

OF SEA LEVEL RISE AND SUPERSTORMS: THE PUBLIC HEALTH POLICE POWER AS A MEANS OF DEFENDING AGAINST “TAKINGS” CHALLENGES TO COASTAL REGULATION

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INTRODUCTION

Climate change is affecting our coasts.¹ Specifically, sea

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levels are rising²—faster in some places than others.³ As the Intergovernmental Panel on Climate Change (IPCC) reported in the final draft of the 2014 Fifth Assessment Report, varying local factors such as subsidence or uplifting, sediment transport, and the extent of coastal development means that different coastal locations will experience potentially significantly greater or lesser sea level rise.⁴ Nevertheless, “[c]oastal systems and low-lying areas will increasingly experience adverse impacts such as submergence, coastal flooding and coastal erosion due to relative sea level rise (*very high confidence*). Beaches, sand dunes, and cliffs currently eroding will continue to do so under increasing sea level (*high confidence*).”⁵ While the relationship between sea level rise, coastal storms, and storm surge is more complex,⁶ it is clear that the interaction of coastal storms and sea level rise poses threats to coastal communities. Indeed, coastal inundation was the first “key risk” from climate change that the IPCC identified in 2014—specifically, the “[r]isk of death, injury, ill-health, or disrupted livelihoods in low-lying coastal zones and small island developing states and other small islands, due to storm surges, coastal flooding, and sea-level rise.”⁷

The reality for law and policy in the 21st century, therefore, is that the sea is invading the land in many coastal locations—gradually at all times but also with increasing risks of catastrophic flooding, such as the flooding Hurricane Sandy caused along the northeast coast of the United States in 2012 and Hurricane Katrina

¹ U.S. ENVTL. PROT. AGENCY, *Climate Change Indicators in the United States: Sea Level*, <http://www.epa.gov/climatechange/science/indicators/oceans/sea-level.html> (last updated Sept. 13, 2013) (“Relative sea level rose along much of the U.S. coastline between 1960 and 2012, particularly the Mid-Atlantic coast and parts of the Gulf coast, where some stations registered increases of more than 8 inches.”).

² *Id.*

³ *Id.*

⁴ Poh Poh Wong & Inigo J. Losada, *Coastal Systems and Low-Lying Areas* 3, in INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FINAL DRAFT: CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY (2014), available at http://ipcc-wg2.gov/AR5/images/uploads/WGIAR5-Chap5_FGDall.pdf [hereinafter 2014 IPCC Coastal Systems] (pending approval of the full IPCC).

⁵ *Id.* at 2.

⁶ *Id.* at 3.

⁷ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY: SUMMARY FOR POLICYMAKERS 12 (2014), available at http://ipcc-wg2.gov/AR5/images/uploads/IPCC_WG2AR5_SPM_Approved.pdf [hereinafter 2014 IPCC SUMMARY FOR POLICYMAKERS].

caused in New Orleans in 2005. Moreover, the risks to humans from coastal inundation will probably only increase into the future: “Climate-change-related risks from extreme events, such as . . . coastal flooding, are already moderate (*high confidence*) and [will become] high with a 1°C additional warming (*medium confidence*).”⁸

Both the reality of sea level rise and the increased risk from severe storms call for new coastal management responses. To date, however, most of these responses have been framed—logically enough—as land use planning.⁹ Specifically, coastal states have been experimenting with coastal retreat,¹⁰ rolling easements,¹¹ building moratoria in the coastal zones,¹² perpetual easements,¹³ and other land use-based approaches that both anticipate and react to coastal inundation.

While measures framed as “land use planning” might, in a vacuum, be appropriate and effective legal responses to the actuality and threat of coastal inundation, on the ground they often interfere with how owners can use coastal private property. In turn, property owners affected by coastal regulation often sue the responsible state or municipality, claiming that the government has unconstitutionally “taken” their property in violation of the Fifth¹⁴ and Fourteenth¹⁵ Amendments to the U.S. Constitution and/or similar provisions in the relevant state’s constitution.¹⁶ These constitutional provisions ensure that state and local governments

⁸ *Id.* at 13 Assessment Box SPM.1 (emphasis added to “coastal flooding”).

⁹ See, e.g., *Palazzolo v. Rhode Island*, 533 U.S. 606, 607 (2001) (characterizing Rhode Island’s regulation of coastal wetlands as land use regulation).

