

Adapting to Climate Change on the Oregon Coast: Lines in the Sand and Rolling Easements

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* J.D. *cum laude* Lewis & Clark Law School 2007. Staff Attorney at Crag Law Center, Courtney coordinates the Coastal Law Project, a collaboration with Oregon Shores Conservation Coalition addressing land use issues in Oregon’s coastal communities. Key cases include: *Oregon Shores Conservation Coal. v. Bd. of Comm’rs of Clatsop Cnty.*, 249 Or. App. 531 (2012); *Oregon Coast Alliance v. Curry Cnty.*, 63 Or. LUBA 324 (2011); *Baxter v. Coos Cnty.*, 58 Or. LUBA 624 (2009).

** Of Counsel to Black Helterline LLP; Organization Counsel for Oregon Shores Conservation Coalition (OSCC) (1971); Commissioner on Oregon’s first Land Conservation and Development Commission (1973–1976); Litigated *Oregon Shores Conservation Coal. v. Lincoln Cnty.*, 164 Or. App. 426, 992 P.2d 936 (1999) (Counsel for OSCC in Yachats 804 South Trail matter) and *Oregon Shores Conservation Coal. v. Oregon Fish & Wildlife Comm’n*, 62 Or. App. 481, 662 P.2d 356 (1983) (Oyster Grower Pesticide Use in Tillamook Bay); Council Member on the Oregon Energy Facility Siting Council (1990-1998); member of Governor’s Ted Kulongoski’s 2004 Advisory Group on Global Warming, whose report can be found at: <http://www.oregon.gov/energy/GBLWRM/docs/GWReport-Final.pdf>. We greatly appreciate several of our friends, colleagues, and critics who have taken time to review and comment on drafts of this paper, including Michael Blumm, Steven Bender, Curt Peterson, Jeff Weber, and Laren Woolley. Their comments have been most helpful in clarifying our thinking. Of course, we take full responsibility for the final product.

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“No local selfish interest should be permitted, through politics or otherwise, to destroy or even impair this great birthright of our people.”

– Oswald West

INTRODUCTION

Climate change threatens the customary rights of Oregonians to use, play, and recreate on the State’s beaches. A sea level rise of three feet will result in narrowing certain sandy beaches by as much as six hundred feet in width.¹ Hardening the shores, by using riprap and other means, results in loss of sand on the beaches. There are no post-disaster plans in place for deciding what roads, sewers, and water systems not to replace when the sea seeks to claim low-lying areas of development.² While mitigating the causes of climate change remains essential, Oregon’s land use system needs to concentrate on adaptation and to revise its goals, statutes, and processes to preserve and protect its beaches.

Climate change adaptation is causing a reevaluation of planning and land use decisions all across the world. A recent survey reports that “[m]ore than 4 out of 5 Americans want to prepare now for rising seas and stronger storms from climate change.”³ The State of Oregon in the United States of America is not alone in rethinking how climate change adaptation will affect its coasts. The process entails reflection on how property boundaries and the “bundle of rights” associated with the uses of private property are to be determined going forward and what requirements are appropriate for private property affected by climate change. This paper provides a framework discussion of property rights, land use, and natural hazards planning as they have evolved so far in Oregon and where we might be headed given projected and current changes along our coast. In Part I, we establish

¹ Curt Peterson, *Impacts of Predicted Global Sea Level Rise on Oregon Beaches*, in ADAPTING TO CLIMATE CHANGE ON THE OREGON COAST 11, 13 (2012), available at <http://oregonshores.org/pdfs/EducationalPacket.pdf>.

² Oregon Parks and Recreation Department, which is in charge of permits, recognizes these problems but wants more study before it takes any definitive actions. See OR. PARKS & RECREATION DEP’T, CLIMATE CHANGE RESPONSE PREPAREDNESS AND ACTION PLAN (2010), available at http://www.oregon.gov/oprd/NATRES/docs/oprdclimatechangeplan_forcommission_forweb.pdf.

³ Seth Borenstein, *Poll: Americans Oppose Paying for Storm-ravaged Beaches*, PORTLAND PRESS HERALD (Mar. 29, 2013), http://www.pressherald.com/news/most-in-poll-oppose-projects-to-thwart-rising-seas_2013-03-29.html.

the background legal framework of the public trust doctrine, Constitutional takings, and the current state of the case law relevant to these issues. Part II provides an overview of various boundaries and uses currently existing on Oregon's coastal zone. Part III discusses the unique physical elements Oregon must deal with in considering adaptation to climate change and how Oregon's boundaries and uses in the coastal zone are and will be affected by climate change. Part IV evaluates options for rolling and ambulating lines and easements. Part V focuses on which and why boundaries and uses on Oregon's coast are likely to ambulate or roll.⁴ Finally, we provide some suggestions for adaptation on Oregon's coast arising out of climate change. Our discussion frames these issues in terms of "lines in the sand;" in other words, where can we begin to measure public and private property lost to rising seas and intensified storm surge? At the intersection of land use planning and property rights, can we find a path to prevail against the challenges of climate change?

I

A SHORT HISTORY OF PROPERTY BOUNDARIES AND RIGHTS RELEVANT TO OREGON'S COAST

At least since the Enclosure Laws came about in England,⁵ the law has recognized fixed boundaries for ownership of private property. These boundaries are fixed by surveyors through metes and bounds descriptions or lines on a plat map that can be located on the ground. A key right in the "bundle of property rights" is the ability to exclude others. Land planning and use restrictions modify the uses that may be made of property, most usually based on the idea that activities anticipated on the property will have effects outside of the property.

⁴ An ambulatory line is one that moves forward or backward with the changes that occur. JAMES G. TITUS, CLIMATE READY ESTUARIES PROGRAM, EPA, ROLLING EASEMENTS 58 (2011), available at http://water.epa.gov/type/oceb/cre/upload/rolling_easementsprimer.pdf. "A rolling easement is a legally enforceable expectation that the shore or human access along the shore can migrate inland instead of being squeezed between an advancing sea and a fixed property line or physical structure." *Id.* at 5–6.

⁵ Enclosure resulted in excluding those using common areas (i.e., "commoners") such as pastures and fens (i.e., wetlands), and these commoners became foot soldiers in the revolt led by Cromwell against King Charles I of England. *Cf.* Ford Runge and Edi DeFrancesco, *Exclusion, Inclusion and Enclosure: Historical Commons and Modern Intellectual Property*, 34 WORLD DEV. 1713–1727 (2006), available at <http://faculty.apec.umn.edu/frunge/documents/Exclusion,Inclusion%20and%20Enclosure.pdf>.

However, when land meets water, the lines of property law tend not to be so fixed.⁶ At common law, reliction⁷ is the idea that a gradual washing away of the soil or rising of water on the shore moves the line of ownership and the ability to exclude others, resulting in a decrease of the area of private property.⁸ Similarly, accretion⁹ moves the line of ownership further down the shore and increases the amount of property. However, avulsion,¹⁰ a sudden change in the course of the water, will not change the ownership. As where a river oxbow is cut off suddenly by a flooding event, thus leaving an island, the island remains in the ownership of the person who held the land before the sudden change.

Within the United States, property and rights associated therewith generally are matters of state, not federal, law. However, there are two significant limits to states' jurisdiction: (1) the public trust doctrine, and (2) the constitutional requirement that there be no takings of private property for public use without payment of just compensation. Common law doctrines under United States legal traditions can be clarified, modified, made more detailed, and ultimately even changed by constitutions, statutes, and their judicial interpretations. In addition, while courts of one state are not bound by decisions of courts in other states, their opinions are frequently informed by decisions from other states. Thus, it is necessary to examine any analysis of lines and uses of property in the context of the following federal law and possibly relevant law of other states.

⁶ See, e.g., OR. REV. STAT. § 93.310(5) (2011) ("When tidewater is the boundary, the rights of the grantor to low watermark are included in the conveyance, and also the right of this state between high and low watermark.").

⁷ A standard definition of reliction is: "A process by which a river or stream shifts its location, causing the recession of water from its bank. . . . The alteration of a boundary line because of the gradual removal of land by a river or stream." BLACK'S LAW DICTIONARY (9th ed. 2009).

⁸ However, Oregon has chosen to provide some limitations to this doctrine: "No person shall acquire any right, title or interest in or to the submersible and submerged lands of any such navigable lakes, or any part thereof, by reliction or otherwise, or by reason of the lowering or drainage of the waters of such lakes, except as provided by statute." OR. REV. STAT. § 274.025(2) (2011).

⁹ A standard definition of accretion is: "The gradual accumulation of land by natural forces, esp. as alluvium is added to land situated on the bank of a river or on the seashore." BLACK'S LAW DICTIONARY (9th ed. 2009).

¹⁰ A standard definition of avulsion is: "A sudden removal of land caused by change in a river's course or by flood." BLACK'S LAW DICTIONARY (9th ed. 2009).

A. *The Public Trust*

In Justinian's Institutes, what became the "*jus publicum*" is phrased as follows:

[T]he following things are by natural law common to all—the air, running water, the sea, and consequently the sea-shore. No one therefore is forbidden access to the sea-shore, provided he abstains from injury to houses, monuments, and buildings generally; for these are not, like the sea itself, subject to the law of nations.¹¹

The public trust doctrine grants the public reasonable access to common resources. This principle was embodied in American law by a case in which the United States Supreme Court prohibited the State of Illinois from transferring a portion of Lake Michigan to a railroad.¹² Since before the American Revolution, states have owned the beds of navigable waters. Oregon gained similar ownership when it entered the United States in 1859 under the doctrine of "equal footing."¹³ In Oregon, the "public trust" has been recognized not only for navigation, but also for fisheries and public recreation.¹⁴ ORS 390.610(1) provides that "it is the public policy of the State of Oregon to forever preserve and maintain the sovereignty of the state heretofore legally existing over the ocean shore of the state . . . so that the public may have the free and uninterrupted use thereof."¹⁵ However, the public trust uses for navigation, fisheries, and public recreation are not absolute. In 1979, the Oregon Supreme Court held that, upon proper findings, an airport runway could be built into the "waters of this state," in this case the Pony Slough in Coos Bay, even though this use was not for navigation, fisheries, or public recreation.¹⁶ However, even there, the runway extension was part of a transportation system, which bears some overlap with the concept and purposes of navigation. In any case, public rights of use must be balanced with private property rights.

¹¹ THE INSTITUTES OF JUSTINIAN, at bk. 2, tit. 1 (J.B. Boyle trans., Oxford, 5th ed. 1913), available at http://webu2.upmf-grenoble.fr/DroitRomain/Anglica/just2_Moyle.htm.

¹² Ill. Cent. R.R. Co. v. Illinois, 146 U.S. 387 (1892).

¹³ State *ex rel.* State Land Bd. v. Corvallis Sand & Gravel Co., 283 Or. 147, 151, 582 P.2d 1352, 1355 (1978) ("When additional states were admitted to the union, they were admitted on an equal footing with the original states and, therefore, they also acquired title to the beds of their navigable waters except any portions which had passed into private ownership prior to statehood.")

¹⁴ OR. REV. STAT. § 541.610(1) (2011); Morse v. Or. Div. of State Lands, 285 Or. 197, 203–04, 590 P.2d 709, 712 (1979).

¹⁵ OR. REV. STAT. § 390.610(1) (2011).

¹⁶ Morse, 285 Or. at 213, 590 P.2d at 719.

B. Takings

Under the Constitution of the United States, private property cannot be taken for a public use without just compensation paid to the owner.¹⁷ The U.S. Supreme Court has on many occasions ruled on the nature and extent of the takings doctrine, and it has determined that the clause requires payment of compensation to landowners where regulations eliminate all economic value of a property by restricting development rights, i.e., a total taking.¹⁸ In the instance where a regulation causes only a diminution of economic value, the Court established a multifactor test to determine whether compensation is due based on the particular circumstances of the case, including (1) a regulation's economic impact on the landowner, (2) the extent to which it interferes with investment-backed expectations, and (3) the character of the government's action.¹⁹ Thus, in considering what might be required of ocean-front landowners in responding to climate change impacts, the takings doctrine must inform a government's decisions regarding how to regulate in a manner that does not violate this Constitutional right. The following three sections help in understanding the scope of the Court's doctrine regarding regulatory takings.

1. Total Taking—Lucas—40-Year Erosion Line

In South Carolina, David Lucas bought two vacant lots on the coast; they were located between existing homes and were separated by a lot with an existing house.²⁰ Subsequent to Mr. Lucas's purchase, but before he constructed homes on the properties, the South Carolina Legislature adopted the Beachfront Management Act, which prohibited construction of buildings within twenty feet landward of a "base line" to be established as connecting the erosion points in the last forty years.²¹ The South Carolina Coastal Council examined old maps and records of the beach sand movement in the area and predicted that the beach in front of Mr. Lucas's lots would erode

¹⁷ U.S. CONST. amend. V ("[N]or shall private property be taken for public use, without just compensation.").

¹⁸ *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1030–31 (1992).

¹⁹ *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978) (these factors have become known as the "Penn Central Test.").

²⁰ *Lucas*, 505 U.S. at 1008.

²¹ *Id.* at 1008–09.

away.²² The Council established a no-build line inland from Mr. Lucas's lots before he could build on them.²³ Ultimately, the case went to the U.S. Supreme Court where Justice Scalia opined that the Court has developed two sorts of absolute rules requiring governments to pay compensation for takings: one is for physical invasions and the other is for regulations that deprive the owner of all economically beneficial use.²⁴ However, there is an exception to the compensation for total regulatory takings doctrine where, even though the regulatory taking deprives the owner of all beneficial use, the regulation is merely a codification of a litigable, preexisting public or private nuisance or other limitation.²⁵ In that case, no compensation is owed because the "right" limited by regulation was not one to which the property owner was entitled, that is, the "right" was not "inhere[nt] in the title."²⁶

2. Diminution–Beach Nourishment–Beach Erosion Control Line

Prior to 1986, hurricanes had eroded the sandy beach in front of gulf and ocean front properties of many Floridians.²⁷ Under a 1986 statute, upon a local government request, an agency of the State of

²² CORNELIA DEAN, *AGAINST THE TIDE: THE BATTLE FOR AMERICA'S BEACHES* 200 (1999).

²³ *Id.*

²⁴ *Lucas*, 505 U.S. at 1029.

²⁵ *Id.* The *Lucas* case was sent back to the South Carolina Supreme Court for a review of whether such a pre-existing nuisance existed. On remand, the South Carolina Supreme Court ruled there was a compensable taking. *Lucas v. S.C. Coastal Council*, 424 S.E.2d 484 (S.C. 1992). Subsequently South Carolina bought Mr. Lucas's property and then resold it for development based on a subsequent change that allowed "special permits" for certain development. Eventually, the beach sands did erode, and all of the homes had to be sandbagged for protection. DEAN, *supra* note 22, at 201. Professor Blake Hudson argues that South Carolina should have relied on more than nuisance in the remand; rather, it should have used the public trust as a "background principle." Blake Hudson, *The Public and Wildlife Trust Doctrines and the Untold Story of the Lucas Remand*, 34 COLUM. J. ENVTL. L. 99, 127–28 (2009).

²⁶ *Lucas*, 505 U.S. at 1004.

²⁷ BUREAU OF BEACHES & COASTAL SYS., DIV. OF WATER RES. MGMT., DEP'T OF ENVTL. PROT., *CRITICALLY ERODED BEACHES IN FLORIDA 1* (2012), available at <http://www.dep.state.fl.us/beaches/publications/pdf/critical-erosion-report-2012.pdf>. ("In 1986, pursuant to Sections 161.101 and 161.161 of Florida Statutes, . . . the Bureau of Beaches and Coastal Systems[] was charged with the responsibility to identify those beaches of the state which are critically eroding and to develop and maintain a comprehensive long-term management plan for their restoration. In 1989, a first list of erosion areas was developed based upon an abbreviated definition of critical erosion. That list included 217.6 miles of critical erosion and another 114.8 miles of noncritical erosion statewide.").

Florida was required to fill and maintain the sand in front of an owner's property to the water side of a fixed "erosion control line" which was established permanently as the then mean high water line.²⁸ Further, the act of filling would grant a right of public access to that line. Certain property owners in Florida claimed that fixing such a line took their rights of access to the water and of any future accretions that might attach to their properties. The U.S. Supreme Court characterized the immediate act of the Florida agency's sand deposits for beach nourishment as an "avulsion" (i.e., not merely a slow change, or accretion).²⁹ The Court found that under its pre-existing state law, Florida, not the landowners, had the right to any such avulsion, even if it was caused by the state and even though it cut off the landowners' rights of exclusive access and accretion.³⁰ The Court held that the beach nourishment law did not result in a compensable taking of beachfront owners' property.³¹

3. *Diminution–Palazzolo–Passage of Time*

In *Palazzolo v. Rhode Island*, a company, in which Palazzolo had an interest, submitted an application to the Rhode Island Division of Harbors and Rivers (DHR) in 1962 to dredge a pond and fill the wetlands covering part of the property.³² The application was denied for lack of essential information, and a second, similar proposal was filed a year later.³³ A third application, which proposed more limited filling of the land for use as a private beach club, was submitted in 1966 while the second application was still pending.³⁴ The second and third applications were referred to the Rhode Island Department of

²⁸ *Id.*; FLA. STAT. § 161.161 (2013).

²⁹ *Stop the Beach Renourishment, Inc. v. Fla. Dep't of Env'tl. Prot.*, 130 S. Ct. 2592, 2611 (2010).

³⁰ *Id.* at 2612.

³¹ *Id.* at 2610–13. *Stop* is a careful application of *Lucas* that recognizes the determinative nature of state property law that existed prior to the time when the takings claim arose. In Oregon, the Beach Bill's justification as interpreted by the Oregon Supreme Court, is based on the existence of a long standing customary use of the dry sands area of the beach, which is the area between the mean higher high tide level and the vegetation line. *State ex rel. Thornton v. Hay*, 254 Or. 584, 594–97, 462 P.2d 671, 676–78 (1969). This justification should be sustainable against a compensatory takings claim. *See id.*

³² *Palazzolo v. Rhode Island*, 533 U.S. 606, 613–14 (2001).

³³ *Id.*

³⁴ *Id.*

Natural Resources, which initially assented.³⁵ The agency later withdrew approval citing adverse environmental impacts, and Palazzolo's company did not contest the ruling.³⁶ In 1971, Rhode Island created a Coastal Resources Management Council (Council) and charged it with protecting the State's coastal properties, which included the company's wetlands.³⁷ Later, the company was dissolved, leaving Palazzolo as sole owner.³⁸ After Palazzolo applied for a beach club permit to develop both the uplands and wetlands and was again turned down, he sued, alleging a taking.³⁹

The U.S. Supreme Court upheld the Rhode Island Supreme Court decision that there was no per se taking because a home could still be built on the upland, but it reversed the Rhode Island court's decision that Palazzolo could not claim a taking based on his legitimate expectations⁴⁰ because he had notice prior to taking possession personally.⁴¹ Justice Scalia in a concurring opinion said that notice prior to purchase cannot be the sole criterion for denying a taking. Justice O'Connor, concurring, said that under the *Penn Central*⁴² test of investment-backed expectations at the time of acquisition, prior notice remained a factor.⁴³

C. Open Beaches in Texas

Oregon is not bound by the decisions of other states, but sometimes the laws of other states help inform decisions made by Oregon courts. In Texas, since a 1900 hurricane struck the town of Galveston and caused a massive loss of life, the State has been concerned with its

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.* at 614.

³⁸ *Id.*

³⁹ *Id.* at 615–16.

⁴⁰ The “expectations” is a concept developed in *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978).

⁴¹ *Palazzolo*, 533 U.S. at 626.

⁴² “[D]esignation as a landmark not only permits but contemplates that appellants may continue to use the property precisely as it has been used for the past 65 years: as a railroad terminal containing office space and concessions.” *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104 (1978). So the law does not interfere with what must be regarded as *Penn Central*'s primary expectation concerning the use of the parcel. *Palazzolo*, 533 U.S. at 614.

