9th Cir. 2009) (“A trespass may be committed by the continued presence on the land of a structure, chattel, or other thing that the actor or a predecessor in legal interest has placed on the land and failed to remove.” (citing RESTATEMENT (SECOND) OF TORTS § 161 (2009); 75 AM. JUR. 2D Trespass § 19 (2009)). See also RESTATEMENT (SECOND) OF TORTS § 158 (2012) (“One is subject to liability to another for trespass, irrespective of whether he thereby causes harm to any legally protected interest of the other, if he intentionally . . . remains on the land, or . . . fails to remove from the land a thing which he is under a duty to remove.”).
tial sites for such coastal restoration efforts. Since the target restoration area would, by definition, be below mean high water, it would be relatively easy as an engineering matter to permit the sea to circumvent and erode the coastal defense structure and reclaim the land.

Because the relevant state, under Milner, already owns the lands behind coastal defense structures, there is no need for the state to exercise the power of eminent domain, or pay “just compensation” pursuant to the Fifth Amendment, in order to reclaim what are already public lands. Putting legal principles aside, however, this type of assertion of public ownership rights might well generate considerable political opposition. Indeed, from the public’s perspective, a forthright exercise of the eminent domain power might actually be preferable, not least because an exercise of eminent domain must be accompanied by payment of financial compensation. Furthermore, owners within targeted areas could be expected to form coalitions to oppose public use of the lands behind defense structures. Faced with the prospect of losing “their” property, without even the consolation of receiving “just compensation,” some former owners can be expected to be particularly vigorous in their advocacy.

In other cases, the most sensible government policy may be to leave current land uses and prior owners in place. The buildings behind a coastal defense structure represent a sunken investment that may well have considerable economic value, even if it must be discounted to take account of the threat posed by the rising sea. The community created by residential and commercial owners in the area behind a defense structure will also usually represent a social asset of considerable value. This economic investment and social capital might be lost if and when the decision is made to surrender to the sea. The high cost of building and rebuilding coastal defense structures, as well as the ever increasing threat of catastrophic failure as sea level rises, will make it prudent for society to decide, in certain instances, that some areas cannot be defended any longer. But those decisions will be very difficult, and in many—if not most—instances society will justifiably seek to forestall them for a lengthy period of time.

There remains, however, the problem of how government should administratively manage the public’s coastal lands behind defense structures even if they continue to be occupied by the former private owners (or other private owners). One approach, and probably the approach being followed in some jurisdictions already seeing the early effects of sea level rise, is to turn a blind eye to the fact of public ownership and to continue to treat these
areas as if they were held in private ownership. This represents the path of least resistance from a political and policy standpoint. From a landowner standpoint, this course is attractive because it allows the owner to continue to enjoy the basic attributes of property ownership, including the right to exclude third parties and to decide (subject to regulatory reviews) how the property will be developed and redeveloped. From a local government standpoint, this option is also likely to be attractive, not only because it will generate the least political controversy, but because it will allow the local governments to continue to reap tax receipts from private landowners as they have in the past. Recognizing that formerly private lands are now public lands would, at a minimum, unsettle the local property tax regime and could adversely affect local government tax revenues.

Notwithstanding the appeal of this status quo approach, there is a strong case to be made for the government explicitly asserting its new ownership interest in lands behind coastal defense structures. The clear public interest in maintaining accurate and orderly land records argues for publishing (and not simply ignoring) clear information about public ownership of coastal lands. Milner also suggests that it would be logical to switch, with respect to properties that have passed from private to public ownership due to sea level rise, to a system of government leasing to private parties. The Milner case involved a dispute about whether the former owners had to make lease payments in order to continue to use the property. At least as a default, the lease payments could be set at a rate that corresponds to the levels the former owners paid in the form of local property taxes. Thus, recognition of the transition from private to public ownership could be accomplished in a relatively seamless and straightforward fashion.

There appear to be other significant policy and administrative advantages to forthrightly recognizing the fact of public ownership of coastal lands. A leasehold arrangement would firmly place in the hands of state government, as the landlord, control over decisions about whether to expand a property or to rebuild a property following storm damage. Even in the face of climate change overbuilding along the coast remains a serious problem; increased direct state ownership and control of the most vulnerable coastal properties could help mitigate this problem. One of the more controversial features of the NFIP is the problem of so-called “repetitive loss” properties which have been repeatedly flooded and on which insurance payouts have been made.

52. 583 F.3d at 1190.
repeatedly, with the total payments sometimes far exceeding the entire value of the structures.\textsuperscript{53} Congress might be more willing to finally clamp down on repetitive loss payments if the properties were owned by state governments rather than individual homeowners. Finally, leases, presumably with a fixed expiration date, might reify for coastal residents the fact that the ultimate decision about whether to occupy at risk coastal properties is for the public, helping to set the stage for a deliberate, long-term retreat from the coast in the face of a rising sea.

V. CONCLUSION

Sea level rise due to climate change presents significant theoretical and practical challenges for the traditional property law regime governing the coastal boundary between public and private ownership. The Ninth Circuit’s \textit{Milner} decision suggests that the extent of public land ownership along the coast can and should expand in response to sea level rise. Sooner rather than later, state governments need to rise to the challenge of how they will administer these new public lands.