¹⁰ See generally, e.g., Andrew C. Revkin, *Can Cities Adjust to a Retreating Coastline?*, N.Y. TIMES (Aug. 22, 2013), <http://dotearth.blogs.nytimes.com/2013/08/22/can-cities-adjust-to-a-retreating-coastline> (discussing the need for coastal retreat or “managed retreat” in the aftermath of Hurricane Sandy).

¹¹ See, e.g., *Severance v. Patterson*, 370 S.W.3d 705, 721 (Tex. 2012) (describing the “rolling easement” concept in connection with Texas’s Open Beaches Act).

¹² See, e.g., *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1007–09 (1992) (describing the coastal development restrictions in South Carolina).

¹³ See, e.g., *Milgram v. Ginaldi*, No. C-264-06, 2008 WL 2726727, at *1–4 (N.J. Super. Ct. App. Div. July 15, 2008) (describing the New Jersey Department of Environmental Protection’s attempt to use perpetual easements to implement the New Jersey Shore Protection Project).

¹⁴ U.S. CONST. amend. V.

¹⁵ U.S. CONST. amend. XIV, § 2.

¹⁶ E.g., LA. CONST., art. 1, § 4(B)(1).

cannot take private property for public use without just compensation.

As perhaps best exemplified by the U.S. Supreme Court's decision in *Lucas v. South Carolina Coastal Council*,¹⁷ these takings claims sometimes succeed. However, even unsuccessful takings claims cost money to defend against, and the threat of takings litigation can "chill" the willingness of state and local governments to engage in innovative coastal management. While successful takings claims are to be expected when a state's coastal regulation effectuates a *physical* taking of coastal properties, the traditional purview of the Takings Clauses, the U.S. Constitution's prohibition on takings without compensation also has long incorporated a *regulatory* takings doctrine,¹⁸ as have most state constitutions.¹⁹ Moreover, the land use police power is no longer a defense—as it once was—to land use-based regulatory takings claims. As a result, courts can deem state coastal regulation to be a taking of private property under the regulatory takings doctrine despite significant links between coastal regulation, public safety, and the necessity of dealing with climate change.

Importantly, however, as a practical matter neither courts nor the general public treat all state exercises of the police power the same. In courts, state regulation that directly protects the public health from traditional and imminent public health concerns (disease, toxic exposures²⁰) provides states—de facto if admittedly only rarely *de jure*—with more effective insulation from

¹⁷ 505 U.S. 1003 (1992).

¹⁸ The Supreme Court's regulatory takings doctrine is usually traced to *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922), where the Court famously announced that "[t]he general rule at least is that while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking." *Id.* at 415.

¹⁹ See, e.g., *Edwards Aquifer Auth. v. Bragg*, No. 04-11-0018-CV, 2013 WL 5989430, at *4 (Tex. Ct. App. Nov. 13, 2013) (evaluation of a regulatory takings claim under the Texas Constitution); *Lemire v. Dep't of Ecology*, 309 P.3d 395, 403 (Wash. 2013) (discussing a debate among the parties and amici on regulatory takings analyses under the federal and state constitutions).

²⁰ As Professor Ilya Somin cogently demonstrated elsewhere during this conference (see *supra* note *), government "public health" rationales can justify a variety of land use regulatory mechanisms, including urban renewal. My argument relies not on the government's verbal recitation of a "public health" mantra, but rather on a clear substantive connection, easily cognizable by courts, between government regulation on the coast and the traditional subjects of public health measures—the prevention of disease, the prevention of poisoning, reductions of toxic exposures, and to some extent the prevention of mass injuries or deaths from accidents.

regulatory takings claims. At the same time, when states clearly regulate to protect traditional notions of threats to the public health, that regulation often enjoys more popular support than land use regulation, even among those individuals whom the regulation most impacts.

To date, however, no coastal state has seriously framed its legal measures to deal with coastal inundation as public health protection. Nevertheless, the public health threats posed by coastal inundation—both slow sea level rise and catastrophic storms—are real and numerous.

This article argues that coastal states would gain considerable advantage in responding to constitutional regulatory takings challenges if they framed legal measures to deal with coastal inundation as public health regulation. It begins by reviewing the increased inundation threats to coastal areas from climate change, coastal states' efforts to address these new issues, and the litigation track record of constitutional takings challenges opposing these states' regulatory innovations. It then reframes coastal inundation as a public health problem, examining the public health threats that sea level rise and coastal storms pose to coastal communities. Finally, it reviews the courts'—and especially the U.S. Supreme Court's—treatment of land use-based and more traditionally public health-based regulation, demonstrating that, as a practical if not always fully articulated legal matter, traditional public health regulation—even public health-based regulation that affects land use—fares better against regulatory takings challenges than land use-based regulation. As a result, regulation of coastal inundation based in traditional public health rationales—prevention of disease, reduction of toxic exposure, prevention of mass injuries and mass deaths—should also fare better than the land use-framed attempts to date, particularly if states are regulating to prevent or lessen the public health impacts of severe coastal storms.