⁴³ *Palazzolo*, 533 U.S. at 633 (O'Connor, J. concurring) (“[I]nterference with investment-backed expectations is one of a number of factors that a court must examine. Further, the regulatory regime in place at the time the claimant acquires the property at issue helps to shape the reasonableness of those expectations.”).

beaches. Texas adopted an open beaches law⁴⁴ before Oregon did, and its law served as a starting point for drafting a very important piece of legislation for Oregon: the Oregon Ocean Shores law adopted in 1967, hereinafter called the “Beach Bill.”⁴⁵ Understanding the Texas law and its evolution may help inform the future course of Oregon’s Beach Bill. The Texas Open Beaches Act provides that “the public shall have the free and unrestricted right of ingress and egress” to both the wet and dry sand areas of the beach where “the public has acquired a right of use or easement to or over” those beaches by prescription, dedication, or custom.⁴⁶

However, the Texas law is different from the Oregon law. The 1977 version of the Texas statute deals with the vegetation line thus:

(8) “Public beach” means any beach area, whether publicly or privately owned, extending inland from the line of mean low tide to the line of vegetation bordering on the Gulf of Mexico to which the public has acquired the right of use or easement to or over the area by prescription, dedication, presumption, or has retained a right by virtue of continuous right in the public since time immemorial, as recognized in law and custom.⁴⁷

The Oregon law deals with both a fixed line and a movable line; “‘Ocean shore’ means the land lying between extreme low tide of the Pacific Ocean and the statutory vegetation line as described by ORS 390.770 or the line of established upland shore vegetation, whichever is farther inland.”⁴⁸ The reference is to a statutorily-defined line connecting specified points, in other words, a fixed line. But the Beach Bill also contemplates the line “of established upland shore vegetation,”⁴⁹ which is certainly, at least in theory, a dynamic line. We discuss the effectiveness of these laws in more detail in Part IV, where we analyze the possibilities for establishing rolling easements and boundaries along the coast.

⁴⁴ See S. 9, 56th Leg., 2d Called Sess., ch. 19, 1959 Tex. Gen. Laws 108 (current version at TEX. NAT. RES. CODE ANN. § 61 (West 2010)).

⁴⁵ Now codified at OR. REV. STAT. §§ 390.605–.770 (2011).

⁴⁶ TEX. NAT. RES. CODE ANN. § 61.011(a) (West 2010). In 1985, the Texas Legislature amended the Act to require disclosures to potential beachfront property owners of the public easement over the dry sand of the beach and effects of the Act. H.R. 14, 69th Leg., Reg. Sess., ch. 350 (Tex. 1985).

⁴⁷ TEX. NAT. RES. CODE ANN. § 61.011 (West 2010).

⁴⁸ OR. REV. STAT. § 390.605(2) (2011).

⁴⁹ *Id.*

II OREGON LINES IN THE SAND

Both common law and statutes inform the current Oregon legal framework that establishes the location of property boundaries and the rules regarding what actions can be prohibited within the public and private portions of the seashore. This section outlines the existing “lines in the sand” and how they came to be established.

A. The Common Law in Oregon—Accretion, Reliction, and Avulsion

In Oregon, courts have adopted and applied the common law concepts of reliction, accretion, and avulsion⁵⁰ in several cases relating to changes in river channels and banks.⁵¹ In 1978, the Oregon Supreme Court considered an ownership dispute between the State and a sand and gravel company along the Willamette River.⁵² The case concerned an island of land in the Willamette River that had been a peninsula until 1890 when a discernible overflow channel formed over the neck of the peninsula. As a result of a 1909 flood, the river suddenly converted the side channel into the main channel of the river. The State proposed a rule that it owns the beds of all navigable rivers, regardless of the time and nature of any changes in those beds. The court held:

We may not adopt a rule, however desirable in other respects, which would take away private property and give it to the state. Unless we can determine . . . that a rule of property placing title in the public has been the law since statehood (or at least since defendant’s predecessors acquired title from the federal government), we cannot adopt and apply it here.⁵³

The court determined that in every state that follows the common law and in which this question had arisen, “it appears to be held or

⁵⁰ For further discussion on this topic, see Janet Newman, *Accretion, Reliction, and Avulsion Oregon Common Law*, in ADAPTING TO CLIMATE CHANGE ON THE OREGON COAST, *supra* note 1, at 30.

⁵¹ See, e.g., *Fellman v. Tidewater Mill Co.*, 78 Or. 1, 7, 152 P. 268, 270 (1915) (holding that the purchaser of tidewater lands, taking to the low-water mark, acquires title accretions that gradually form); *Wilson v. Shiveley*, 11 Or. 215, 217–18, 4 P. 324, 325 (1884) (holding that the sovereign gains title to the land that is submerged by the landward advance of the sea). We believe it likely that these rivers cases will serve as points of departure for ocean shorelands changes where waters are involved.

⁵² State *ex rel.* State Land Bd. v. Corvallis Sand & Gravel Co., 283 Or. 147, 582 P.2d 1352 (1978).

⁵³ *Id.* at 163, 582 P.2d at 1362.

assumed that an avulsive change in the course of a navigable river does not affect the title to either the old or the new bed.”⁵⁴

Some cases have addressed the question of whether an event is avulsive. For example, in 1964, the Oregon Supreme Court determined that the increase in volume of a river, without an accompanying change in course, was not an avulsive event.⁵⁵ The court found that with its increased volume, the river

flowed within new banks and in this sense the water flowed in a new course. But the principle of avulsion has not, as far as we have been able to ascertain, ever been applied when the sole change in the course of the stream involves simply an extension of its banks by the sudden influx of water.⁵⁶

The characterization of the event, as sudden and perceptible or gradual and imperceptible, determines whether the landowner can claim the property according to the new shore or bank line.

Rules of interpretation for deeds in Oregon specify that if the term “tidewater” is used, then the grant is to the low water mark, “and also the right of this state between [the] high and low watermark.”⁵⁷ Further, Oregon statutes make a distinction between submersible and submerged lands, the latter being the area seaward of the “line of ordinary low water,”⁵⁸ which means the line to which the low water ordinarily receded during the previous year.⁵⁹ The land between extreme low water and the ordinary high tide (likely to mean “mean higher high tide” in current parlance) cannot be alienated by state agencies, except as provided by law.⁶⁰

⁵⁴ *Id.* at 164–65, 582 P.2d at 1362–63.

⁵⁵ *Purvine v. Hathaway*, 238 Or. 60, 65, 393 P.2d 181, 184 (1964) (“We are of the opinion that the increase in flow of water through the former course of Hogue creek does not make applicable the principle of avulsion . . .”).

⁵⁶ *Id.* at 63, 393 P.2d at 183.

⁵⁷ OR. REV. STAT. § 93.310(5) (2011). The ordinary high water mark has been defined in federal law as the line that the water impresses on the soil by covering it for a sufficient period of time to deprive it of vegetation. In Oregon, the line of ordinary high water has also been defined by statute (ORS 274.005). For a detailed explanation of the high water mark, see *Oregon’s Waterways FAQs*, OR. DEP’T STATE LANDS, <http://www.oregon.gov/dsl/nav/Pages/whoownstthewaterways.aspx> (last visited Nov. 7, 2013).

⁵⁸ OR. REV. STAT. § 274.005(8) (2011).

⁵⁹ *Id.* § 274.015.

⁶⁰ *Id.* § 390.615.

B. Beds of the Waters—Low Water Line

Since before the American Revolution, states have owned the beds of navigable waters, and Oregon gained similar ownership when it entered the United States in 1859 under the doctrine of “equal footing.”⁶¹ The Department of State Lands today manages about 800,000 acres of off-shore land, tidelands, and submerged and submersible lands of the state’s navigable waterways.⁶² The Department manages these lands in trust, with revenues from leases going to fund Oregon schools via the Common School Fund.⁶³ The Oregon Constitution requires that the State manage these lands “with the object of obtaining the greatest benefit for the people of this state, consistent with the conservation of this resource under sound techniques of land management.”⁶⁴ Submerged lands are leased for uses including sand and gravel extraction, houseboats, marinas, and log rafts. When such uses are proposed, the Department will often make a jurisdictional determination as to whether the lands are in fact within the purview of the agency. Oregon draws its jurisdictional lines at the line “of ordinary high water” and “of ordinary low water” (defined as the line on the bank or shore to which the high water ordinarily rises and the low water ordinarily recedes annually in season).⁶⁵

C. Banks of the Waters

States of the early United States also owned the banks of the navigable waters, but some states chose to dispose of these banks and others chose to retain them. Donation Land Claims and the patents issued to finalize the ownership of the areas are sometimes claimed to the “low water line” and others to the “edge” of the water. In the 1870s, about a decade and a half after Oregon became a state, there was a short period when persons with land patents (not merely Donation Land Claims) could obtain fee title to the area between high water and low water.⁶⁶ However, Oregon withdrew this right in

⁶¹ See *supra* note 13 and accompanying text.

⁶² *About Us*, OR. DEP’T OF STATE LANDS, http://www.oregon.gov/dsl/Pages/about_us.aspx (last visited Oct. 3, 2013).

⁶³ See OR. REV. STAT. § 327.405 (2011).

⁶⁴ OR. CONST. art. VIII, sec. 5(2).

⁶⁵ OR. REV. STAT. § 274.005(3)–(4) (2011).

⁶⁶ See *Shively v. Bowlby*, 152 U.S. 1, 5 n.1 (1894) (quoting the 1872 Oregon law as amended in 1874).

1878⁶⁷ but again authorized some sales of tidelands in 1899.⁶⁸ Today Oregon claims title to all the previously ungranted “bed and banks” of all navigable waters, i.e., the submerged and submersible lands.⁶⁹

D. Edge of Wet Sands

Transportation has been a major factor in establishing and valuing real property parcels. For millennia, water transportation on the high seas and shores thereof has been recognized as a public, as opposed to a private, right. Before 1920, traveling in a north-south direction along the Oregon coast was very difficult; rocky headlands and vegetative impediments, such as salal, made use of the beaches, the quickest and almost only way to move along the coast. In 1899, the Legislature declared the shore of Clatsop County “between ordinary high and extreme low tides . . . a public highway [that will] forever remain open as such to the public.”⁷⁰ Before he became Governor, Oswald West learned the lay of the land in Oregon as a government land agent. Thus as Governor, in 1913, he proposed and the Legislature adopted a bill making the wet sands portion of all Oregon beaches public highways from the Columbia River clear to the California border.⁷¹ The upper boundary for jurisdiction under these laws in modern terms is defined as mean high water.⁷²

⁶⁷ DIV. OF STATE LANDS, THE HISTORY OF THE ADMINISTRATION OF OREGON’S SUBMERGED AND SUBMERSIBLE LANDS BY THE OREGON STATE LAND BOARD 6 (1996), available at http://www.oregon.gov/dsl/NAV/docs/history_ss_6-96.pdf.

⁶⁸ *Id.* at 9.

⁶⁹ The statute provides:

(7) “Submerged lands,” . . . means lands lying below the line of ordinary low water of all navigable waters within the boundaries of this state as heretofore or hereafter established, whether such waters are tidal or nontidal.

(8) “Submersible lands,” . . . means lands lying between the line of ordinary high water and the line of ordinary low water of all navigable waters and all islands, shore lands or other such lands held by or granted to this state by virtue of her sovereignty, wherever applicable, within the boundaries of this state as heretofore or hereafter established, whether such waters or lands are tidal or nontidal.”

OR. REV. STAT. § 274.005 (2011).

⁷⁰ GUILLERMO M. DIAZ MENDEZ, ANALYSIS OF COASTAL CHANGES ALONG THE NEW RIVER SPIT, BANDON LITTORAL CELL, RELEVANT TO AN ADJUSTMENT OF THE STATUTORY VEGETATION LINE ON THE SOUTH COAST OF OREGON 82 (1998) (citing 1898 Or. Laws 3 (1898)), available at http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/6537/Guillermo_M_Diaz_ocr2.pdf?sequence=1 (last visited Nov. 7, 2013).

⁷¹ *Id.*

⁷² See generally OR. ADMIN. R. 141-088-0000 to -0180 (2013). See also, the Newport, Oregon (Station ID 9435385) data for waterfront benchmark. NOAA, VDATUM FOR THE

E. Ocean Shore Lines—The Beach Bill

Public access to the beaches in Oregon goes back generations. While confirmation of the public's rights to use the tidelands (the wet sands portion of the beach) was made with the Oswald West legislation, use of the dry sands area of the coastline was not similarly specified. In the 1960s, a beachfront motel owner near Ecola Creek in Cannon Beach blocked off a portion of the dry sands portion of the beach and posted it with a "Guests Only" sign, even though the area was long used by the public. This act raised a public outcry in Oregon.⁷³ Working with a version of the Texas open beaches law (already adopted) as a point of departure, the Oregon Department of Highways, then the regulator of traffic on the beaches, proposed to confirm by statute a public use right as existing on the dry sands portion of the beach.

Oregon's Beach Bill drew or anticipated five lines in the sand. First, rather than use the more traditional language of submerged lands to the ordinary low water line, the Beach Bill uses "extreme low tide."⁷⁴ This line is not the same as the definition of the line used for purposes of defining Oregon's ownership of three miles from the coastline.⁷⁵ However, in some management plans the measurement of

COASTAL WATERS OF NORTH/CENTRAL CALIFORNIA, OREGON AND WESTERN WASHINGTON: TIDAL DATUMS AND SEA SURFACE TOPOGRAPHY 62 (2010), available at http://www.nauticalcharts.noaa.gov/csdl/publications/TM_NOS-CS22_FY09_33_Jiangtao_PNW-VDatum.pdf; *Datums for 9435385, Yaquina Usceg Sta, Newport OR*, NOAA TIDES & CURRENTS, <http://tidesandcurrents.noaa.gov/datums.html?id=9435385> (last visited Nov. 7, 2013).

⁷³ For an account, see MATT LOVE, GRASPING WASTRELS VS. BEACHES FOREVER INC.: COVERING THE FIGHTS FOR THE SOUL OF THE OREGON COAST 25–32 (2003).

⁷⁴ There are difficulties in reconciling the low water mark–high water mark–meander line language of traditional deeds. Compare OR. REV. STAT. § 93.310 (2011) ("high and low water mark") with the language of the oceanographers, such as benchmarks used by NOAA: "Mean Lower Low Water," "Mean Tide Level," and "Lowest Astronomical Tide," *Tidal Datum*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., http://tidesandcurrents.noaa.gov/datum_options.html#MHHW (last visited Nov. 7, 2013).

⁷⁵ This line is mean lower low-water as used in *United States v. California*, 447 U.S. 1 (1980), and the "baseline" for defining the territorial sea as used in the Convention on the Territorial Sea and the Contiguous Zone. Convention on the Territorial Sea and the Contiguous Zone, pt. 1, sec. 2, art. 3, Apr. 29, 1958. Also, Leggette and Seletzky state:

[I]n accord with international practice, the "coast line" under the Submerged Lands Act is "ambulatory," shifting as the coast erodes or accretes This is why, faced with the threat (and reality) of significant coastal erosion in Louisiana, the Louisiana congressional delegation successfully pressed for an amendment to the Submerged Lands Act in 1986. Under that amendment, the definition of "boundaries" was revised to immobilize any offshore boundary "which has been or is hereafter fixed by coordinates under a final decree of the United States Supreme

the three miles of the ocean starts from the line of extreme low water.⁷⁶ Second, the initial changes to the Beach Bill established a line defined by statute, now found in ORS 390.770 et seq., and this line became significant in determining the requirements for permits for oceanfront protection structures. Third, a procedure was established for changing the statutory line.⁷⁷ Fourth, by definition within the Beach Bill, there is a line that appears movable, i.e., “(2) ‘Ocean shore’ means the land lying between extreme low tide of the Pacific Ocean and the statutory vegetation line as described by ORS § 390.770 or the line of established upland shore vegetation, whichever is farther inland.”⁷⁸

The fifth line is the sixteen-foot line,⁷⁹ which serves as a cutoff line for requiring permits for any beachfront protection structure. Several issues were raised in implementing the Beach Bill, including: (1) what is the shoreward limit of the dry sands area, and (2) what is the basis for the public’s right to use this area?

1. Beach Bill Vegetation Line

Oregon’s Beach Bill defines the “ocean shore” as the land between extreme low tide and the statutory vegetation line or the line of established upland shore vegetation, whichever is farther inland.⁸⁰ Thus, it encompasses the old Oswald West wet sands portion of the beach and also includes the dry sands portion.

Court.” . . . Therefore the shoreward boundary of the OCS is fixed in several places, but still ambulatory elsewhere.

L. Poe Leggette & Dimitri Seletzky, *The Outer Continental Shelf Lands Act Turns Fifty: A Premature Look at the First Half-Century of the OCSLA*, in OIL & GAS DEVELOPMENT ON THE OUTER CONTINENTAL SHELF (Rocky Mountain Min. L. Found. 2002).

⁷⁶ OR. REV. STAT. § 196.405(5) (2011). See also OR. COASTAL MGMT. PROGRAM, OREGON TERRITORIAL SEA PLAN app. D, available at http://www.oregon.gov/LCD/OCMP/docs/ocean/otsp_app-d.pdf (last visited Nov. 7, 2013).

⁷⁷ OR. REV. STAT. § 390.755 (2011) and OR. ADMIN. R. 736-023-0030(3) (2013) provides a mechanism for moving the line within one of the Oregon coast’s twenty-two littoral cells based on the density and location of the vegetation, its shift, the cause, likelihood of long term stability, the line of extreme high tide, the area commonly identified by the public as customarily used, fiscal impact, prior agency decisions, length of the segment under review, effect of move on private landowners, effect of move on public beach use, and public costs.

⁷⁸ OR. REV. STAT. § 390.605(2) (2011).

⁷⁹ OR. REV. STAT. § 390.640(3) (2011) (“[The ‘16-foot contour’] refers to the United States Coast and Geodetic Survey Sea-Level Datum of 1929 through the Pacific Northwest Supplementary Adjustment of 1947.”).

⁸⁰ OR. REV. STAT. § 390.605(2) (2011).

As climate change affects this ocean shore, high waves and storm surges will impact the vegetation line. Because of the law's language, "whichever is farther inland," it appears that the statute and the boundaries it establishes should be fluid and changeable. As such, it should provide the flexibility necessary to protect public beaches from encroachment even where sea levels rise and increasingly high storm surges alter the line of vegetation. However, another element may prevent this natural migration of the shoreline from occurring, namely, the hardening of the shoreline with such means as sea walls or riprap. In addition, so far, there has been no reconciliation of the other three major provisions of the law that could impede line movement, namely the statutory line, the sixteen-foot line, and the existence of a procedure for moving the line. While the Oregon Parks and Recreation Department (OPRD) has undertaken reviews of the statutory line, little has changed in the last forty years.

2. The Beach Bill—Oceanfront Protective Structures

Once the vegetation line is established, the question is what goes on seaward of that line? Two issues are of significance: public access and protective structures for oceanfront homes. OPRD, the responsible state agency, issued 278 oceanfront protective structures for upland developments between 1967 and 2003, covering more than six miles of coastline, and it expected an increase in those numbers.⁸¹ If a person is contemplating the construction of an oceanfront protective structure (e.g., riprap to protect a house that otherwise might slide into the water or onto the beach) within the ocean shore area, a permit is necessary under the Beach Bill. No such permit is necessary if the structure is above the sixteen-foot line as determined using 1929 U.S. Coast and Geodetic Survey references.⁸² Thus, the Legislature appears to have placed a "hard stop" on the ambulation of the vegetation line under the Beach Bill, at least as to oceanfront protective structures.

The Beach Bill's purpose is clear as to public access. After reciting the public's long and uninterrupted use of the ocean shore, the Legislature recognized "that it is in the public interest to protect and

⁸¹ OR. PARKS & RECREATION DEP'T, OCEAN SHORE MANAGEMENT PLAN 154 (2005), available at http://www.oregon.gov/oprd/PLANS/docs/masterplans/osmp_hcp/ocean_shores/finaloceanshoresmp052305.pdf.

⁸² OR. REV. STAT. §§ 390.760, 390.640 (2011). The 1929 datum is now out of date, as a newer 1988 datum is available.

preserve such public rights or easements as a permanent part of Oregon's recreational resources."⁸³ Further, the ocean shores "shall be held and administered as state recreation areas," and the Legislature further declared "it is in the public interest to do whatever is necessary to preserve and protect scenic and recreational use of Oregon's ocean shore."⁸⁴ Thus, the 1967 Beach Bill made a use-shift on the wet sands land from mere highway use to scenic and recreational use.⁸⁵ In addition, the Legislature declared the State's intent to do whatever is necessary. Finally, with the words "preserve and protect," both scenic and recreational uses are designated as paramount.⁸⁶

Even though the legislative policy in the Beach Bill is forceful, concern for private property rights surfaces. Beaches retreat landward and build seaward in response to changes in sea level, storm waves, and other natural processes. This is fundamental to their protective role as well as to their continued existence. Because the beach is dynamic in nature, changing over seasons and over time, beachfront property owners seeking to protect their developments often desire to construct seawalls or riprap to prevent capture of their developments by the sea. But such structures often have the effect of narrowing the width of the beach and limiting or eliminating public access. Some of the other effects of hardened oceanfront structures include increased erosion of adjacent properties, increased scour (resulting in beach loss), and sand entrapment (preventing beach sand replenishment). Shoreline hardening to thwart nature's ebb and flow is not beach protection or preservation. In addition to the physical impacts to the dynamic natural processes of the beach, revetment structures can interfere with the public's access to and use and enjoyment of the beach on which they are constructed. For example, riprap structures built away from the toe of a bluff narrow the beach, potentially eliminating the north-south passage during high tide. Large riprap structures also have negative aesthetic effects where they are not designed to blend into the surrounding landscape.⁸⁷

⁸³ *Id.* § 390.610.

⁸⁴ *Id.* § 390.610(3).

⁸⁵ It can be argued that the shift in use to recreational use was already underway in 1947 when the Legislature authorized restrictions on vehicles on certain portions of the beaches. *See* 1947 Or. Laws 847 (1947).

⁸⁶ OR. REV. STAT. § 390.610(4).

⁸⁷ *See* DEAN, *supra* note 22, at 36.

In an attempt to balance the private property rights against the policy of public use of and access to the dry sand beach, the Beach Bill requires a permit for improvements to the ocean shore within the dry sand area. OPRD is charged with both protecting and preserving the scenic and recreational values and public rights in the ocean shore and with issuing beachfront development permits. In order to manage and regulate construction along the public shoreline, the Department's rules⁸⁸ provide the framework, standards, and process for reviewing and granting permits for ocean shore construction or alteration. These permits are required for seawalls, riprap, or other shoreline protection structures and barriers that will encroach into the public area of the beach. Thus, the Oregon Legislature has made clear that the public may relinquish its rights to the ocean shore, but only in some cases for projects meeting specified criteria.

The current system of comprehensive land use planning in Oregon began with Senate Bill 100 (SB 100).⁸⁹ SB 100 asserted state authority over land use policy and zoning and established the Land Conservation and Development Commission (LCDC) to develop Statewide Planning Goals and direct preparation of local comprehensive plans, zoning, and land use regulations. Through its statewide planning goal adoption process, the LCDC in 1976 recognized the Beach Bill requirement to protect the public beaches in the Statewide Planning Goals. In particular, Goal 17, addressing Coastal Shorelands, states a preference for "non-structural solutions" over structural solutions, such as engineered riprap, to deal with problems such as erosion: "Land-use management practices and non-structural solutions to problems of erosion and flooding shall be preferred to structural solutions."⁹⁰

Similarly, Goal 18, addressing Beaches and Dunes, includes Implementation Requirement 5, which provides that "[p]ermits for beachfront protective structures shall be issued only where development existed on January 1, 1977."⁹¹ The Land Use Board of

⁸⁸ OR. ADMIN. R. 736-020-0001 to -0032 (2013).

⁸⁹ S. 100, 57th Or. Legis. Ass'y, 1973 Reg. Sess. (Or. 1973).

⁹⁰ OR. ADMIN. R. 660-015-0010(2) (2013); OR. DEP'T OF LAND CONSERVATION & DEV., OREGON'S STATEWIDE PLANNING GOALS & GUIDELINES: GOAL 17: COASTAL SHORELANDS 5 (2010), available at <http://www.oregon.gov/LCD/docs/goals/goal17.pdf>.

⁹¹ OR. ADMIN. R. 660-015-0010(3) (2013); OR. DEP'T OF LAND CONSERVATION & DEV., OREGON'S STATEWIDE PLANNING GOALS & GUIDELINES: GOAL 18: BEACHES AND DUNES 2 (2010), available at <http://www.oregon.gov/LCD/docs/goals/goal18.pdf>.

Appeals (LUBA) quoted one of the parties in a case before it, which debated the scope of the requirement:

Implementation Requirement 5 is an acknowledgment that beachfront protective structures are man-made structures that cause problems—they cause problems for adjacent property owners, they cause problems for non-adjacent owners and they cause problems for the state, which owns and manages in trust for the public the ocean shore and all lands westward of the ocean shore. Because [the Land Conservation and Development Commission] knew that such structures can cause problems and also recognized that some development had already occurred in reliance on the ability to build such structures, it adopted Implementation Requirement 5. The State would not interfere with the right of property owners who owned developed property to protect that property, because they may have developed with the expectation that their structures could be protected. However, new development will only occur with the knowledge that beachfront protective structures will not be allowed. New development will not be allowed to cause problems for others.⁹²

“For purposes of this requirement . . . ‘development’ means houses, commercial and industrial buildings, and vacant subdivision lots which are physically improved through construction of streets and provision of utilities to the lot”⁹³ The Statewide Goals do not define “areas” but Oregon’s LUBA has confirmed Lincoln County’s interpretation that this provision refers to those portions of parcels where development existed on January 1, 1977.⁹⁴

ORS 197.180(1) requires all actions taken by state agencies, such as OPRD, to comply with the Statewide Planning Goals. OPRD has folded the policies adopted by the Legislature and LCDC into its administrative rules for the issuance of permits.⁹⁵

Oregon Administrative Rules 736-020 set out the standards for the issuance of ocean shore protective structure permits.⁹⁶ The standards are set out in mandatory language such as “there shall be” and “there are.”⁹⁷

⁹² *Regen v. Lincoln Cnty.*, 49 Or. LUBA 386, 393 n.12 (2005) (quoting Intervenor Oregon Shores Conservation Coalition).

⁹³ See OR. DEP’T OF LAND CONSERVATION & DEV., *supra* note 91, at 2.

⁹⁴ *Regen*, 49 Or. LUBA at 395–96.

⁹⁵ OR. ADMIN. R. 736-020-0005(6) (2013).

⁹⁶ OR. ADMIN. R. 736-020-0001 to .0015 (2013).

⁹⁷ *Id.*

These standards are not framed as part of some balancing test. All of the criteria must be met in order to issue a permit. In reviewing an application for a shore protective structure, the burden is on the applicant to show that the proposed structure meets all of the criteria. However, once again, these regulations do attempt to balance the public's interest in the sea shore with protection of private property investments. As discussed in Part III, it appears that the balance sought has become rather one-sided in practice.

3. Beach Bill Litigation

In *State ex rel. Thornton v. Hay*, a challenge to the Beach Bill came from the owners of a beachfront motel in Cannon Beach who had fenced off a portion of the dry sand beach in front of their motel to exclude the public.⁹⁸ The owners' original acts resulted in adoption of the Beach Bill. In *Hay*, the Oregon Supreme Court determined that the public's right to access and use of the dry sand beach stems from the doctrine of custom⁹⁹ and found that "the dry-sand area along the Pacific shore . . . has been used by the public as public recreational land according to an unbroken custom running back in time as long as the land has been inhabited."¹⁰⁰ The court also determined that the public's use of the beach "is so notorious that notice of the custom on the part of persons buying land along the shore must be presumed."¹⁰¹ The court extended its findings beyond the particular stretch of beach in question and concluded that "[o]cean-front lands from the northern to the southern border of the state ought to be treated uniformly."¹⁰² The customary use doctrine selected by the Oregon Supreme Court to confirm the right of the public to use the dry sands portion of the beach has been upheld by a federal court as well.¹⁰³

For many years, the *Hay* rule established and made certain the public's right to access and use the dry sand beach along the entire Oregon coastline, from the mouth of the Columbia to the Oregon-

⁹⁸ *State ex rel. Thornton v. Hay*, 254 Or. 584, 462 P.2d 671 (1969).

⁹⁹ *Id.* at 596-98, 462 P.2d at 677 (citing to Sir William Blackstone's Commentaries, the court identified and applied seven requirements to establish a right by custom: (1) primordial; (2) exercised without interruption; (3) peaceable and free from dispute; (4) reasonable; (5) certain; (6) obligatory on all landowners; and (7) not inconsistent with other customs or law).

¹⁰⁰ *Id.* at 595, 462 P.2d at 676-77.

¹⁰¹ *Id.* at 598, 462 P.2d at 678.

¹⁰² *Id.* at 595, 462 P.2d at 676.

¹⁰³ *Hay v. Bruno*, 344 F. Supp. 286, 290 (D. Or. 1972).

California border. But in 1989, that certainty was disrupted. In *McDonald v. Halvorson*, owners of property along a coastal area known as Little Whale Cove sought to establish that their property included the dry sand area of the beach.¹⁰⁴ The Oregon Supreme Court, in reversing the Court of Appeals and sustaining the trial court's decision, considered the factual question of whether Little Whale Cove is an area to which the rule of *Hay* applies¹⁰⁵ and concluded, based on the facts presented at trial, that it was not a part of the ocean and, therefore, the narrow beach east of the cove was not a part of the "dry-sand area along the Pacific shore."¹⁰⁶ Although the holding is very fact-specific, the case did reopen the question of limits on the public's right to access and use the shore.

Finally, another Cannon Beach case examined the customary use in light of the U.S. Supreme Court case of *Lucas v. South Carolina Coastal Council*.¹⁰⁷ The Stevens wanted to build a motel on the dry sands portion of the beach and needed a seawall to protect the construction.¹⁰⁸ They applied for three permits: an Oregon Division of State Lands permit to fill behind the sea wall, a permit from the City of Cannon Beach to build in the dry sands area, and a permit from OPRD for an Oceanfront Protective Structure.¹⁰⁹ All three applications were denied, and the Stevens filed a takings claim based on *Lucas* and Goal 18 as implemented by Cannon Beach.¹¹⁰ The Oregon Supreme Court, in applying *Lucas*, held that because of the customary easement, the Stevens never had a property right to build

¹⁰⁴ *McDonald v. Halvorson*, 308 Or. 340, 780 P.2d 714 (1989).

¹⁰⁵ *Id.* at 360, 780 P.2d at 724 ("The evidence establishes that the cove has been in private hands since statehood and that for many years trespassers have been discouraged and even, on occasion, evicted. The only access to the cove is over private property or across a dangerous, uneven field of rocks on the foreshore of the headland immediately to the north of the property. The narrow beach on the eastern bank of the cove does not abut the ocean. There is no testimony in this record showing customary use of the narrow beach on the bank of the cove. The unique physical geography of the cove and its banks (separated as they are from the ocean's tidal limits by both the basalt sill and distance) does not suggest any likelihood of consistent utilization by ancient inhabitants. The doctrine of custom announced in *Hay* simply does not apply to this controversy. The public has no right to recreational use of the narrow beach at Little Whale Cove by virtue of the doctrine of custom, because there is no factual predicate for application of the doctrine.").

¹⁰⁶ *Id.* at 352, 780 P.2d at 720.

¹⁰⁷ *Stevens v. City of Cannon Beach*, 317 Or. 131, 854 P.2d 449 (1993).

¹⁰⁸ *Id.* at 133, 854 P.2d at 451.

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

on the dry sands, and in addition, the regulations did not deprive the Stevens of all their uses and hence there was not a total taking.¹¹¹

Litigation challenging the Beach Bill's provisions has thus far been unsuccessful in overturning the Legislature's concepts for beach protection. However, further regulation of private property at the ocean shore is almost certainly likely to face similar challenges.

F. Beaches and Dunes—Foredunes

Oregon's coastline is important to Oregonians. In the 1960s, Mark Hatfield, then governor of Oregon, commented about a public relations effort for the three towns of central Lincoln County, that they were not the "Twenty Miracle Miles" but rather the "Twenty Miserable Miles."¹¹² In 1967, Oregon passed the Beach Bill.¹¹³ In 1971, coastal governments sought to band together by offering a bill to create an Oregon Coastal Conservation and Development Commission (OCC&DC) to conduct a four-year study and make recommendations. The Commission was to be comprised of eight city council members, eight county commission members, and eight port commissioners.¹¹⁴ Amendments proposed by several community and environmental groups, including the newly created Oregon Shores Conservation Coalition, resulted in the addition of six "citizen members," for a total of thirty members.¹¹⁵ In 1972, Governor McCall declared a moratorium on construction in Lincoln County based on decisions by local officials who "had approved a subdivision of 1,400 lots with a drain-fields area for only 600 houses" and on the fact that "thirty-nine of the 60 water systems [in the county] did not meet state standards."¹¹⁶ In 1973, when the Legislature created the LCDC, the OCC&DC was instructed to report out to the LCDC for

¹¹¹ *Id.* at 150, 854 P.2d at 460 ("[B]ecause it is clear that, under the challenged ordinances and regulations, a seawall could be built on plaintiffs' land if the other criteria, not challenged in this case, were met, those sources of law withstand an 'as applied' challenge in the present case. We hold that there was no taking of plaintiffs' property within the meaning of the Fifth Amendment.").

¹¹² See John Terry, *A Mark Hatfield Memory: The Governor and the Cub Reporter*, THE OREGONIAN (Aug. 13, 2011, 10:00 AM), http://www.oregonlive.com/O/index.ssf/2011/08/a_mark_hatfield_memory_the_gov.html.

¹¹³ H.B. 1601, 1967 Leg., 54th Sess. (Or. 1967) (codified at OR. REV. STAT. § 390.605) (2013).

¹¹⁴ 1971 Or. Laws 1118-19 (1971).

¹¹⁵ *Id.*

¹¹⁶ TOM MCCALL & STEVE NEAL, TOM MCCALL: MAVERICK 199 (1977).

implementation purposes.¹¹⁷ This resulted in the creation of four coastal goals: an estuaries goal, a coastal shorelands goal, a beaches and dunes goal, and an oceans resources goal.¹¹⁸ In 1976, the LCDC adopted the Beaches and Dunes Goal for local governments to meet in their land use planning. A part of this Statewide Planning Goal 18 is Implementation Requirement (IR) 2, which provides: “Local governments and state and federal agencies shall prohibit residential developments and commercial and industrial buildings on beaches, active foredunes, on other foredunes which are conditionally stable and that are subject to ocean undercutting or wave overtopping, and on interdune areas (deflation plains) that are subject to ocean flooding.”¹¹⁹

A recent case sustained one jurisdiction’s location of landward extent of this foredune line.¹²⁰ Lot owners in the City of Bandon on the Oregon coast wanted to build a house in an area on the leeward side of a foredune.¹²¹ In its acknowledged zoning ordinance, the City, in the process of implementing the above implementation requirement, had defined a foredune to include the leeward area to the point where the dune flattened out.¹²² In its review, the Oregon Court of Appeals found no fault with the definitions. Specifically, “the foredune extends easterly to a point where the ground becomes relatively level or horizontal.”¹²³ The term “lee” simply refers to the side sheltered from the wind and provides no specific basis for determining the geographic extent of the foredune.¹²⁴ The term “reverse slope” clearly supports a decision that the geographic extent of the foredune is where the slope ceases its descent or declination away from the top surface (i.e., at the bottom of the slope).¹²⁵ “The term ‘slope’ clearly supports the same conclusion regarding the geographic extent by describing the term slope in relation to a

¹¹⁷ S. 100, 57th Or. Legis. Ass’y, 1973 Reg. Sess. (Or. 1973) (fulfilling the single agency requirement of § 306 of the newly adopted national legislation, the Coastal Zone Management Act of 1972. See Sam Kalen, *The Coastal Zone Management Act of Today: Does Sustainability Have a Chance?*, 15 SOUTHEASTERN ENVTL. L.J. 191 (2006).

¹¹⁸ See *supra* Part II.E.2.

¹¹⁹ See OR. DEP’T OF LAND CONSERVATION & DEV., *supra* note 91 at 1.

¹²⁰ Rudell v. City of Bandon, 249 Or. App. 309, 275 P.3d 1010 (2012).

¹²¹ *Id.* at 311, 275 P.3d at 1011.

¹²² *Id.*

¹²³ *Id.* at 314, P.3d at 1013.

¹²⁴ *Id.* at 312, P.3d at 1012.

¹²⁵ *Id.*

downward slant or inclination; the ground forming an angle with the plane of the horizon; or deviation from the horizontal or perpendicular.”¹²⁶ Thus, the court sustained the City’s decision denying the right to construct a dwelling on the lee side of the foredune.¹²⁷

Goal 18’s provisions are aimed at both protecting beaches and dunes and avoiding hazards to private property developments in these dynamic coastal areas. It remains to be seen how the application of Goal 18 will be adjusted along with our shifting shorelines.

G. Coastal Shorelands

Under Oregon law, the term “coastal shorelands” does not have the same definition as “ocean shore” under Oregon’s Beach Bill.¹²⁸ Beyond the Ocean Shore line of the Beach Bill and Goal 18’s foredunes, deflation plains, and unstable secondary dunes, Oregon’s land use law requires special treatment of coastal shorelands through the LCDC’s Goal 17.¹²⁹ On the ocean front, among other areas, local governments must include in their coastal shorelands: (1) areas subject to ocean flooding, (2) lands within one hundred feet of an ocean shore, (3) adjacent areas of geologic instability where the instability will affect a coastal water body, (4) riparian resources such as stabilizing vegetation, (5) riparian vegetation needed to maintain water quality and water temperature, (6) areas of exceptional scenic quality (e.g., special places to watch sunsets), (7) significant shoreland and wetland biological habitats, and (8) coastal headlands.¹³⁰ Several issues have arisen with regard to coastal shorelands restrictions on development within these areas.

1. Coastal Shorelands—Setback from Top of Bluff

One example of how this special treatment operates arises out of a homeowner’s application to expand a home that had been placed in an excavation of the top edge of the bluff.¹³¹ The City of Bandon had specified that the Goal 17 overlay was at the top edge of the bluff,

¹²⁶ *Id.* at 314, 275 P.3d at 1013.

¹²⁷ *Id.* at 320, 275 P.3d at 1016.

¹²⁸ Compare OR. DEP’T OF LAND CONSERVATION & DEV., *supra* note 90 at 2–3 with OR. REV. STAT. § 390.605.

¹²⁹ OR. DEP’T OF LAND CONSERVATION & DEV., *supra* note 90 at 2–3.