I. THE NEED TO DEAL WITH RISING SEAS AND COASTAL STORMS VERSUS THE TRACK RECORD OF “TAKINGS” CHALLENGES TO COASTAL REGULATION

A. *Constitutional Takings Law and Coastal Takings Claims in the U.S. Supreme Court*

Coastal regulation has long and repeatedly been the subject of constitutional claims that the regulating government (almost

always a coastal state) has taken private property without just compensation. At the federal level, the Fifth and Fourteenth Amendments to the U.S. Constitution prohibit the taking of private property for public use without compensation by, respectively, the federal and state/local governments.²¹ Until 1922, this prohibition on uncompensated takings of private property was limited to governments' physical takings—for example, the condemnation of private land for a public road or a government building.²² In 1922, however, the U.S. Supreme Court decided *Pennsylvania Coal Co. v. Mahon*²³ and recognized that state and local *regulation* might also amount to an unconstitutional taking of private property. As Justice Oliver Wendell Holmes articulated in that decision, “while property may be regulated to a certain extent, if regulation goes too far it will be recognized as a taking.”²⁴

Since *Pennsylvania Coal*, the U.S. Supreme Court has recognized three categories of constitutional takings: (1) physical takings of property, which require compensation in all circumstances,²⁵ (2) a small category of *per se* regulatory takings,²⁶ where the regulation deprives the landowner of all economic use of the land, which also automatically require compensation,²⁷ and (3) the much larger category of alleged regulatory takings that merely deprive the owner of some (but not all) uses of or value from the property.²⁸ For takings claims based on the Federal Constitution, courts evaluate regulatory takings claims in this last category through the three-part balancing test that the U.S. Supreme Court established in *Penn Central*

²¹ U.S. CONST. amends. V, XIV, § 1. See also *Dolan v. City of Tigard*, 512 U.S. 374, 383–84 (1994); *Keystone Bituminous Coal Ass’n v. DeBenedictis*, 480 U.S. 470, 481 n.10 (1987) (both confirming that the taking prohibition applies to state and local governments through the Due Process Clause of the Fourteenth Amendment).

²² ROBIN KUNDIS CRAIG, THE CLEAN WATER ACT AND THE CONSTITUTION: LEGAL STRUCTURE AND THE PUBLIC’S RIGHT TO A CLEAN AND HEALTHY ENVIRONMENT 149 (2d ed. 2009).

²³ 260 U.S. 393 (1922).

²⁴ *Id.* at 415.

²⁵ *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1015 (1992); *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 435–41 (1982).

²⁶ See *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg’l Planning Agency*, 535 U.S. 302, 325 n.19 (2002) (noting that “*Lucas* carved out a narrow exception to the rules governing regulatory takings for the ‘extraordinary circumstance’ of a permanent deprivation of all beneficial use.”).

²⁷ *Lucas*, 505 U.S. at 1019, 1029, 1031–32.

²⁸ *Tahoe-Sierra Pres. Council*, 535 U.S. at 323–24.

*Transportation Co. v. City of New York*²⁹: (1) “The economic impact of the regulation on the claimant”; (2) “the extent to which the regulation has interfered with distinct investment-backed expectations”; and (3) “the character of the governmental action.”³⁰

Recent coastal takings litigation that has reached the U.S. Supreme Court demonstrates the complexity of this jurisprudence. The *Lucas* Court, for example, evaluated whether South Carolina’s 1988 Beachfront Management Act effected a regulatory taking of Lucas’s coastal property.³¹ The parties conceded (probably unwisely, as it turned out) that application of the Act essentially prohibited all development of plaintiff Lucas’s beachfront property and hence destroyed all of its economic value,³² and the Court eventually concluded that “[w]here 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.”³³ Specifically, when a state or local government enacts legislation that prohibits “all economically beneficial use of land”:

Any limitation so severe cannot be newly legislated or decreed (without compensation), but must inhere in the title itself, in the restrictions that background principles of the State’s law of property and nuisance already place upon land ownership. A law or decree with such an effect must, in other words, do no more than duplicate the result that could have been achieved in the courts—by adjacent landowners (or other uniquely affected persons) under the State’s law of private nuisance, or by the State under its complementary power to abate nuisances that affect the public generally, or otherwise.³⁴

As a result, to have a defense against *per se* regulatory takings, the state had to identify “background principles” of

²⁹ *Id.* at 315 n.10 (citing *Palazzolo v. Rhode Island*, 533 U.S. 606, 617 (2001)).