¹³⁰ *Id.*

¹³¹ *Crowley v. City of Bandon*, 43 Or. LUBA 79 (2002).

thus defining the edge of geological stability.¹³² An opponent said a geological report was required because it was in a coastal shoreland with geological instability.¹³³ LUBA remanded the appeal to the City, because as a condition of obtaining LCDC acknowledgment for its comprehensive plan, the City had been required to obtain a geological report as a mandatory standard *before* the development could be approved, and it had not done so.¹³⁴

In another case, property was located within the City of Newport's Ocean Resources Shorelands Overlay Zone.¹³⁵ In addition, the property was in a geologic hazard area.¹³⁶ In such areas, in fulfillment of Goal 17, the city code contained a requirement that development be set back 2.75 feet from the top of the bank per each vertical foot of bank.¹³⁷ While the developer planned to set the building back approximately seventy-five feet from the top of the bank, it intended to grade out the sixty-foot bank to thirty feet to open views for the southern wing of its eighty-one unit hotel.¹³⁸ LUBA, in its remand, focused on whether the erosion rate of the bluff would be increased by the grading, and it held that since the geologic report did not address bluff removal, the City had no basis for concluding that the bluff removal permit was consistent with the City's code.¹³⁹

2. Coastal Shorelands–Habitat Lines

Other Goal 17 inventory areas to be identified are biological habitats whose qualities are related to association with coastal waters.¹⁴⁰ In *Holloway v. Clatsop County*, there was a challenge to a decision allowing five dwelling sites where only two had been allowed before.¹⁴¹ Clatsop County had adopted and applied to the involved area a Shorelines Overlay Zone, one of the purposes of which was for protecting wildlife in the foredunes.¹⁴² The zoning on a

¹³² *Id.* at 82.

¹³³ *Id.* at 85–86.

¹³⁴ *Id.* at 95–96.

¹³⁵ *Terra v. City of Newport*, 36 Or. LUBA 582 (1999).

¹³⁶ *Id.* at 585.

¹³⁷ *Id.* at 602.

¹³⁸ *Id.*

¹³⁹ *Id.* at 606.

¹⁴⁰ OR. DEP'T OF LAND CONSERVATION & DEV., *supra* note 90 at 2.

¹⁴¹ *Holloway v. Clatsop Cnty.*, 52 Or. LUBA 644 (2006), *aff'd*, 210 Or. App. 467, 151 P.3d 961 (2007).

¹⁴² *Id.*

10.9-acre parcel was changed from allowing two dwellings to allowing five dwellings.¹⁴³ The overlay zone, which did not change when the County allowed amendments to the plan or zone, resulted in an 8.8-acre construction setback restriction on the “western” portion of the lot and a requirement for construction of dwellings outside the overlay zone if possible.¹⁴⁴ Because these restrictions would not be changed and because there did not appear to be any adverse effect on the undeveloped land to the north, LUBA upheld the zone change.¹⁴⁵

3. Coastal Shorelands—Geologic Hazards Lines

Oregon Statewide Planning Goal 17 requires that the extent of coastal shorelands shall include in relevant part (1) areas subject to ocean flooding and lands within one hundred feet of the ocean shore and (2) adjacent areas of geologic instability where the geologic instability is related to or will impact a coastal water body.¹⁴⁶ Curry County’s comprehensive plan includes a similar requirement, identifying the extent of coastal shorelands to include “(1) lands which are directly affected by the hydraulic actions of the coastal water body; [and] (2) adjacent areas of geologic instability.”¹⁴⁷ The County’s comprehensive plan also states that where the coastal shorelands’ boundary is defined as the “top of the seacliff,” the boundary will be modified on a case-by-case basis to be a specific line as defined by analysis of the cliff erosion geological hazard, which is mandatory under the requirements for “Development in Areas of Geologic Hazard.”¹⁴⁸ In reviewing an application for a project that potentially included areas within the coastal shorelands boundary, the County accepted the applicant’s proposal for delineating the “top of the seacliff” and added a condition that, prior to final master plan approval, the applicant must submit a surveyed line, described as the “[i]nland extent of lands affected by direct hydraulic action of coastal water,” and this surveyed line shall be considered the approved shoreland boundary.¹⁴⁹ On review, LUBA remanded the decision because the County failed to properly apply its

¹⁴³ *Id.* at 647.

¹⁴⁴ *Id.* at 686.

¹⁴⁵ *Id.* at 658.

¹⁴⁶ OR. DEPT. OF LAND CONSERVATION & DEV., *supra* note 90 at 2–3.

¹⁴⁷ CURRY CNTY., CURRY COUNTY COMPREHENSIVE PLAN 300 (2009), *available at* http://www.oregon.gov/LCD/OCMP/docs/Public_Notice/CurryCounty_CompPlan_EPs.pdf.

¹⁴⁸ *Id.* at 301.

¹⁴⁹ Or. Coast Alliance v. Curry Cnty., 63 Or. LUBA 324, 333 (2011).

comprehensive plan requirements consistent with Goal 17, in particular by failing to include “adjacent areas of geologic instability.”¹⁵⁰

Thus, coastal shorelands may need to be specifically identified depending on geologic hazards on a case-by-case basis. This approach could prove useful in making adjustments to the coastal shorelands boundary as coastal conditions change, so long as those changes are anticipated and reflected in local land use plans.

H. FEMA and the Ocean Storm Wave Line (V Zones)

Flooding is of major concern along the Oregon coast. Federal law, particularly the flood insurance system managed by the Federal Emergency Management Agency (FEMA), has encouraged development and rebuilding in unsustainable areas. When disastrous floods occur, if the FEMA Flood Insurance Rating Map (FIRM) system is in place, if proper local ordinances have been adopted, and if a homeowner, renter, or nonresidential owner has purchased a policy, then flood insurance claims will be satisfied to help compensate for losses resulting from the disaster. This program provides funds for planning and limited funds for acquisition of endangered properties,¹⁵¹ but the program has not been well-funded and is subject to abuse.¹⁵² Under federal law, homeowners can insure their homes against flooding for up to \$250,000 and their contents for up to \$100,000. Renters can cover their belongings for up to \$100,000. Nonresidential property owners can insure a building and its contents for up to \$500,000 each. The average flood insurance premium for a homeowner is a little more than \$500 a year,¹⁵³ but in a

¹⁵⁰ *Id.* at 346. In October 2013, LUBA remanded the decision, once again finding that the County did not ensure compliance with Goal 17’s 100-foot setback requirement. *Or. Shores Conservation Coal. v. Curry Cnty., Or.* LUBA Nos. 2013-033 & -034 (Oct. 11, 2013), <http://www.oregon.gov/LUBA/docs/Opinions/2013/10-13/13033.pdf>.

¹⁵¹ See OFFICE OF INSPECTOR GEN., DEP’T. OF HOMELAND SEC., SURVEY OF HAZARD MITIGATION PLANNING (2012), available at http://www.oig.dhs.gov/assets/Mgmt/2012/OIG_12-109_Aug12.pdf.

¹⁵² See generally *Component: Federal Emergency Management Agency (FEMA)*, DEP’T. OF HOMELAND SEC., http://www.oig.dhs.gov/index.php?option=com_content&view=article&id=25&Itemid=38 (last visited Sept. 29, 2013).

¹⁵³ FED. EMERGENCY MGMT. AGENCY, DEP’T OF HOMELAND SEC., FLOOD INSURANCE: HOW IT WORKS 1 (Mar. 2007), available at http://www.state.il.us/iema/planning/Documents/Haz_Flood_Insurance_How_It_Works.pdf (“Flood insurance is sold and serviced by about 90 private insurance companies in more than 20,200 communities nationwide.”).

designated oceanfront velocity storm zone (i.e., a V zone¹⁵⁴), the annual, full coverage premium for a home currently is \$7,173.¹⁵⁵ These additional storm wave areas have a twenty-six percent chance of flooding over the life of a thirty-year mortgage.¹⁵⁶ As a result of 2012 legislation, the cost of flood insurance will go up even more for vacation homes and properties where repetitive flood damage has occurred.¹⁵⁷

On the Oregon coast, as elsewhere, the FIRM shows coastal areas with a one percent or greater chance of flooding and an additional hazard associated with storm waves. For property within the designated zone, any mortgage to be purchased by a federal agency (e.g., federal National Mortgage Association [Fannie Mae]) must have flood insurance. In Lincoln County, the FIRM map shows VE elevations, e.g., in the area of 68th Street in North Newport, Lincoln County, where the elevation is listed as thirty-four feet above sea level.¹⁵⁸

The National Flood Insurance Program is in trouble financially. In 2005, Hurricane Katrina generated eighteen billion dollars in claims;

¹⁵⁴ There are two velocity zones. The V zone line or elevation is established based on interpolations and the VE zone is established on the basis of detailed information. *Definitions of FEMA Flood Zone Designations*, FED. EMERGENCY MGMT. AGENCY, <https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=floodZones&title=FEMA%2520Flood%2520Zone%2520Designations> (last visited Nov. 7, 2013).

¹⁵⁵ *Policy Rates*, NAT'L FLOOD INS. PROGRAM (Sept. 19, 2013), http://www.floodsmart.gov/floodsmart/pages/residential_coverage/policy_rates.jsp. Homes in communities that choose to impose extra mitigation requirements can receive up to 45% reductions in premiums through FEMA's Community Rating System (CRS). FED. EMERGENCY MGMT. AGENCY, DEP'T OF HOMELAND SEC., NFIP FLOOD INSURANCE MANUAL at CRS 26-CRS 27 (2013) (showing that reductions for CRS are currently undertaken in Oregon only for Cannon Beach (15%), Rockaway Beach (0%), City of Tillamook (15%), Tillamook County (0%), and Lane County (15%)), available at http://www.fema.gov/media-library-data/7c1b0352fe3987c36569fcc492ab2ca/change_package_508_oct2013.pdf.

¹⁵⁶ *Definitions of FEMA Flood Zone Designations*, *supra* note 154; see, e.g., FEMA, FLOOD INSURANCE STUDY: LINCOLN COUNTY, OREGON AND INCORPORATED AREAS (2009), available at http://www.oregonriskmap.com/index.php?option=com_docman&task=doc_view&gid=27&Itemid=32. Note that the difference between the V zone and the VE zone is that the V zone line represents an approximation while the VE zone line is based on the detailed storm wave data available and used. *Id.* at 51.

¹⁵⁷ Eric Lipton et al., Flood Insurance, Already Fragile, Faces New Stress, N.Y. TIMES, Nov. 12, 2012, <http://www.nytimes.com/2012/11/13/nyregion/federal-flood-insurance-program-faces-new-stress.html>.

¹⁵⁸ Remapping and the production of new FIRM maps is expected in 2014. See *Current Mapping Projects*, Or. Risk MAP, http://www.oregonriskmap.com/index.php?option=com_content&view=article&id=41:curent-mapping&catid=18:state-overview&Itemid=17 (last visited Nov. 7, 2013).

Congress has allocated sixty billion dollars to address the claims and infrastructure repair from 2012 Superstorm Sandy.¹⁵⁹ The disaster package includes increasing the FEMA borrowing limit by \$9.7 billion as part of the FEMA Disaster Relief Fund.¹⁶⁰

One major problem is repetitive claims. In Oregon, the various county Multi-Jurisdictional Natural Hazards Mitigation Plans are bringing to light the number of repetitive claims. For example, in the Tillamook Plan, the County had 1,598 flood insurance policies in force with 348 loss payments and sixteen repetitive losses, and the City of Tillamook had 348 policies in force with 166 paid losses, of which twelve were repetitive.¹⁶¹

Communities that develop and adopt local natural hazard mitigation plans become eligible for mitigation grant funding and in the process they meet requirements of Statewide Planning Goal 7 dealing with Areas Subject to Natural Hazards.¹⁶² Oregon coastal counties have adopted such plans and are completing the first round of updates. These plans have detailed information on the perceived hazards and goals for mitigation. However, the plans at this point do not appear to address climate change adaptation in any detail. In particular, they do not address which parts of the public infrastructure, such as pipes and roads, need to be moved elsewhere in the event of inundation from a major storm wave or tsunami.

State and local governments can receive Federal Assistance through the Stafford Act as amended. Specifically, upon request of a Governor and Declaration of Disaster by the President, state and local

¹⁵⁹ The FEMA Flood Insurance program is in financial trouble after having borrowed nearly \$18 billion to pay the claims from the 2005 Katrina damages. Jennifer Liberto, *FEMA May Not Have Enough for Flood Damages*, CNN Money (Oct. 31, 2012), <http://money.cnn.com/2012/10/31/news/economy/fema-flood-sandy/index.html>; see also Kathleen Hunter & James Rowley, *Congress Completes \$60.2 Billion in Hurricane Sandy Aid*, Bloomberg (Jan. 28, 2013), <http://www.bloomberg.com/news/2013-01-28/congress-completes-60-2-billion-in-hurricane-sandy-aid.html>.

¹⁶⁰ Chairman Rogers Releases Emergency Legislation for Hurricane Sandy Recovery, U.S. HOUSE OF REP. COMM. ON APPROPRIATIONS (Jan. 1, 2013), <http://appropriations.house.gov/news/documentsingle.aspx?DocumentID=315999>. The final relief is estimated at \$50.5 billion including a temporary FEMA borrowing limit, which was increased to \$30.4 Billion. See H.R. 41, 113th Cong. (2013) (enacted).

¹⁶¹ VLG CONSULTING & SABRINA PEARSON, TILLAMOOK COUNTY, OREGON MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN (2011) 26–27, available at www.co.tillamook.or.us/gov/comdev/documents/planning/Hazard%20mitigation%20plan.pdf.

¹⁶² *Id.* at 2–3.

governments become eligible for ninety percent funding to rebuild a facility in a different location if it is determined that a damaged facility should not be repaired or replaced.¹⁶³ While it is quite possible to see how this law might apply in a tsunami inundation zone, it is more difficult to see from the plans available, for example, how local governments might apply the law in the event of a storm wave on a spring tide with a significant southwest wind and a one-foot sea level rise. In other words, the current framework does not provide clear guidance on how it relates to increasingly severe storm impacts.

I. Tsunami Inundation Zone Line

In 1995, a tsunami was predicted to strike the Oregon coast. Panic ensued, with local residents emptying shelves at grocery stores and packing cars for higher ground.¹⁶⁴ At the same time, inland residents came to the coast to view the anticipated event, causing major traffic jams.¹⁶⁵ The tsunami never materialized, but the effect on local residents revealed a strong message about the need for tsunami planning.¹⁶⁶

The Cascadia Subduction Zone (CSZ) is located off the Oregon coast and extends from Northern California to Vancouver, British Columbia, Canada, where the oceanic Juan de Fuca and Gorda Plates meet the North American Plate.¹⁶⁷ The Zone widens from 60 kilometers off southern Oregon to 150 kilometers off the northern Olympic Peninsula in Washington.¹⁶⁸ Further, geological analysis has substantiated that eventually these smaller plates will be forced under the North American Plate, and this will result in a subduction earthquake that could be of a 9.5 magnitude.¹⁶⁹ This earthquake will be caused by forces moving the Pacific Tectonic Plate against smaller plates, which are, in turn, colliding with the large North American Plate at the rate of one to two inches a year; these movements are

¹⁶³ 42 U.S.C. §§ 5121–5207 (2012).

¹⁶⁴ *Geological Hazards on the Oregon Coast*, DEP'T GEOLOGY & MIN. INDUSTRIES, <http://www.oregon.gov/DOGAMI/Pages/earthquakes/coastal/TsunamiIntro.aspx> (last visited Nov. 7, 2013).

¹⁶⁵ *Id.*

¹⁶⁶ *Id.*

¹⁶⁷ OR. P'SHIP FOR DISASTER RESILIENCE, COOS COUNTY, MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN EQ-1 (2010), available at https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/10751/Coos%20County_NHMP_Final_10.pdf?sequence=1.

¹⁶⁸ *Id.* at EQ-5.

¹⁶⁹ *Id.* at TS-2.

causing portions of the Oregon coast to rise at about one millimeter a year.¹⁷⁰ The earthquake will occur when the strongly coupled interpolate zone gives way to the pressure, and it ruptures.¹⁷¹ The time of the last such earthquake was pinpointed at January 24, 1700, and the next quake can be expected within three hundred to five hundred years of that date.¹⁷² It is anticipated that, based on past frequencies, parts of the coastline will drop or subside as much as eight feet in places along the Oregon coast.¹⁷³ Further, the quake, commonly referred to as the Cascadia Subduction Earthquake, will generate a large wave, a tsunami, that could be as high as fifty feet, and this wave will approach the Oregon beaches in fifteen to twenty-five minutes after the quake.¹⁷⁴ It is possible additional waves bigger than the initial wave may arrive over an eight to ten-hour period.¹⁷⁵ Finally, as the waves approach the Oregon coast's rivers and creeks, a wall of water, called a bore, can develop, and it can be as devastating to harbors as the tsunami's harm is to the ocean shores.¹⁷⁶

According to the U.S. Geological Survey's 2009 Earthquake Probability Mapping, there is approximately a ten percent chance of a 9.0 or greater magnitude earthquake in the CSZ in the next one hundred years.¹⁷⁷ A very recent study, based on thirteen years of research and published in July 2012, finds that the Coos Bay area is more vulnerable than northern stretches of the CSZ and concludes that there is a forty percent chance of a major earthquake in the Coos Bay region during the next fifty years.¹⁷⁸ The study's author, Chris

¹⁷⁰ *Id.*

¹⁷¹ *Id.*

¹⁷² *Id.* at EQ-2.

¹⁷³ OR. SEISMIC SAFETY ADVISORY COMM'N, THE OREGON RESILIENCE PLAN 11–12 (2013) (“[T]he amount that the land will drop varies from place to place, with as much as 5 to 6 feet possible near Astoria, and even more possible at Brookings.”), available at http://www.oregon.gov/OMD/OEM/osspace/docs/Oregon_Resilience_Plan_Final.pdf.

¹⁷⁴ OR. P'SHIP FOR DISASTER RESILIENCE, *supra* note 167, at TS-1.

¹⁷⁵ *Id.*

¹⁷⁶ *Id.* at TS-2.

¹⁷⁷ 2009 *Earthquake Probability Mapping*, USGS (Nov. 4, 2010), <https://geohazards.usgs.gov/eqprob/2009/index.php> (enter, for example, a location on the Oregon coast, 100 for Time Span, 9.0 for Magnitude, then click on Compute Probability).

¹⁷⁸ 13-year *Cascadia Study Complete—and Earthquake Risk Looms Large*, OR. STATE UNIV. (Aug. 1, 2012), <http://oregonstate.edu/ua/ncs/archives/2012/jul/13-year-cascadia-study-complete-%E2%80%93-and-earthquake-risk-looms-large> (summarizing the conclusions of CHRIS GOLDFINGER ET AL., *TURBIDITE EVENT HISTORY—METHODS AND IMPLICATIONS FOR HOLOCENE PALEOSEISMICITY OF THE CASCADIA SUBDUCTION ZONE* (2012)).

Goldfinger, a professor at Oregon State University, states that “major earthquakes tend to strike more frequently along the southern end—every 240 years or so—and it has been longer than that since it last happened.”¹⁷⁹ Forecasts predict that the CSZ is due for an earthquake similar in strength to the earthquake felt off the coast of Japan in March 2011.

Oregon’s Tsunami Inundation Zone law, first adopted in 1995, is aimed at constraining development of key structures within areas vulnerable to tsunami inundation. Oregon law limits construction of new essential and special occupancy structures in tsunami inundation zones.¹⁸⁰ Essential structures include hospitals, fire and police stations, storage of fire suppression materials and equipment, standby power generation for essential facilities, and government communication centers.¹⁸¹ Within the tsunami inundation zone, the law also restricts development of buildings with a capacity greater than 250 individuals for schools and child care centers, hazardous facilities, and major structures (including buildings with greater than sixty thousand square feet or ten stories).¹⁸² The state Department of Geology and Mineral Industries (DOGAMI) is responsible for establishing the location of tsunami inundation zones based on “scientific evidence that may include geologic field data and tsunami modeling.”¹⁸³ The agency and its governing board are also responsible for consultation and decision making regarding the new development of essential and special occupancy structures within the tsunami zones.

¹⁷⁹ *Id.* The Goldfinger results are inconsistent with some other studies. See, e.g., BRIAN F. ATWATER & GARY B. GRIGGS, DEEP-SEA TURBIDITES AS GUIDES TO HOLOCENE EARTHQUAKE HISTORY AT THE CASCADIA SUBDUCTION ZONE—ALTERNATIVE VIEWS FOR A SEISMIC-HAZARD WORKSHOP 58 (2012), available at <http://pubs.usgs.gov/of/2012/1043/of2012-1043.pdf>. There is other evidence showing that tsunami recurrence is roughly the same for the north, central, and southern Cascadia margin. See Curt D. Peterson et al., *Recurrence Intervals of Major Paleotsunamis as Calibrated by Historic Tsunami Deposits in Three Localities: Port Alberni, Cannon Beach, and Crescent City, along the Cascadia margin, Canada and USA*, 68 NAT. HAZARDS 321 (2013).

¹⁸⁰ OR. REV. STAT. §§ 455.446-.447 (2011).

¹⁸¹ *Id.* § 455.447(a).

¹⁸² *Id.* § 455.447(b).

¹⁸³ *Id.* § 401.950.

III

OREGON LINES IN THE SAND AND CLIMATE CHANGE ADAPTATION

The impacts of climate change on the eastern Pacific Ocean coast area vary widely because of its location in the CSZ and the different weather patterns that affect it. Global sea level rise, with about a meter expected by 2100, will cause a loss of up to two hundred meters of coastal beach width for every meter of rise in sea level rise (i.e., six hundred feet of beach lost for every three feet of sea level rise) in Oregon.¹⁸⁴ Added to the predicted future sea level rise, large storm waves, some up to twenty-six meters (eighty-five feet) at sea, are occurring more frequently on the Oregon coast, threatening property, infrastructure, public access areas, and ecosystems. The Oregon coast experienced episodes of anomalous coastal erosion during the El Niño¹⁸⁵ events in the winters of 1982–83 and 1997–98. The El Niño-altered storm tracks shifted the beach sand to the northern ends of some littoral subcells, leaving the southern ends as rocky shores exposed to bluff erosion. The sand budget¹⁸⁶ for each of the twenty-two littoral cells¹⁸⁷ along the Oregon coast is variable, but overall

¹⁸⁴ Peterson, *supra* note 1, at 12–13. See NAT'L RESEARCH COUNCIL, SEA-LEVEL RISE FOR THE COASTS OF CALIFORNIA, OREGON, AND WASHINGTON: PAST, PRESENT, AND FUTURE (2012), available at http://www.nap.edu/openbook.php?record_id=13389&page=R1; Peter Ruggiero et al., *Impacts of Climate Change on Oregon's Coast and Estuaries*, in OREGON CLIMATE ASSESSMENT REPORT 209–67 (K.D. Dello & P.W. Mote eds., 2010). A modification of the Bruun Rule focusing on beach retreat is where R is the beach retreat distance; S is the sea level rise; and $\tan \beta$ is the slope of the beach. See Heather M. Baron, Coastal Hazards and Community Exposure in a Changing Climate: The Development of Probabilistic Coastal Change Hazard Zones, at 28 (2011) (master thesis), available at <http://nsgl.gso.uri.edu/oresu/oresuy11006.pdf>. Thus, if the beach slope (i.e., $\tan \beta$) is .02, then a three-foot sea level rise would result in a 150-foot retreat. Portland State Geology Professor Curt Peterson thinks the retreat could be as much as 100 to 200 feet per foot of sea level rise on some of Oregon's northern beaches. Peterson, *supra* note 1, at 12. For various beach slopes in Oregon, see *Beach and Shoreline Changes*, NANOOS VISUALIZATION SYS., <http://nvs.nanoos.org/BeachMapping> (last visited Nov. 7, 2013).

¹⁸⁵ An El Niño event is a sea level rise with warming water and storms from the southwest. In addition to this El Niño Southern Oscillation (ENSO), La Niña events, more or less opposite of El Niños, occur. There is a larger, multiyear weather pattern that influences the movement of the jet stream across the Pacific Ocean, called the Pacific Decadal Oscillation (PDO), and this PDO influences Oregon coastal weather and storm patterns.

¹⁸⁶ For a discussion of sand budgets, see OR. P'SHIP FOR DISASTER RESILIENCE, NATURAL HAZARDS MITIGATION PLAN 3-CE-2 (2012), available at <http://csc.uoregon.edu/opdr/sites/csc.uoregon.edu.opdr/files/docs/ORNHMP/2012%20Oregon%20NHMP.pdf> (last visited Jan. 20, 2013).

¹⁸⁷ OR. ADMIN. R. 736-023-0020(17) (2013).

most of the subcells are losing sand, as demonstrated by episodically eroding sea cliffs in northern and southern Oregon, and by foredunes steepening in the south-central Oregon coast.

As discussed above,¹⁸⁸ when the Cascadia Subduction Earthquake occurs, past geologic history indicates that there will be substantial subsidence or sinking of the northern Oregon coast line. This tectonic subsidence (about one meter) is on the same scale as predicted sea level rise in the next century. So, the combination of the two processes is expected to yield up to two meters of shoreline submergence in northern Oregon causing additional beach loss.

Oregon has numerous estuaries, which serve as rearing areas for important runs of anadromous fish, such as Chinook and Coho salmon.¹⁸⁹ These species depend on the shallow depths of bays, marshes, and tide flats as foraging areas and nurseries for young. Many of Oregon's coastal wetlands have been diked for farming, transportation, and other development uses. As sea level rises, the tidal marshes will continue to be lost. Climate change will affect various areas of the coast in different ways depending on tectonic subsidence, sand loss from beaches, and the amount of tidal marsh diking in estuaries. In summary, future sea level rise is a certainty for the Oregon coast, though the specific impacts are expected to differ depending on local factors. These changing conditions will require adaptation measures in order to ensure resilient communities on Oregon's coast. The State and coastal communities will likely need to take action to address the protection of private property and public shoreline access. This can be a difficult balance to strike.

The ability of beaches to retreat landward and build seaward in response to changes in sea level, storm waves, and other natural processes is fundamental to their protective role as well as to their continued existence. Shoreline hardening to thwart nature's ebb and flow is therefore the antithesis of beach conservation.¹⁹⁰

Oregon has adopted a framework for climate change adaptation,¹⁹¹ but the framework specifically acknowledges that adaptation

¹⁸⁸ See discussion *supra* Part II.A.

¹⁸⁹ See A. Magnusson & R. Hilborn, *Estuarine Influence on Survival Rates of Coho (Oncorhynchus kisutch) and Chinook Salmon (Oncorhynchus tshawytscha) Released from Hatcheries on the U.S. Pacific Coast*, 26 ESTUARIES 1094 (2003).

¹⁹⁰ DEAN, *supra* note 22, at 53 (quoting Orrin H. Pilkey).

¹⁹¹ OR. DEP'T OF LAND CONSERVATION & DEV., THE OREGON CLIMATE CHANGE ADAPTATION FRAMEWORK (2010) [hereinafter OREGON FRAMEWORK], available at http://www.oregon.gov/ENERGY/GBLWRM/docs/Framework_Final_DLCD.pdf. Oregon

strategies need to be developed at the regional and local level.¹⁹² The framework primarily identifies the anticipated risks associated with climate change, including loss of wetland ecosystems and services, increased coastal erosion and risk of inundation from increasing sea levels and increasing wave heights and storm surges, and increased incidence of landslides.¹⁹³ Equally important, the framework acknowledges several gaps in the State's ability to address identified risks. For example, regarding coastal erosion, the report notes several shortcomings, including:

- Long-term sea level rise is not a principal factor in Goals 17 and 18, although it should be for land use planning for coastal and shoreland areas[;]
- Oregon lacks information about the cumulative effects of beachfront and estuarine shoreline protective structures[;]
- Oregon lacks a policy framework to use restoration of natural habitats and features as a strategy to buffer the effects of storms, waves, and higher sea levels[; and]
- Oregon does not have a policy framework for managing retreat from areas subject to increased threat of climate-related hazards.¹⁹⁴

Thus, notwithstanding its elaborate land use and hazard planning tools, Oregon appears to be falling behind other states¹⁹⁵ and many nations in planning for adaptation. For instance: (1) the Beach Bill and its vegetation line have not been modified to address climate change adaptation concerns; (2) only two cities on the Oregon coast (Cannon Beach and Bandon) have participated in FEMA's voluntary

has also developed a handbook addressing climate change mitigation. See OR. TRANSP. & GROWTH MGMT. PROGRAM, COOL PLANNING: A HANDBOOK ON LOCAL STRATEGIES TO SLOW CLIMATE CHANGE (2011), available at www.oregon.gov/LCD/tgm/docs/cool_planning_handbook.pdf.

¹⁹² OREGON FRAMEWORK, *supra* note 191, at i.

¹⁹³ *Id.* at 12.

¹⁹⁴ *Id.* at 46.

¹⁹⁵ See, e.g., Md. Exec. Order No. 01.01.2012.29 (2012), available at <http://www.governor.maryland.gov/executiveorders/01.01.2012.29.pdf>. See also new easement effort of Maryland described in *First-of-Its-Kind Easement Protects Historic Area from Sea Level Rise Impacts*, MD. DEP'T NAT. RES. (Aug. 21, 2013), <http://news.maryland.gov/dnr/2013/08/21/first-of-its-kind-easement-protects-historic-area-from-sea-level-rise-impacts/>; *Battleground Dispatches: Norfolk Readies for Future Storms, Sea Level Rise*, PBS NEWSHOUR (Dec. 6, 2012), http://www.pbs.org/newshour/bb/politics/july-dec12/norfolk_12-06.html.

Community Rating System;¹⁹⁶ (3) there is little analysis of how the various spits along Oregon's estuaries need to be managed, given the changes caused by climate change; (4) LCDC has declined to adopt a new Statewide Planning Goal dealing with climate change adaptation or change its goal requirements;¹⁹⁷ and (5) in spite of the optimism about mapping expressed by Oregon's Global Warming Commission,¹⁹⁸ the State seems mired in status quo because of shortage in revenues at the state and local levels.¹⁹⁹

The tsunami safety laws address catastrophic events, but very little effort has been made to address dedicated evacuation routes, vertical evacuation, or restricted high-density development in the most exposed shorelines.²⁰⁰ The tsunami law provides for exceptions from the prohibition on development where "the applicant has demonstrated that the safety of building occupants will be ensured to the maximum reasonable extent."²⁰¹ This may be accomplished by: (1) addressing the relative risks within the zone, (2) balancing competing interests and other considerations, (3) considering mitigative construction strategies, and (4) considering mitigative

¹⁹⁶ FED. EMERGENCY MGMT. AGENCY, COMMUNITY RATING SYSTEM 25–26 (2012), available at <http://www.fema.gov/pdf/nfip/manual200605/19crs.pdf> (last visited Oct. 4, 2013).

¹⁹⁷ For details on the proposed Statewide Planning Goal, see *Goal 20 Proposal*, OR. SHORES CLIMATE ACTION (Sept. 28, 2009), <http://www.oregonshores.org/topic.php5?Section=7&topic=Goal+20+Proposal>.

¹⁹⁸ Some assistance was made available through the § 309 of the federal Coastal Zone Management Act; the DLCD asked for a total of \$194,400 for 2011–2015. OR. COASTAL MGMT. PROGRAM, COASTAL ZONE MANAGEMENT ACT § 309 ASSESSMENT AND STRATEGY 2011–2015 116 (2010), available at <http://coastalmanagement.noaa.gov/mystate/docs/or3092011.pdf>.

¹⁹⁹ See OR. GLOBAL WARMING COMM'N, REPORT TO THE LEGISLATURE 2011 (2011), <http://www.keeporegoncool.org/sites/default/files/ogwc-standard-documents/2011Report.pdf>.

²⁰⁰ However, the City of Cannon Beach has been working on a plan to place community storage facilities in forest lands surrounding the town. The city proposed change to the DLCD in the form of a rule for conditional use permits in forest lands that was adopted by LCDC in OR. ADMIN. R. 660-006-0025 (2013) at its January 2013 meeting. See <http://www.oregon.gov/LCD/Pages/Coastal-Hazard-Facility-Siting—Forest-Zone.aspx> (last visited Oct. 4, 2013). See also *2011–13 Rulemaking*, OR. DEP'T OF LAND CONSERVATION & DEV. (scroll to "LCDC Adopts Rule Amendments Regarding Hazard Response Facilities on Forest Land" under "February 1, 2013") (last visited Sept. 29, 2013).

²⁰¹ OR. REV. STAT. § 455.446(1)(d) (2011).

terrain modification.²⁰² DOGAMI's board may, after a public hearing, grant exceptions to the restrictions where an applicant has made the required demonstration.

After the 2004 Sumatra-Andaman Islands subduction earthquake, which caused tsunami waves of more than one hundred feet in height near its center to spread across the Indian Ocean, DOGAMI concluded that a quake and tsunami wave of that size could hit the Oregon coast. Major revisions in the tsunami inundation zone line are underway, which will result in the impact areas to be extended farther inland. These line changes are planned for completion in 2013.²⁰³ Once the line changes are known, local communities will need to bring their essential structures' replacement plans up to the statutory requirements. Again, this process provides an opportunity to revisit that overall infrastructure to decide what should and should not be replaced when the quake and wave occur. Climate change and tsunami planning both need to be considered when evaluating infrastructure replacement strategies.

Unlike the tsunami safety laws, Oregon's Beach Bill, in concept, provides standards for a variable shoreline to reflect actual conditions. But in reality, the statutory vegetation line has not changed for more than forty years, though emergency riprap permits are requested annually. The general standards applied by the OPRD in considering applications for ocean shore alteration permits require that the applicant show that "[t]here are no reasonable alternatives to the proposed activity or project modifications that would better protect the public rights, reduce or eliminate the detrimental affects [sic] on the ocean shore, or avoid long-term cost to the public."²⁰⁴ Under the Department's recreation use standards, "shoreline alteration projects shall not be a detriment to public recreation use opportunities" and "shall avoid blocking off or obstructing public access routes within the ocean shore area."²⁰⁵ Oregon Administrative Rules 736-020-0010(6) requires that proposed projects be evaluated against several

²⁰² *Id.* The law does not state whether these options are inclusive or exclusive, in other words, whether any one of these is sufficient, or whether all must be demonstrated in order to receive a variance from the prohibition. *Id.*

²⁰³ *Oregon's Tsunami Hazard Mitigation Program (THMP)*, DEP'T GEOLOGY & MIN. INDUS., <http://www.oregongeology.org/tsuclearinghouse/thmp.htm> (last visited Nov. 7, 2013).

²⁰⁴ OR. ADMIN. R. 736-020-0010(4) (2013).

²⁰⁵ OR. ADMIN. R. 736-020-0020 (2013).

of the Statewide Land Conservation and Development Goals, including Goal 17: Coastal Shorelands, which states that:

[I]and-use management practices and non-structural solutions to problems of erosion and flooding shall be preferred to structural solutions. Where shown to be necessary, water and erosion control structures, such as jetties, bulkheads, seawalls, and similar protective structures; . . . shall be designed to minimize adverse impacts on water currents, erosion, and accretion patterns.²⁰⁶

Additionally, Oregon Administrative Rule 736-020-0025(3) requires that the project “be designed to avoid or minimize ocean erosion or safety problems for neighboring properties.”²⁰⁷ The OPRD’s regulations also require that ocean shore alterations “shall be designed to minimize damage to the scenic attraction of the ocean shore area.”²⁰⁸

Despite the apparent clarity and the burden to demonstrate the necessity for shore protection structures in the rules, applications for such construction are rarely denied. Landowners with less than fifty feet of frontage on the ocean require less technical support for their proposals.²⁰⁹ It seems that the State’s expert and the regulatory department almost always accept that the requested riprap or seawall meets the requirements. Furthermore, an emergency permit provision allows for construction of shore protection structures without first meeting the requirements of the statute in the case of an “emergency” so long as the requirements are shown to have been met after the fact. In essence, this allows a beachfront property owner to claim an emergency, build a seawall, and then apply for the permit later. By

²⁰⁶ OR. ADMIN. R. 660-015-0010(2) (2013); OR. DEP’T OF LAND CONSERVATION & DEV., *supra* note 90, at 4.

²⁰⁷ OR. ADMIN. R. 736-020-0015 (2013).

²⁰⁸ *Id.*

²⁰⁹ *But see* COASTAL PROCESS & HAZARDS WORKING GRP., OR. COASTAL MGMT. PROGRAM, OR. DEP’T OF LAND CONSERVATION & DEV., GEOLOGICAL REPORT GUIDELINES FOR SHORELINE PROTECTIVE STRUCTURE APPLICATIONS (2008), *available at* http://www.oregon.gov/LCD/OCMP/docs/publications/geo_rpt_guidelines_sps_09-26-2008.pdf (establishing guidelines for shore protection, but failing to (1) consider the sand budgets for each littoral cell; (2) provide a forecast for the consequences of climate change effects; (3) require a report on the long-term loss of beach width, and (4) provide a process for professional review of the report that was paid for by the engineering geologist’s client). *See also* OR. ADMIN. R. 736-020-0003(2)(c) (requiring, for structures greater than 50 feet, a registered professional geologist’s report describing (A) the impacts of the project on the sand source, supply, and movement on the beach and the same littoral cell, (B) the bank or bluff stability and rates of erosion, (C) a review of non-structural solutions; and (D) any known or suspected geological hazards in the project area).

that time, the structure has already been built, and the OPRD appears reticent to exercise its authority to require a landowner to remove the structure.²¹⁰

In 2011, the OPRD staff reported to the Parks and Recreation Commission regarding the shoreline protection permit program.²¹¹ The staff comment points out that the demand and applications for ocean shore alteration permits are increasing.²¹² More importantly, this pressure is only likely to increase further given climate change models' predictions of increasing storm intensity and accompanying storm wave heights as well as anticipated global sea level rise.²¹³ These and many other factors will affect the way Oregon's coastal shoreline erodes. Oregon's central coast and much of its northern coastline are particularly at risk for increased rates of coastal erosion due to limited beach sand supply and increasing coastal development.²¹⁴

The State of Oregon's clearly expressed policy intention was to prevent the spread of riprap and other forms of shoreline armoring by limiting such structures to properties developed before 1977. Further, the Beach Bill recites the overarching goals of preserving and protecting the public's rights to use the beaches to the vegetation line. Situations in which shoreline protection structures are allowed and where beach width is lost, even if the developments existed before 1977, challenge these guiding principles. There is a pressing need for clarification and consistency in the ocean shore permitting process. More fundamentally, these situations point toward a need to consider carefully where the enforceable limits lie, in light of the ongoing

²¹⁰ See, e.g., Or. Parks & Recreation Dep't, Ocean Shore Alteration Permit for Abbott Channon and Bowman, Permit No., BA 627-07 -2007, available at http://www.oregon.gov/oprd/RULES/docs/ba_627_07_abbott_shannon_bowman_finding.pdf (last visited Nov. 7, 2013).

²¹¹ Tony Stein, Coastal Land Use Coordinator, Or. Parks & Recreation Dep't, Presentation to the Or. Parks & Recreation Comm'n (Mar. 16, 2011) (meeting minutes available at http://www.oregon.gov/oprd/documents/com_2011.3_minutes_approved_final.pdf).

²¹² *Id.*

²¹³ See Peter Ruggiero, *Climate Controls on Northeast Pacific Wave Heights and Total Water Levels*, in ADAPTING TO CLIMATE CHANGE ON THE OREGON COAST, *supra* note 1, at 8–9.

²¹⁴ See Curt Peterson, *Impacts of Predicted Global Sea-level Rise on Oregon Beaches and Tidelands*, 3 JUST CERFING 2 (2012), available at <http://cerf-jcr.com/Just-Cerfing-June-2012.pdf>.

threat of erosion, before the state's authority to protect the public beaches, like the beaches themselves, is eroded away.