³⁰ *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978).

³¹ *Lucas*, 505 U.S. at 1008–09 (quoting S.C. CODE ANN. § 48-39-280(A)(2) (Supp. 1988)).

³² *Id.* at 1009.

³³ *Id.* at 1027. But see *Palazzolo*, 533 U.S. at 631–32 (rejecting the plaintiff’s “total deprivation” takings claim in the context of coastal wetlands regulation).

³⁴ *Lucas*, 505 U.S. at 1029 (footnote omitted).

property law that already prohibited Lucas's activities.³⁵ Besides nuisance, the *Lucas* Court explicitly identified the federal navigation servitude³⁶ and the doctrine of public necessity³⁷ as appropriate "background principles" of state property law. State public trust doctrines are another potential set of "background principles" that could insulate state coastal regulation from constitutional takings claims,³⁸ as are the inherent state complexities—generally denominated riparian or littoral rights—that accompany coastal properties.

Florida took full advantage of this last set of "background principles" of state coastal property law to defend its beach renourishment program from constitutional takings claims. Although both the facts and the law at issue in *Stop the Beach Renourishment, Inc. v. Florida Department of Environmental Protection*³⁹ were complicated, essentially, Florida's 1961 Beach and Shore Preservation Act allowed the state to establish an "erosion control line" in publicly funded beach renourishment projects that appeared to change a littoral owner's common law rights to take title to beach accretions and to touch the water.⁴⁰ Specifically:

Once the erosion-control line is recorded, the common law ceases to increase upland property by accretion (or decrease it by erosion). [FLA. STAT.] § 161.191(2). Thus, when accretion to the shore moves the mean high-water line seaward, the property of beachfront landowners is not extended to that line (as the prior law provided), but remains bounded by the permanent erosion-control line.⁴¹

However, the U.S. Supreme Court reviewed the Florida Supreme Court's pronouncements on littoral property rights to conclude that no taking had occurred because Florida law treated beach

³⁵ *Id.* at 1031–32.

³⁶ *Id.* at 1028–29 (quoting *Scranton v. Wheeler*, 179 U.S. 141, 163 (1900)).

³⁷ *Id.* at 1029 n.16. For a discussion of potential public necessity defenses to coastal sea level rise "takings" liability, see Robin Kundis Craig, *Public Trust and Public Necessity Defenses to Takings Liability for Sea Level Rise Responses on the Gulf Coast*, 26 J. LAND USE & ENVTL. L. 395, 419–31 (2011).

³⁸ For a discussion of public trust doctrine defenses to takings claims, see Craig, *supra* note 37, at 403–19. For an interesting decision showing some of the procedural complexities that can arise in a public trust doctrine case, see *Fabrikant v. Currituck Cnty.*, 621 S.E.2d 19, 27–28 (N.C. Ct. App. 2005).

³⁹ *Stop the Beach Renourishment, Inc. v. Fla. Dep't of Envtl. Prot.*, 560 U.S. 702 (2010).

⁴⁰ *Id.* at 709.

⁴¹ *Id.* at 710.

renourishment as an avulsion, not an accretion,⁴² leaving the property line where it had been—and where the regulatory erosion control line established it.⁴³ As the U.S. Supreme Court concluded, “The Takings Clause only protects property rights as they are established under state law, not as they might have been established or ought to have been established. We cannot say that the Florida Supreme Court’s decision eliminated a right of accretion established under Florida law.”⁴⁴

Other state coastal management laws have not fared as well as Florida’s, however. Moreover, somewhat perversely, both states’ failures to act in the face of sea level rise and especially coastal storms⁴⁵ and their attempts to better manage the coastal zone⁴⁶ have been subjected to constitutional takings litigation. It is to these other takings claims that this article now turns.