Given these acknowledged limitations, it appears that the OPRD should reexamine the standards currently governing the issuance of ocean shore permits.²¹⁵ A reexamination will assist the OPRD and the Commission, as well as the public, in understanding how ocean shore permits will be evaluated and issued in the face of increased coastal erosion resulting from climate change and shoreline development pressures, while preserving the basic principle that a natural shoreline is to be preserved where development did not exist before the adoption of Goal 18. Addressing these issues is necessary to meet the requirements of 2007 Oregon Laws chapter 907 §2(2): “[S]tate and local governments . . . [shall] prepare for the effects of global warming and by doing so, prevent and reduce the social, economic and environmental effects of global warming.”²¹⁶

Above all, the Commission must ensure protection of the public interest in Oregon's beaches for this generation and generations to come, and it appears that the current regulatory regime falls short of the State's policies and goals.

Any restructuring of the ocean shore permit program must consider protection of existing beach widths and buyouts of pre-1977 development. The program must assure adequate beach widths, or sand budgets by littoral subcell that guarantee an ongoing supply of beach sand. The program must also consider how the State is to fulfill its obligation to preserve and protect the public's customary use of its beaches to the vegetation line as it moves.

Regarding the federal flood insurance program, Congress in 2012 enacted further reforms to the FEMA statutes which will assist in

²¹⁵ DLCD and OPRD recognize that their shoreland protection strategy is not adequate. See NOAA COASTAL SERVICES CENTER, BEACHES IN CRISIS: COMPETING USES AND OREGON'S CHANGING COASTLINE: PROPOSAL FOR NOAA COASTAL MANAGEMENT FELLOW, 2013–2015 (2012), available at http://www.csc.noaa.gov/cms/fellows/pdfs/OR_2013.pdf. They are seeking a NOAA fellow for the 2013–2015 period to, among other things: “conduct an analysis of the findings [on armoring] and produce a summary for future ocean shore management decisions and policy making.” *Id.* The hope is that:

[t]he fellow will produce an informative summary of the primary issues that will help the state potentially re-think its shore protection strategy and management in light of known challenges. Known challenges include such things as increased development pressure; changes in erosion due to increased sea level rise, storminess and other climate related factors

Id.

²¹⁶ 2007 Or. Laws 2813 (2007).

climate change adaptation issues. The price of flood insurance will increase.²¹⁷ Second homes will have an immediate increase in premiums of twenty-five percent and subsidies for the flood insurance will be phased out gradually,²¹⁸ with a limit of four for repetitive losses.²¹⁹ Specifically, section 100215(d) of the 2012 Act requires the Technical Mapping Advisory Council (TMAC) to provide recommendations to FEMA within one year on “future conditions risk assessment and modeling,” including “recommendations on how to: (i) ensure that flood insurance rate maps incorporate the best available climate science to assess flood risks; and (ii) ensure that [FEMA] uses the best available methodology to consider the impact of: (I) the rise in sea level; and (II) future development on flood risks”.²²⁰ These recommendations, if well founded, should help LCDC and Oregon’s coastal local governments meet the articulated strategy of coastal-ready communities.

In its 2009 publication, *Climate Ready Communities*, the Department of Land Conservation and Development (DLCD)²²¹ established program objectives for a Coastal Adaptation Strategy, one of which is “to enable coastal local governments to prepare adaptation plans by 2015 to account for the effects of climate change on property, infrastructure, habitat, and resources”²²² Another state agency, DOGAMI, is making progress on identifying hazards and their scope and is making that information available to local governments and private landowners.²²³ It seems unlikely that the

²¹⁷ Some 44,800 policies will have increased rates resulting from the 2012 National Flood Insurance Act changes. *Questions About the Biggert-Waters Flood Insurance Reform Act of 2012*, FED. EMERGENCY MGMT. AGENCY, http://www.fema.gov/media-library-data/20130726-1912-25045-5235/bw12_qa_04_2013.txt (last visited Nov. 7, 2013).

²¹⁸ *Id.*

²¹⁹ *Id.*

²²⁰ The Biggert-Waters Flood Insurance Reform Act of 2012, Pub. L. No: 112-141, §§ 100215(d), 100216(b) (2012).

²²¹ DLCD is the agency of the Land Conservation and Development Commission.

²²² OR. COASTAL MGMT. PROGRAM, OR. DEP’T OF LAND CONSERVATION & DEV., CLIMATE READY COMMUNITIES: A STRATEGY FOR ADAPTING TO IMPACTS OF CLIMATE CHANGE ON THE OREGON COAST (Jan. 2009), available at http://www.oregon.gov/LCD/docs/publications/climate_ready_communities.pdf.

²²³ See, e.g., *Oregon HazVu: Statewide Geohazards Viewer*, DEP’T GEOLOGY & MINERAL INDUS., <http://www.oregongeology.org/hazvu/> (last visited Sept. 29, 2013) (for example, the Coastal Erosion Hazard offers 5 categories: Very High (Active) Hazard Zone, High Hazard Zone, Moderate Hazard Zone, Low Hazard Zone, and NO DATA).

FIRM mapping revisions accounting for climate change, as anticipated in Congress's 2012 legislation, will be completed by 2015. In the run-up to the 2015 target date, the State through LCDC may want to consider encouraging more local governments to participate in FEMA's Community Rating System. The next critical question that needs to be answered by state and local governments is which items of infrastructure need to be moved and which need to be protected from the inevitable wave surges that will occur?

In the future, it is likely that FIRM mapping will need to consider not just the flood fringe line or VE line for flood insurance purposes, but also the line for protection of endangered species, a step that was at least anticipated by Oregon Statewide Planning Goal 17's requirement for consideration of habitat. Two cases illustrate that FEMA may have to modify its lines where endangered species are involved. In *Florida Key Deer v. Paulison*, the Eleventh Circuit Court of Appeals sustained the trial court's injunction preventing the issuance of flood insurance for new development in the suitable habitats of the Florida Key Deer, an endangered species.²²⁴ In a case about the Puget Sound salmon, FEMA was required to consult with the National Marine Fisheries Service regarding both the indirect and direct effects of its mapping, including filling that would allow construction in areas affecting the salmon's habitat.²²⁵ Because of the endangered species listings of these two species and the possible indirect effects of the Flood Insurance Program on development in possible habitats, the court granted injunctions requiring consultation and even prohibition on the sale of flood insurance. Thus, for example, in Oregon, mandatory consultation regarding critical beach habitats where a listed threatened species, the snowy plovers, nests could lead to changes in FEMA's FIRM lines.

In sum, the existing current common law property concepts (e.g., accretion, reliction, and avulsion), statutory law (i.e., Oregon's Beach Bill and its tsunami safety bill), and administrative law (i.e., statewide planning goals and implementing regulations) appear to be inadequate to assure adaptation. Under Oregon's land use laws, local governments have mapped the shorelands as well as beaches and dunes, but since the initial mapping, few changes have been made to reflect dynamic coastal conditions. That said, if the State and coastal

²²⁴ *Florida Key Deer v. Paulison*, 522 F.3d 1133, 1147-48 (11th Cir. 2008).

²²⁵ *Nat'l Wildlife Fed'n v. Fed. Emergency Mgmt. Agency*, 345 F. Supp. 2d 1151, 1176 (W.D. Wash. 2004) (citing 50 C.F.R. § 402.02).

communities are willing to integrate climate change considerations into land use planning, there are several different approaches worth considering.

IV

ROLLING EASEMENTS AND AMBULATORY BOUNDARIES

In an effort to assist coastal states in dealing with the range of physical consequences resulting from climate change coupled with the blizzard of federal, state, and local laws as well as expectations of public and private landowners and users, the Environmental Protection Agency in 2011 published a document entitled *Rolling Easements*.²²⁶ James Titus, the author, defines the term:

A rolling easement is a legally enforceable expectation that the shore or human access along the shore can migrate inland instead of being squeezed between an advancing sea and a fixed property line or physical structure. The term refers to a broad collection of legal options, many of which do not involve easements. Usually, a rolling easement would be either (a) a law that prohibits shore protection or (b) a property right to ensure that wetlands, beaches, barrier islands, or access along the shore moves inland with the natural retreat of the shore.²²⁷

Titus, recognizing that in the long run sea level rise will occur, suggests, among other tools, the use of conservation easements and agreements that use ambulatory boundaries—“boundaries that migrate with a shifting shore.”²²⁸ This seems like a worthwhile idea in addressing the consequences of sea level rise and subsidence on estuarine areas.

Advance planning is critically important given two opposing forces likely to result from climate change. On the one hand, increased storm frequency and intensity, along with sea level rise and decreased summertime precipitation, will put coastal properties, natural areas, and water sources at risk. On the other hand, Oregon’s coastal climate is likely to remain mild, with longer, warmer summers and more temperate winters. As a result, Oregon’s coastal communities may attract “climate refugees” and experience greater in-migration and associated pressures on land use and water resources. At the convergence of these two forces, Oregon’s coastal communities will

²²⁶ TITUS, *supra* note 4.

²²⁷ *Id.* at 7.

²²⁸ *Id.* at 58.

likely see property disappearing as beaches migrate inland, while human population growth increases the demand for land and resources. As a result, it is critical that local cities and counties begin immediately to account for climate change impacts in land use planning and infrastructure development decision making.²²⁹

Defending all development from rising seas will have significant environmental and public safety consequences. For example, hardening shorelines through dikes and seawalls will prevent wetlands from migrating inland and coastal bluffs from retreating landward to widen existing beaches. Further, protecting development in its current location will expose large numbers of people to the hazards of living below sea level. All of this will come at significant cost—likely more than the actual value of the property being protected.²³⁰ An alternative vision for currently undeveloped areas and areas that may be redeveloped would provide for limiting future development of some low-lying coastal lands and susceptible sea cliffs based on the premise that eventually the land must give way to the rising sea. This approach would ensure that wetlands and beaches can migrate inland, protect people and communities from hazards, and be more economically and environmentally feasible.

In place of protecting all development, communities may identify areas where the adaptation strategy will be to retreat, protect, or

²²⁹ The 2009 Oregon Legislature timidly added a suggestion that the “land use program should, but is not required to, help communities . . . manage the effects of climate change.” 2009 Or. Laws 3097 (2009) (codified at OR. REV. STAT. § 197.010(2)(b)).

²³⁰ The potential costs of protection are enormous. The Union of Concerned Scientists, in a 2009 paper reports studies in which the total cost of protection exceeds \$100 billion. UNION OF CONCERNED SCIENTISTS, CLIMATE CHANGE IN THE UNITED STATES: THE PROHIBITIVE COSTS OF INACTION 2-3 (2009), available at http://www.ucsusa.org/assets/documents/global_warming/climate-costs-of-inaction.pdf. It has been estimated that the cost of constructing new seawalls and extending existing ones to protect the continental U.S. urban waterfronts and harbors could exceed \$30 billion (1989 dollars). See Robert E. Deyle et al., *Adaptive Response Planning to Sea Level Rise in Florida and Implications for Comprehensive and Public-Facilities Planning* 8 (Oct. 18, 2007) (unpublished paper presented at the 48th Annual Conference of the Association of Collegiate Schools of Planning in Milwaukee, WI), available at http://www.coss.fsu.edu/durp/sites/coss.fsu.edu.durp/files/WPS_08_02_Deyle.pdf. The cost of three sea gates to protect New York’s waterfront has been estimated at \$10 billion. Beth Buczynski, *Could Giant Rotterdam-Style Floodgates Protect Lower Manhattan from Flooding in Future Superstorms?*, INHABITAT (Nov. 18, 2012), <http://inhabitat.com/nyc/could-building-sized-floodgates-protect-lower-manhattan-from-future-superstorms/> (last visited Nov. 7, 2013).

accommodate sea level rise.²³¹ In retreat areas, planning will allow for the shoreline and wetlands to migrate inland with sea rise and shore erosion. In protection areas, planning will allow development to remain in place and increase protections through seawalls, dikes, or other shoreline protection measures. In accommodation areas, planning will allow existing development to remain without shore protection structures. In these areas, homes would be raised to avoid rising sea levels, allowing both the development to remain and the shoreline migration to occur. To some extent, this type of practice already occurs with regard to floodplain development. However, floodplain mapping is only now beginning to account for the changes in sea level rise and storm wave erosion anticipated with climate change, and it may not account for time frames necessary to incorporate those anticipated changes, such as Greenland and Antarctica ice melts and subduction earthquake-caused tsunamis.

The primary option for retreat has been called a “rolling easement.”²³² In this approach, “human activities are required to yield the right of way to naturally migrating shorelines.”²³³ Grounded in the public trust doctrine (i.e., shorelands held in trust) and common law principles of reliction discussed above, rolling easements can take several forms. Under a regulatory approach, statutes and regulations at the state level, local ordinances and code provisions, or even conditions on development permits could be adapted to address climate change. Using property rights tools, future interests, conservation easements, or restrictive covenants might provide a way to restrict future development of low-lying coastal areas. Other policies such as setbacks, rolling conservation easements, transferrable development rights, or a combination of regulatory and title restrictions might also provide feasible avenues for climate change adaptation.

As discussed above, the existing regulatory framework does not adequately or expressly account for climate change impacts on development. Existing planning frameworks fall short because (1)

²³¹ These strategies are outlined by Titus and others. *See, e.g.*, JESSICA GRANNIS, ADAPTATION TOOL KIT: SEA-LEVEL RISE AND COASTAL LAND USE, GEORGETOWN CLIMATE CENTER (2011).

²³² Deyle et al., *supra* note 230, at 8.

²³³ *Id.* (citing 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, 737).

there are no explicit requirements that state, regional, or local planning entities address sea level rise in land use or infrastructure planning and (2) statutory planning time frames are too short to encompass sea level rise impacts.²³⁴

Some examples of regulation that might more explicitly address this problem include local zoning that restricts shore armoring, state agency regulations that prohibit shore armoring, permit conditions that require public access along the dry beach in return for building permits, or permit conditions that require public access along the inland side of a new shore protection structure in return for permission to build such a structure.

The use of permit conditions to protect public access has been attempted and challenged in California. In *Nollan v. California Coastal Commission*, the state agency granted a permit to replace a small bungalow on a beachfront lot with a larger house, which would block the view from the highway to the beach, on the condition that the landowners allow the public an easement to pass across their beach.²³⁵ The U.S. Supreme Court determined that such a condition would be a lawful land use regulation if it substantially furthered governmental purposes that would justify denial of the permit.²³⁶ The State argued that the permit condition was necessary in order to protect the public's ability to see the beach, prevent beach congestion, and overcome a perceived "psychological" barrier to using the beach.²³⁷ The Court found no relationship between the harm—that is, not being able to see the beach—and the exaction—that is, public access along the beach. It concluded that the State is free to advance a comprehensive land use program to provide beach access through eminent domain and paying for access easements, but it cannot compel coastal landowners to contribute to the goal.²³⁸

A related approach would involve the amortization of nonconforming uses, in which a specified use of a property within a coastal vulnerability zone has an end date after which the use may no longer continue. However, this approach is prohibited in many states and may be interpreted as a regulatory taking requiring compensation.

²³⁴ Reviewers of other states' planning programs have come to similar conclusions. *See, e.g.,* Deyle et al., *supra* note 230.

²³⁵ *Nollan v. Cal. Coastal Comm'n*, 483 U.S. 825, 827-28 (1987).

²³⁶ *Id.* at 834.

²³⁷ *Id.* at 838.

²³⁸ *Id.* at 841.

In fact, many regulatory approaches to rolling easements may face such constitutional challenges. In *Lucas v. South Carolina Coastal Council*, the U.S. Supreme Court articulated the standard for regulatory takings: “Where the State seeks to sustain regulation that deprives land of all economically beneficial use, we think it may resist compensation only if the logically antecedent inquiry into the nature of the owner’s estate shows that the proscribed use interests were not part of his title to begin with.”²³⁹ As discussed in Part I.B.1., under this test, if owning land does not include a right to hold back the sea (or keep a preexisting home on the beach), then a rolling easement regulation is not a taking. If there is a right to hold back the sea from one’s property, a taking will result if the regulation requires the owner to tolerate a permanent physical occupation²⁴⁰ or if the regulation completely eliminates economic value of the property.²⁴¹ And finally, if there is a right to hold back the sea and the regulation does not eliminate all economic value of the property, courts would likely evaluate the regulation by balancing the economic impact against the owner’s reasonable investment-backed expectations.²⁴²

Texas’s attempts to create a rolling shorefront easement through its Open Beaches Law have been tested very recently after severe storm events dramatically shifted the shoreline. In *Severance v. Patterson*, a beachfront property owner on Galveston Island’s West Beach challenged the Act under the Fourth and Fifth Amendments.²⁴³ In 2005, Hurricane Rita caused the tide line to shift inland, leaving the houses on the plaintiff’s properties standing on the dry sand beach area.²⁴⁴ The State asked the property owners to remove the houses pursuant to a public easement along the beach, and one of the

²³⁹ *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1027 (1992). *See supra* Part I.B.1 for the facts of the case.

²⁴⁰ *See Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982).

²⁴¹ *See Lucas*, 505 U.S. at 1034.

²⁴² *See Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978). For further analysis of the takings issue as it relates to rolling easements, *see also* James G. Titus, *Rising Seas, Coastal Erosion, and the Takings Clause: How to Save Wetlands and Beaches without Hurting Property Owners*, 57 MD. L. REV. 1279, 1385 (1998).

²⁴³ *Severance v. Patterson*, 370 S.W.3d 705 (Tex. 2012) (holding, on certification, that there are no rolling easement for access). *See also Severance v. Patterson*, 682 F.3d 360 (5th Cir. 2012) (holding, after certification, that the seizure was improper under the Fourth Amendment to the U.S. Constitution).

²⁴⁴ *Severance*, 370 S.W.3d at 712.

property owners challenged the State's authority to do so.²⁴⁵ The United States Court of Appeals for the Fifth Circuit determined that the Texas courts failed to set forth a consistent rationale for creating or sustaining a rolling beachfront easement, and certified the question to the Texas Supreme Court.²⁴⁶ In March 2012, the Texas Supreme Court issued a decision on the matter.²⁴⁷ First, the court noted the dynamic nature of the ocean shore:

Oceanfront beaches change every day. Over time and sometimes rather suddenly, they shrink or grow, and the tide and vegetation lines may also shift. Beachfront property lines retract or extend as previously dry lands become submerged or submerged lands become dry. Accordingly, public easements that burden these properties along the sea are also dynamic. They may shrink or expand gradually with the properties they encumber.²⁴⁸

The court then addressed the question of how a boundary may "roll" in response to a dramatic shift like that resulting from a hurricane:

[W]hen a beachfront vegetation line is suddenly and dramatically pushed landward by acts of nature, an existing public easement on the public beach does not "roll" inland to other parts of the parcel or onto a new parcel of land. Instead, when land and the attached easement are swallowed by the Gulf of Mexico in an avulsive event, a new easement must be established by sufficient proof to encumber the newly created dry beach bordering the ocean.²⁴⁹

The court held that Texas did not recognize a "rolling" public beachfront easement because the history of land ownership in the area undermined the existence of a public easement by virtue of continuous right in the public since time immemorial (doctrine of custom) for this property given the avulsive nature of the event.²⁵⁰

In Oregon, the requirement for a beachfront protection structure permit is specified as not applying to lands located at an elevation of more than sixteen feet based on the U.S. Geological Survey's 1929 sea-level datum as adjusted in 1947.²⁵¹ Further, the statute requires OPRD to revisit the line periodically and make recommendations for

²⁴⁵ *Id.*

²⁴⁶ *Severance v. Patterson*, 566 F.3d 490 (5th Cir. 2009).

²⁴⁷ *Severance*, 370 S.W.3d 705.

²⁴⁸ *Id.* at 708.

²⁴⁹ *Id.*

²⁵⁰ *Id.* at 724. *See* discussion of the Texas law *supra* notes 44–47.

²⁵¹ OR. REV. STAT. § 390.760 (2011) (using the 1929 Datum, which is now out of date; the 1988 Datum will likely be more accurate).

changes to the Legislative Assembly.²⁵² One such examination dealt with the vegetation line along the New River Spit, which runs parallel to the ocean for several miles and lies south of Bandon, Oregon. This spit has been controversial since the statutory line was established. The dune on the spit has a record of being breached many times between 1939 and 1998, with each breach moving closer to Bandon.²⁵³ The original demarcation of the statutory line was along the east side of the New River. The private riparian landowners petitioned to change the line to provide access for their cattle and keep out the public.²⁵⁴ The matter was largely resolved by public acquisition of a significant amount of the acreage affected.²⁵⁵

The Texas law and the Oregon law provide processes for change in the vegetation line. Oregon's immemorial use, however, is different from that of Texas in that the use has been based on the adjacency to the wet sands area, which itself was used as a highway and recreation area. Further, because of the lack of a coastal highway until the early part of the twentieth century (and the impassibility on uplands in a north-south direction along the Oregon coast due to heavy forestation and almost impenetrable salal growth), the dry sands area to the vegetation line would have moved depending on whether an El Niño storm (every fifteen years or so), or even a tsunami (as occurred in 1700), changed the line.

However, because Oregon's public right to use and access the beach is likewise grounded in the doctrine of custom and not easement, it is possible that any attempt to enforce a "rolling" shorefront might face a similar fate to that of the Texas law. Of course, Oregon is not bound to follow a Texas interpretation of the customary use. Further, the dry sands use associated with highway use, the available evidence about the locations of Native American middens, the thick brush, and difficulties in traversing along the Oregon coast other than on the beach will play a role in the scope of

²⁵² OR. REV. STAT. § 390.755 (2011).

²⁵³ See DIAZ MENDEZ, *supra* note 70, at 98.

²⁵⁴ *Id.* at 93–94.

²⁵⁵ See BLM, U.S. DEP'T OF THE INTERIOR, NEW RIVER AREA OF CRITICAL ENVIRONMENTAL CONCERN MANAGEMENT PLAN (2004), available at http://www.blm.gov/or/districts/coosbay/plans/files/Final_New_River_Plan_Update.pdf.

the “immemorial” custom associated with public use and access to a vegetation line that may move.²⁵⁶

In Oregon, several overarching policies may provide the necessary starting point towards developing more adaptive planning. Some coastal communities already have policies to consider coastal and shoreline impacts of development. These policies fall short because (1) boundaries are generally static, (2) buffers are likely inadequate given projected rates of change, (3) there is no explicit provision for considering climate change, and (4) in most communities, planning staff are not equipped to assess risks.

As a starting point, Oregon communities could directly address climate change within their land use planning policies. For example, in the State of Washington, King County’s 2008 Comprehensive Plan recommends that the county incorporate climate change considerations into plans, programs, and projects: “King County should consider projected impacts of climate change, including more severe winter flooding, when updating disaster preparedness, levee investment, and land use plans, as well as development regulations.”²⁵⁷

This could be accomplished through a goal adoption or amendment process, except that for the Oregon coast, such a requirement should be mandatory on cities and counties.²⁵⁸ Although such a broad requirement does not address specific issues related to climate change, it is possible that an overarching acknowledgement of climate change impacts may serve as a catalyst to bring climate change considerations into some of the existing relevant legal framework.

V

LAW AND CLIMATE CHANGE—ADAPTATION ON THE OREGON COAST

Which lines move and which are fixed? First, sea level rise will cause the line of mean high tide to rise over time. The common law

²⁵⁶ See generally Symposium, *Castles in the Sand: Balancing Public Custom and Private Ownership Interests on Oregon’s Beaches*, 77 OR. L. REV. 913 (1998); Michael C. Blumm & Erika Doot, *Oregon’s Public Trust Doctrine: Public Rights in Waters, Wildlife, and Beaches*, 42 ENVTL. L. 375, 407–12 (2012).

²⁵⁷ KING CNTY., KING COUNTY COMPREHENSIVE PLAN 2008, at 4–17 (2008), available at http://www.kingcounty.gov/~media/property/permits/documents/GrowthManagement/CompPlan2008/Chap4_Environment_adopted08.ashx.

²⁵⁸ The challenges with comprehensive plan amendments are discussed more fully below. See *infra* Part V.D.

doctrines of reliction, accretion, and avulsion remain in place. The Beach Bill's Ocean Shore vegetation line is supposed to move, and a process is in place before the OPRD to cause that line to move, even if there is little evidence of OPRD action in the last forty-five years. Over time, FEMA will cause the VE²⁵⁹ line marking wave erosion levels to move as waves crash into Oregon's bluffs. The evidence is that notwithstanding a shortage of funds, the efforts of DOGAMI to move the tsunami inundation zone line have been successful.²⁶⁰ The Multi-Jurisdictional Natural Hazards Mitigation Plans of Oregon coast counties and cities, with their FEMA imposed five-year update reviews, are causing several hazard evaluations to change. Yet there are serious problems with Oregon's response to coastal climate change adaptation.

The most advanced attempt at adaptation on the Oregon Coast is the Community of Neskowin's plan for adapting to coastal erosion hazards.²⁶¹ Finalized in the spring of 2013, after a three-year process, the Neskowin Citizen Planning Advisory Committee²⁶² report acknowledges "an increasing probability of more severe coastal erosion hazards in the future."²⁶³ The report does not specifically include climate change language, but does acknowledge its effects on the coastal environment. The community planning organization recommended that "planning now to adapt to these hazards and the changing beach environment is prudent and can provide a level of confidence for property owners and beach recreation users facing an

²⁵⁹ See *Definitions of FEMA Flood Zone Designations*, *supra* note 154.

²⁶⁰ In the wake of the 2004 Indian Ocean tsunami, DOGAMI advanced the priority to reexamine tsunami hazards for the entire length of the Oregon coast. Reports of tsunami runup as high as 30 to 35 m near the epicenter of the great Sumatra-Andaman Islands earthquake of 2004 . . . raised the question: could the Cascadia subduction zone produce a wave as large as the devastating Indian Ocean tsunami? The urgency for this reassessment is underscored by the results of a recent study of Oregon's tsunami vulnerability. . . .

Oregon's Tsunami Hazard Mitigation Program (THMP), *supra* note 203.

²⁶¹ NESKOWIN CITIZEN PLANNING ADVISORY COMM., ADAPTING TO COASTAL EROSION HAZARDS: A PLAN FOR THE COMMUNITY OF NESKOWIN, APPENDIX C (2013), available at [http://www.neskowinpac.org/Neskowin%20Land%20Use%20Ordinances%202_13\[1\].pdf](http://www.neskowinpac.org/Neskowin%20Land%20Use%20Ordinances%202_13[1].pdf).

²⁶² The Neskowin Citizen Planning Advisory Committee is a group of citizens who participate in land use decisions in the Neskowin area. CPACs generally fill the role of Neighborhood Associations in unincorporated areas of Oregon counties.

²⁶³ NESKOWIN CITIZEN PLANNING ADVISORY COMM., *supra* note 261, at 2.

uncertain future.”²⁶⁴ The land use components of the plan are grounded in Oregon Statewide Planning Goals 7 (Natural Hazards) and 18 (Beaches and Dunes).²⁶⁵

The Committee ultimately recommends²⁶⁶ the creation of a “Coastal Hazard Zone” and associated permit to address coastal erosion hazards. Within this new zone, a “safest site” standard would be applied to require location of development on the safest portion of a property as determined by a geologic analysis. New “slab-on-grade” foundations would be prohibited, and new structures would be required to be moveable, either vertically or horizontally on the lot, but not off of the lot. The Committee also recommends limitations on land divisions and multifamily dwellings within the hazard zone.

The committee report also suggests changes to the way the county conceptualizes its oceanfront setback line. Currently, the reason for the setback is to protect the views of homes along a uniform line. The Plan²⁶⁷ suggests that perhaps consideration of erosion hazards would be a worthwhile reason for setting an oceanfront setback line. However, it stops short of recommending that amendments to setbacks occur “at this time.” Instead, the recommendation is made that “a 50-year annual erosion rate, plus a 20-foot buffer distance, be utilized for construction on bluff-backed building sites.”²⁶⁸

The Neskowin plan is a step towards adapting to our changing coast. The creation of a coastal hazard zone, within which development will be subject to additional geologic hazard study and restrictions, is an important acknowledgement of the challenges and limitations of developing coastal properties. The inclusion of recommendations as to how to address substantial damage or substantial improvements gets to the question of how to regulate rebuilding after a hazard event. However, even this comprehensive

²⁶⁴ *Id.*

²⁶⁵ See OR. DEP'T OF LAND CONSERVATION & DEV., OREGON'S STATEWIDE PLANNING GOALS & GUIDELINES: GOAL 7: AREAS SUBJECT TO NATURAL HAZARDS, available at <http://www.oregon.gov/LCD/docs/goals/goal7.pdf>; OR. DEP'T OF LAND CONSERVATION & DEV., *supra* note 91.

²⁶⁶ The Plan has not yet been adopted by Tillamook County. In all likelihood, if the Neskowin plan is approved it will be incorporated into the county-wide multi-jurisdictional natural hazard mitigation plan. See 44 C.F.R. § 201.6 (2009).

²⁶⁷ DEP'T OF CMTY. DEV., TILLAMOOK CNTY., THE NESKOWIN COASTAL EROSION ADAPTION PLAN (2013), available at <http://seagrant.oregonstate.edu/sites/default/files/faculty-docs/download/Neskowin-Adaptation-Plan.pdf> (last visited Oct. 6, 2013) (this is the most recent version).

²⁶⁸ NESKOWIN CITIZEN PLANNING ADVISORY COMM., *supra* note 261.

attempt fails to address several critical components of effective planning. For example, the Committee considered, but ultimately did not recommend, a requirement to locate all new infrastructure (roads, water, and sewer lines) landward of the hazard zone. This is in spite of the fact that Neskowin's Hawks Creek Bridge flooded badly during the La Niña winter of 1998–99.²⁶⁹ The Committee likewise stopped short of creating incentives for relocation of structures away from properties already substantially eroded to lower risk areas or from proposals for creation of conservation easements to voluntarily limit development in high risk areas. Finally, the use of a fifty-year annual erosion rate as a setback for bluff-backed development stops short of incorporating new information over time as erosion rates are anticipated to accelerate dramatically in coming years. In order to help more coastal communities take steps as Neskowin has, and perhaps to further support Neskowin's efforts to create more adaptive planning efforts for climate change, the following changes should be addressed.

A. Multi-Jurisdictional Natural Hazards Mitigation Plans Should Be Updated

Currently, the multi-jurisdictional natural hazard mitigation plans that exist do not address the consequences of rapid changes caused by climate change.²⁷⁰ One example is the City of Rockaway Beach in Tillamook County, where “[c]limate change is anticipated to potentially increase the impacts of all other hazards, therefore, climate

²⁶⁹ See NESKOWIN CITIZEN PLANNING ADVISORY COMM., ADAPTING TO COASTAL EROSION HAZARDS: A PLAN FOR THE COMMUNITY OF NESKOWIN, DRAFT REVISION 3 18 (2012), available at <http://neskowincommunity.org/neskowincoastal hazards/Neskowin%20Sub-Plan,%20July%202012,%20Draft,%20Revision%203.pdf>.

²⁷⁰ In fairness, there is progress being made at the federal level that eventually will filter down to states and communities. An example is the changes in the Biggert-Waters Flood Insurance Reform Act of 2012, which contains a requirement for a technical council to use technical experts and scientists to develop recommendations to FEMA on how to ensure FIRM maps incorporate the best available climate science to assess flood risks and how to use the best available methodology to consider the impact of the risk in sea level. See GEORGETOWN CLIMATE CENTER, ANALYSIS OF HOW THE FLOOD INSURANCE REFORM ACT OF 2012 (H.R. 4348) MAY AFFECT STATE AND LOCAL ADAPTATION EFFORTS, available at <http://www.georgetownclimate.org/sites/default/files/Analysis%20of%20the%20Flood%20Insurance%20Reform%20Act%20of%202012.pdf> (last modified Aug. 14, 2012).

change analysis is an ongoing an (sic) action item.”²⁷¹ In addition, such plans still do not take the next step of addressing whether or not public infrastructure (e.g., roads, sewers, electricity, and potable water) will be abandoned or moved to locations outside evident VE or tsunami inundation zones. Rather, as in most situations of natural disasters, there will likely be a reliance on flood insurance and the Stafford Act’s ninety percent money for replacement of infrastructure. Further, the plans reviewed do not seem to address the consequences of subsidence, which is likely to follow a subduction earthquake on the Oregon coast. As the DLCDC’s 2011-2015 Assessment and Strategy under the Federal Coastal Zone Management Act reports: “Existing comprehensive plans do not anticipate climate change impacts and therefore planning and land use decisions and the existing regulatory framework may actually exacerbate potential problems.”²⁷²

Local comprehensive plans are the backbone of the community’s land use policies. Thus, updating local comprehensive plans and multi-jurisdictional natural hazard mitigation plans to include responses to climate change issues should be a priority.

B. CRS Ratings Should Be Met by More Oregon Coastal Communities

While Oregon’s 2009 Climate Ready Communities strategy anticipates a 2015 update, it does not raise the bar for avoiding situations like those in New Orleans’ Ninth Ward’s risky rebuilding decisions. One means of raising the bar is to seek compliance with more features of FEMA’s voluntary Community Rating System (CRS).²⁷³ In the run-up to the 2015 target date, the State through the LCDC may want to consider encouraging more local governments to participate in the FEMA CRS program.

C. Rolling Lines Must Comply with Federal Takings Law

Moving the lines must meet federal takings law standards if Oregon is to avoid compensating for line-moving. Justice Scalia, the majority opinion author of both *Lucas* and *Stop the Beach*

²⁷¹ VLG CONSULTING & SABRINA PEARSON, *Rockaway Beach, Oregon: Local Natural Hazards Mitigation Plan*, in OREGON MULTI-JURISDICTIONAL NATURAL HAZARDS MITIGATION PLAN, *supra* note 161, at 240, 2.

²⁷² OR. COASTAL MGMT. PROGRAM, *supra* note 198, at 113.

²⁷³ See discussion *supra* note 196.

Nourishment, has opined that “*sic utere tuo ut alienum non laedas*” (i.e., so use your own as not to injure another’s property) justifications are not enough nor are mere recitations of public benefits.²⁷⁴ Rather, to pass the federal constitutional muster of no compensation for line changes where all economic use is foreclosed, there must be a showing of “background principles” under state law.²⁷⁵ Notwithstanding Justice Scalia’s dissent in the *Stevens* certiorari denial, Oregon’s Beach Bill with its justification of an immemorial custom of dry sands usage should remain sustainable under current federal constitutional principles.²⁷⁶ Even though there are limits originating in the takings clause on what a city, county, or state can do, if the hazard is clear, it is certainly arguable that the responsible government must do something. While a local government may have discretionary immunity where there is a choice among goals, the Oregon Supreme Court opined that this doctrine does not immunize a decision not to exercise care at all.²⁷⁷ These constitutional concepts must be considered in any legislative process to address climate change.

D. The State and Local Planners Should Revive Periodic Review

Periodic review,²⁷⁸ or the absence thereof, is still another concern. The idea behind periodic review is that populations grow, land and water use considerations change over time, and inventories and rules also change, so local government plans need to change to incorporate these items. Due to funding reductions, lack of prioritization, and an overcomplicated system of review and enforcement, the requirements for periodic review have been reduced. Oregon’s current rule means that on the Oregon coast, only cities with populations over ten thousand must conduct periodic review, and then only every ten years.²⁷⁹ Only Coos Bay and Newport currently meet this criterion, although Astoria is close. In addition, only counties with cities that are required to do periodic reviews (i.e., Coos and Lincoln Counties) need to update their land use documents, and then only for the areas

²⁷⁴ *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1031 (1992).

²⁷⁵ *See id.*

²⁷⁶ *See, e.g., Hay v. Bruno*, 344 F. Supp. 286 (D. Or. 1972).

²⁷⁷ *See, e.g., Vokoun v. City of Lake Oswego*, 335 Or. 19, 31–32, 56 P.3d 396, 403 (2002) (noting that the city did not act to prevent erosion).

²⁷⁸ OR. REV. STAT. § 197.829 (2011).

²⁷⁹ OR. ADMIN. R. 660-025-0030(2)(b) (2013).

within the urban growth boundaries of those cities. Thus, for much of the coast, while beaches, dunes, coastal bluffs, and erosion potential may change, the reviews of Goals 17 and 18 resources expected under periodic review will not happen. The DLCDC recognizes that some of these plans are becoming outdated; “Climate Change Adaptation/Sea Level Rise data, planning and regulations” are recognized in the Oregon Coastal Zone Management Program as “Priority Needs and Information Gaps.”²⁸⁰ More specifically: “The state’s estuary and coastal shorelands planning framework is in need of review and update to respond to changes in habitat, coastal economies and the effects of climate change and sea level rise.”²⁸¹

This is true even though some planning may change as a result of the Multi-Jurisdictional Natural Hazards Mitigation Plan five-year updates under FEMA and Goal 7 requirements, the requirements to update on statutory, goal, or rule changes,²⁸² the changes wrought by FEMA through the Flood Insurance Rate Maps, and DOGAMI’s changes in its hazards and tsunami findings.

The LCDC’s 2012 Periodic Review update does not have one coastal city on its list.²⁸³ The LCDC should rethink the question of periodic review to ensure that climate change adaptation considerations are regularly and effectively integrated into all coastal local government comprehensive plans, zoning, maps, and inventories.

E. Spits and Their Estuaries Deserve Particular Attention

These fragile, dynamic, and ecologically-important areas need to be considered in contemplating climate change effects of beach erosion, tidal inlet widening, and storm wave overtopping as a result of sea level rise. In 1952, the Bay Ocean Spit at Tillamook Bay was breached due to ongoing sand loss or sand displacement within the Tillamook littoral subcell. The north tidal inlet at Garibaldi channel with its two jetties would have been rendered worthless but for a Corps of Engineers intervention to cut off the breach in 1956. However, the Tillamook Bay jetty construction at the beginning of the

²⁸⁰ OR. COASTAL MGMT. PROGRAM, *supra* note 198, at 62.

²⁸¹ *Id.*

²⁸² OR. REV. STAT. § 197.646 (2011).

²⁸³ OR. DEP’T OF LAND CONSERVATION & DEV., LCDC MEETING MINUTES, AGENDA ITEM 3 (Oct. 29, 2012), *available at* http://www.oregon.gov/LCD/docs/meetings/lcdc/111512/Item_3_PR_update.pdf.

twentieth century destroyed the nearby Bay Ocean community on the spit because beach sand displacement in the littoral subcell undercut the spit on which the resort rested.²⁸⁴ The south spit beaches still have not recovered from either the natural or artificial impacts to sand supply in the south Tillamook subcell. The consequence is still-existing lots in the ocean.²⁸⁵ In 1973, the Salishan Spit of Siletz Bay was almost breached and only extensive riprapping prevented it.²⁸⁶ The Nestucca Spit was breached in 1978. Whereas some of the spit breaches recovered after a period, the spits' susceptibility to relatively modest changes in beach sand supply demonstrates the lack of reserve sand supply on most of Oregon's beaches.

At Netarts, the Cape Lookout State Park restroom area on the spit was in danger of being destroyed notwithstanding an extensive pile dike built to protect it.²⁸⁷ Recent archaeological work at the locality has shown an episodic but progressive loss of protective beach sand in the State Park beaches over the last one thousand years.²⁸⁸

The New River Spit was breached more than ten times between 1939 and 1998. Sea level changes coupled with ongoing storm wave erosion require a reexamination of development on sand spits and what is best for the natural resources within the estuary and on the beach. Sand accumulates in bay mouths and beaches that are protected by jetties. Dredging and offshore disposal further redistribute the available sand supply, and in the worst case, increase a net offshore sand loss in the connected littoral cells. These processes deplete the sand available for movement along the Oregon coast within the littoral cells involved.

The Alsea Bay Spit is the site of a development that has had ongoing adverse effects from winds, tides, sand movement, and El

²⁸⁴ See PAUL D. KOMAR, *THE PACIFIC NORTHWEST COAST* 73–92 (1998).

²⁸⁵ See the tax map for Cape Meares, OR. *The Oregon Map GIS Viewer*, ORMAP, <http://www.ormap.net/flexviewer/index.html> (click on the blue pin at the top of the page, and type in "Cape Meares, OR") (last visited on Nov. 7, 2013).

²⁸⁶ See KOMAR, *supra* note 284, at 93–109.

²⁸⁷ See Paul D. Komar, *El Niño and Coastal Erosion in the Pacific Northwest*, 60 *OR. GEOLOGY* 62–63 (May/June 1998), available at <http://www.wou.edu/las/physci/taylor/g331/komar.pdf>.

²⁸⁸ Curt Peterson, *Geologic Notes for Archaeology Site 35TI74 at Cape Lookout State Park, Oregon* (2012) (report submitted to Cape Lookout State Park) (on file with the author of the report).

Niños.²⁸⁹ Several of the rows of homes closest to the south end of the spit are now visible in the active foredune. As a result of the 1982–83 El Niño event, the Alsea Spit was subject to erosion that took four years to stabilize. Lincoln County is anticipating a new FEMA Federal Insurance Rating Map in 2014,²⁹⁰ and this may significantly increase the cost of flood insurance for homeowners on the spit.

It is clear from all of these examples that as a general matter, it is not wise to allow development of sand spits in Oregon. Steps are needed to reclaim this land for protection of the beach and the safety of the persons who have developed this area. A prohibition of further development on sand spits should be part of statewide planning Goal 18. Further, a plan to compensate pre-1977 development owners and convert the sites back to their natural states would save taxpayer money, save lives, and recognize the inevitable adverse consequences of climate change, the Cascadia Subduction earthquake, and a likely tsunami.

At the same time, threats to estuaries and wetlands from sea level rise should be addressed. As sea levels rise, wetlands will convert from one type to another and will need to move inland in order to retain the variety of wetland types that serve important ecosystem functions.²⁹¹ For example, increase in sea level of one meter or more “could turn a high marsh into subtidal habitat and . . . upriver floodplains into the new estuary.”²⁹²

The barriers to wetland migration in estuaries are the same as those for the coastal shore. Hardening of estuary shorelines eliminates upland areas for shallows, mudflats, and marshes as water levels rise. Humans interact heavily with estuaries through construction of dike and ditch systems to convert estuaries to agricultural lands as well as filling and infrastructure construction for residential development. By placing barriers in estuaries, we increase the risk of flooding upstream and limit the potential for dynamic estuary migration. Restoration of estuaries can help increase the resiliency of these ecosystems and help prevent more destructive flooding.

²⁸⁹ See TERRA FIRMA GEOLOGIC SERVS., BAYSHORE DUNE MANAGEMENT PLAN BACKGROUND REPORT (Feb. 7, 2012), <http://www.co.lincoln.or.us/planning/Bayshore%20Fordune%20Management%20Planning/Bayshore%20Background%20Report%20Final%2002-7-12.pdf>.

²⁹⁰ *Id.* at 7.

²⁹¹ See Corrina Chase, *Oregon's Estuaries and Climate Change*, in ADAPTING TO CLIMATE CHANGE ON THE OREGON COAST, *supra* note 1, at 15.

²⁹² *Id.* at 16.

Incorporating concepts of wetland adaptation into local land use planning could take the form of increased setbacks from wetland and riparian areas, conservation easements, and other rolling easement and adaptation tools discussed above in Part IV. Using these planning tools provides the opportunity to accomplish a number of goals, including preventing further loss of wetlands, protecting public and private property from hazards of flood and extreme storm surges, enhancing and protecting water quality and wildlife habitat, and preserving the economic value of estuaries for food production and fisheries.

***F. Construction of Oceanfront Protective Structures for Pre-1977
Developments Should Be Curtailed***

The construction of developed property protection structures on Oregon's beaches is a major concern. The Beach Bill and the implementing rule, as currently construed, seem to allow construction of these protection structures almost regardless of consequences to public access and use of the beach areas.²⁹³ For example, an approval for the Surfrider Resort north of Fogarty Creek was granted, notwithstanding a "safety" finding that: "The beach at this location is typically quite narrow, and the proposed riprap is not expected to obstruct pedestrians or vehicles during low to medium tides. As discussed previously, the beach area is limited or unusable during high tides or during significant storm conditions."²⁹⁴

In the Surfrider Resort riprap findings, there is no analysis of sand movement in the littoral cell, no analysis of the sand budget for the beach, no analysis of alternatives to beach passage at high tide, no analysis of the impacts of near shore currents, and no exaction condition to provide high tide access along the beach or over the beachfront protective structure. In short, State Parks granted the

²⁹³ It appears that at least since 2003, all (seventy) but three ocean protective permit applications have been granted. The three that were denied were all on the basis of insufficient need for the project, *i.e.*, finding no immediate risk to the structures on the property. *See generally Permit Decisions*, OR. PARKS & RECREATION DEP'T, <http://www.oregon.gov/oprd/RULES/pages/regulatory-permitdecisions.aspx> (last visited Nov. 7, 2013).

²⁹⁴ OR. PARKS & RECREATION DEP'T, BA # 674-11, FINDINGS OF FACT: STAFF REPORT, at 5 (2011), *available at* http://www.oregon.gov/oprd/RULES/docs/ba-674-11_surfrider_resort_findings_of_facts.pdf.

permit notwithstanding the Beach Bill's stated policy that it is "in the public interest to protect and preserve" beach access permanently.²⁹⁵

Often, hardening of the shoreline in one location can have the effect of diverting waves to a neighbor's property, worsening erosion on adjacent land. The result is increasingly extended chains of riprap occupying long stretches of Oregon's beaches. As sea level rises, the public area of the beach shrinks as the distance between the tide and the riprap diminishes. Climate change may well result in the loss of up to two hundred feet of width for every one-foot rise in the ocean on the northern Oregon coastal beaches. By the year 2100, the sea level rise may well result in the loss of six hundred feet of beach width in some areas of Oregon's coast. Still, a beachfront property owner concerned with the effects of erosion of a bank or dune can seek a permit to place riprap or a seawall on the beach adjacent to the owner's property. But armoring a beach with riprap or a seawall will stop or impede the natural sand movement in the littoral cell of the beach, reduce access to and along the beach, cover a beach with rock or hardened surface, usually result in additional armoring because the ocean attacks the adjacent properties, result in modifications of habitat, create a false sense of security, and generally benefit only a small number of people at the expense of many.²⁹⁶ In Oregon's Beach Bill, the Legislature confirmed the public's long-standing and uninterrupted use of the beaches and declared it to be in the public interest to protect and preserve such public rights or easements as a permanent part of Oregon's recreational resources. Further, it is "in the public interest to do whatever is necessary to preserve and protect scenic and recreational use of Oregon's ocean shore."²⁹⁷ Thus, if the science is now available to show adverse effects on the public's rights, then the implementation measures must be changed to meet the State's policy.

G. The State Should Adopt Post-Disaster Planning

One missing item in the Multi-Jurisdictional Natural Hazards Plans is post-disaster planning. There is considerable literature on this subject and the state of the Oregon coast.²⁹⁸ There will be significant

²⁹⁵ OR. REV. STAT. § 390.610(2) (2011).

²⁹⁶ DEAN, *supra* note 22, at 33–68.

²⁹⁷ OR. REV. STAT. § 390.610(4) (2011).

²⁹⁸ *See, e.g.* JENNIFER E. PEARCE, CATASTROPHIC POST-DISASTER LONG-TERM RECOVERY PLANNING: A CAPACITY AND NEEDS ASSESSMENT OF THE OREGON COAST

impacts from climate change on beach towns like Rockaway Beach, Cannon Beach, and others.²⁹⁹ To avoid the rebuilding pressure, such as what occurred in New Orleans' Ninth Ward, local governments must choose which areas will not receive restored infrastructure after a major event, like a tsunami or giant wave, and which areas will be redeveloped.

H. The Beach Bill and Goal 18 Implementation Requirement 5 Should Be Strengthened to Protect the Public Interest In Our Shores

These regulatory frameworks and permitting systems are not enough to prevent sand loss, beach narrowing, and failure to protect and preserve Oregon's beaches arising out of construction of beachfront protective structures, such as sea walls and riprap, on the beach. The Legislature specified several "considerations" in granting permits for beachfront protective structures including: (1) "the natural scenic, recreational, and other resources of the area," (2) the "suitability of the area for particular uses and improvements," and (3) "the need for recreation and other facilities and enterprises in the future development of the area and the need for access to particular sites in the area."³⁰⁰ A consideration, legally, merely means there are facts in the record and a finding in the decision document that address the subject of the consideration.³⁰¹ Most land use lawyers regard considerations, such as those in the statute, as a blank check for an agency to do anything it wants to do. The reason is that the courts

(2008), available at https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/8639/TerminalProject_JPearce_06_11_08-1.pdf?sequence=1.

²⁹⁹ See *Oregon HazVu: Statewide Geohazards Viewer*, DEP'T GEOLOGY & MINERAL INDUS., <http://www.oregongeology.org/hazvu/> (to use the viewer, find Tillamook County, indicate in "choose your hazard" box, check flood hazard and coastal erosion hazard. In the "find your house" box, type in Rockaway and use a dummy street, e.g., First Street. Look at the overview in the lower right part of the screen to see where Rockaway is on the Oregon Coasts. (last visited Nov. 4, 2013).

³⁰⁰ OR. REV. STAT. § 390.655 (2011). Land use lawyers in Oregon, including the authors, frequently call "considerations," such as the ones in the Beach Bill, garbage standards—that is, they can mean anything the decider wants them to mean. Author Schell, then a member of the LCDC, recalls that a similar issue arose in connection with LCDC's proposed shorelands goal, which was not adopted in 1974. The proposal was watered down from "should establish" to "should consider." SY ADLER, OREGON PLANS: THE MAKING OF AN UNQUIET LAND USE REVOLUTION 128 (2012).

³⁰¹ Dick Benner made a similar criticism of an early draft of the Coastal goals. ADLER, *supra* note 300, at 214.

generally hold that so long as the findings made by the agency in a particular decision expressly address each of these considerations, the agency can decide however it chooses to decide. While federal agencies are bound to take a “hard look” at these kinds of considerations, at least for Environmental Impact Statement reviews,³⁰² we know of no such requirement under Oregon law. Such considerations are in stark contrast to “clear and objective” standards as specified in the land use laws.³⁰³ It is worthwhile for the Legislature to change the statute’s “considerations” to standards that account for the increased scientific knowledge regarding littoral cells, sand budgets and movement, beach widths, rip currents, and climate change effects.

Complicating the Beach Bill’s permitting plan is a requirement from another agency, the LCDC. Implementation Requirement 5 of the Beaches and Dunes Goal allows beachfront protective structures only for development that existed on January 1, 1977. The requirement specifies the criteria for review of beachfront protective structures as minimizing visual impacts, maintaining access to the beach, avoiding negative impacts on adjacent property, and avoiding costs to the public.³⁰⁴ Again, these criteria lack sufficient standards to account for the increased scientific knowledge regarding littoral cells, sand movement, beach widths and retreats, and climate change effects. Access to the beach is only one point in the “protect and preserve” policy of the State; access along the beach to the maximum extent practicable would better suit the state policy.

³⁰² See, e.g., *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976).

³⁰³ See, e.g., OR. REV. STAT. § 197.015(10)(b)(B) (2011).

³⁰⁴ Statewide Planning Goal Implementation Requirement 5 states:

Permits for beachfront protective structures shall be issued only where development existed on January 1, 1977. Local comprehensive plans shall identify areas where development existed on January 1, 1977. For the purposes of this requirement . . . “development” means houses, commercial and industrial buildings, and vacant subdivision lots which are physically improved through construction of streets and provision of utilities to the lot and includes areas where an exception . . . has been approved. The criteria for review of all shore and beachfront protective structures shall provide that: (a) visual impacts are minimized; (b) necessary access to the beach is maintained; (c) negative impacts on adjacent property are minimized; and (d) long-term or recurring costs to the public are avoided.

OR. DEP’T OF LAND CONSERVATION & DEV., *supra* note 90, at 2. There has been some interpretation of this IR; one case held that just because there was one house on an 11-acre parcel, construction of a beachfront protective structure need not be allowed anywhere on the parcel. *Regen v. Lincoln Cnty.*, 49 Or. LUBA 386 (2005).

The most well-known application of the Beaches and Dunes Goal's Implementation Requirement 5 involved The Capes, a recreational resort with homes built after 1977 on a sandy bluff on the northern side of Netarts Bay.³⁰⁵ The 1997–98 El Niño caused beach storms with waves from the southwest that started to erode the sand at the base of the bluff, with the vertical drop growing from eighteen inches to five feet within a matter of four days. The owners desired to place a beachfront protective structure at the base of the bluff to stop the erosion that would include the placement of thirty thousand cubic yards of bouldered riprap on the beach at the toe of the bluff. The county denied the application. Tillamook County determined that it “in good conscience, without better certainty, cannot allow structural support stabilization of The Capes dune if the effect of those actions would be to cause erosion to other properties and negatively impact our beaches.”³⁰⁶ In the end, a tieback system was permitted along the top of the bluff involving horizontally inserted steel rods covered with wire mesh and textured concrete with minimal visual and beach access impacts.

Given The Capes incident, the concern for the beach, the sand, and access along the beach at all tides centers around beachfront protective structures requested for property developed prior to 1977. This is much of the privately held portions of the Oregon coast where there is beach. As climate change becomes more noticeable, two sets of issues exist: access along the beach at higher tides and sand movement within each beach littoral subcell.

The OPRD's rule is somewhat more forceful than the Beach Bill's language. For beachfront protection structure applications to be approved by the OPRD, there are General Standards, Scenic Standards, Recreation Use Standards, Safety Standards, and Natural and Cultural Resource Standards. They cover provisions necessary to protect the affected area from any use, activity, or practice that is not in keeping with the conservation of natural resources or public recreation and to determine “the suitability of the area for particular uses and improvements (This may include bank alignments, topography, shoreline materials and stability, width of the beach, past

³⁰⁵ The story is told best by the then Tillamook County planning director, Vic Affolter. See Vic Affolter, *Lessons from the Capes: A Case Study*, in ADAPTING TO CLIMATE CHANGE ON THE OREGON COAST, *supra* note 1, at 61.

³⁰⁶ See *id.* at 63.

erosion, storm water levels, sand movement, water currents, adjoining structures, beach access, land uses, etc.)”³⁰⁷ The application procedure for a beachfront protection structure involving riprap or a seawall over fifty feet requires a technical report of a licensed professional geologist, and it also requires a showing of “no alternatives” to invading the beach. However, there is no technical review of the report; thus, anything it says is substantial evidence sufficient to support any decision desired by the OPRD.³⁰⁸

Another major problem has to do with property developed before January 1, 1977, that is “in imminent peril of being destroyed or damaged by action of the Pacific Ocean.”³⁰⁹ In such a situation, the OPRD may ignore the “considerations” of the statute, most of the requirements of Goal 18, Implementation Requirement 5, and standards in the rules.³¹⁰ One of the conditions is that the recipient of a temporary permit must apply for an after-the-fact permanent permit.³¹¹ But we know of no situations where an after-the-fact permit application for a beachfront protective structure has been denied. Given the climate change adaptation efforts necessary, it may be time for the Legislature and the OPRD to revisit these emergency situations and plan for them, taking into consideration the legislative commitments to uninterrupted use of the beaches and their protection and preservation.

³⁰⁷ OR. ADMIN. R. 736-020-0005 (2013).

³⁰⁸ Public outcry is not enough. *See, e.g.*, OR. PARKS & RECREATION DEP’T, BA # 612-06, FINDINGS OF FACT: STAFF REPORT (2011), available at http://www.oregon.gov/oprd/RULES/docs/ba_612_06vanradensoderholmsurfsidefindings.pdf. If a riprap is less than 50 feet, then no professional report is required. *See* OR. ADMIN. R. 736-020-0003. Even if a professional report is required, practitioners representing clients opposing a permit find it extremely difficult before the OPRD to challenge the report without the expense of hiring a countervailing geologist. In the Capes situation, it has been said (and this could be confirmed by review of the record in the land use proceeding) that there were several professional geologists with reports, each with a setback from the bluff line that was closer than the one before. Notwithstanding those licensed professional geologists engaged in the public practice, whose professional code includes, “to the fullest extent possible, a geologist shall protect the public health and welfare and property in carrying out professional duties,” OR. ADMIN. R. 809-020-001, geologists work for developers and if their reports don’t help the developer maximize the use of land, their reports are ignored, they are not rehired, and their reputations suffer among those who hire them. One way to counteract this natural human trait is to ask the permit applicant not only to provide a qualified, licensed professional geologist’s report but also to pay the local or state government’s costs for a professional review.

³⁰⁹ OR. ADMIN. R. 736-020-0050(1) (2013).

³¹⁰ OR. REV. STAT. § 390.650(6) (2011); OR. ADMIN. R. 736-020-0050 (2013).

³¹¹ OR. ADMIN. R. 736-020-0070(3) (2013).

Thus, the Legislature needs to revisit the various considerations, standards, and criteria for beachfront protective structures in light of the current science available regarding the impacts of climate change on Oregon's beaches. Specifically, standards (not considerations) the Legislature should enact include:

- a. A limitation on the lifetime of the beachfront protective structure;
- b. No interference with access along the beach during any time other than a spring tide;³¹²
- c. Removal of the beachfront protective structure when the mean higher high tide reaches the installed beachfront protective structure;
- d. Recognition of the movability of the vegetation line;
- e. No right to maintain, repair, or expand the beachfront protective structure after the property has changed hands;
- f. No cumulative loss of sand in the littoral cell from past, present or future development in excess of 10%; and
- g. No impediment to sand movement in the littoral cell involved, both from the project under consideration and cumulatively for the littoral cell.

With these standards, the issues of climate change adaptation will be more appropriately addressed while fulfilling the public's right to use the dry sands on Oregon's beaches to the limits of the vegetation line.

CONCLUSION

Planning for climate change adaptation on the Oregon coast requires revisiting the Beach Bill, Goals 17 and 18, and expectations regarding public and private property and infrastructure, given the State's unique tectonic, hydrological, geological, and ownership concerns. With its special planning experience and relationship with its coast, the State as a whole, its people, and its governmental entities need to decide what ought to be preserved and acknowledge what is likely to be swept away by the natural processes on the coast as a

³¹² Many other states protect access along the beach itself. Such action is necessary due to sea level rise and the ocean shore permit process. Yet the statute, the rule and the Oregon Parks and Recreation Department's 2005 Ocean Shore Management Plan fail to address this vital issue. See OR. PARKS & RECREATION DEP'T, *supra* note 81.

result of climate change. Processes are needed to decide what infrastructure will be replaced and what will not before these inevitable events occur. Mitigation funds are available from FEMA and through the Stafford Act, and they need to be used to ameliorate the inevitable losses that will occur from the effects of climate change as well as from tsunamis and subsidence of the ground surface. Planning can ensure that shoreline armoring does not eliminate public access along the shore or total loss of sand on Oregon's beaches. Planning tools can make clear that the public access boundary does migrate inland, even if the shoreline migrates onto an inland parcel across which the public does not currently have access. It is clear that Oregon's current tools are not adequately adapted to deal with rapidly changing conditions on the coast, as even the State itself has acknowledged. In order to protect the legacy of public coastal access in Oregon, state agencies and local governments must begin to take steps to address climate change impacts head-on and reconcile these changes with the modern concepts of property rights and boundaries.