B. State Coastal Regulation, Physical Takings Claims, and Public Necessity

Some state attempts to better manage the coastal zone or to rebalance public and private rights near the coastline amount to physical takings of private property, demanding compensation. Thus, for example, in 1999 the Supreme Court of New Hampshire held that the state legislature had effected a physical taking of coastal property rights when it extended the public trust doctrine to recognize the public’s right to use the beach inland to the highest high water mark (extended from public use to the ordinary high water mark), effectively allowing the public to use property that had previously been considered entirely private.⁴⁷ Similarly, the New Jersey Superior Court found that when the New Jersey Department of Environmental Protection attempted to create, in

⁴² “Avulsion” refers to “a sudden removal of land caused by change in a river’s course or by flood,” whereas “accretion” is the “gradual accumulation of land by natural forces” on the bank of a river or on the seashore. BLACK’S LAW DICTIONARY 147, 22 (8th ed. 2004).

⁴³ *Stop the Beach Renourishment*, 560 U.S. at 729–33.

⁴⁴ *Id.* at 732.

⁴⁵ E.g., *Kitchen v. City of Newport News*, 485 F. Supp. 2d 691, 692–94 (E.D. Va. 2007) (dismissing as unripe property owners’ constitutional “takings” claims against the city based on the city’s failure to maintain storm drains and pipes in the wake of Hurricane Floyd in 1999).

⁴⁶ E.g., *Severance v. Patterson*, 370 S.W.3d 705, 722–25 (Tex. 2012) (upholding a “takings” claim against the State of Texas’s assertion of a “rolling public easement” in Texas beaches damaged by hurricanes).

⁴⁷ *Purdie v. Att’y Gen.*, 732 A.2d 442, 447 (N.H. 1999).

cooperation with the U.S. Army Corps of Engineers, a perpetual easement over private property to implement the New Jersey Shore Protection Project, that attempt “amounted to a taking of private property without just compensation”⁴⁸ that required the use of eminent domain.

As suggested by the U.S. Supreme Court’s tripartite scheme for constitutional takings, a public health rationale is generally irrelevant to a private property owner’s claim of a physical taking.⁴⁹ Instead, in physical takings cases, usually all that matters is whether the government physically occupies,⁵⁰ takes title to,⁵¹ or allows public invasion of the property.⁵² If so, compensation is automatically required.

Nevertheless, even in the physical takings analysis, it is important to remember that an imminent and substantial threat to public health or public safety can give governments a public necessity defense, justifying both the destruction of private property without compensation and other invasions of private rights (such as through quarantine).⁵³ It remains to be seen whether and how states will evolve their common-law doctrines of public necessity in the face of coastal inundation and climate change impacts more generally. So far, however, this defense to physical takings claims remains latent and circumscribed, even when governments act in direct response to coastal storms.⁵⁴ For

⁴⁸ Milgram v. Ginaldi, No. C-264-06, 2008 WL 2726727, at *4 (N.J. Super. Ct. App. Div. July 15, 2008). Other improvements of the coast have also been found to cause physical takings of private property, including, unusually, the U.S. Army Corp of Engineers’ installation and maintenance of harbor jetties and piers along the coast of Lake Michigan, which caused erosion of adjacent landowners’ beachfront properties. See Banks v. United States, 78 Fed. Cl. 603, 656 (2007).

⁴⁹ See, e.g., Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1015 (1992) (describing compensation as “automatic” in a physical takings case and hence indicating that the purpose of the government action is irrelevant if a physical taking occurs).

⁵⁰ “When the government physically takes possession of an interest in property for some public purpose, it has a categorical duty to compensate the former owner, regardless of whether the interest that is taken constitutes an entire parcel or merely a part thereof.” Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg’l Planning Agency, 535 U.S. 302, 321–323 (2002) (internal citation omitted).

⁵¹ Yee v. City of Escondido, 503 U.S. 519, 522 (1992) (citing Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419, 458 (1982)).

⁵² McKenzie v. City of White Hall, 112 F.3d 313, 317 (8th Cir. 1997).

⁵³ See Craig, *supra* note 37 (discussing the public necessity defense).

⁵⁴ See *id.* at 430–31 (discussing the potential use of state public necessity doctrines as defenses to takings claims).

example, in the wakes of Hurricanes Rita and Katrina in 2005, the U.S. Army Corps of Engineers in 2006 made use of Louisiana's Homeland Security and Emergency Assistance and Disaster Act⁵⁵ and a Commandeering Order from the President of Plaquemines Parish to extract 383,871 banked cubic yards of clay from an 18.3-acre excavation site and to store and process the excavated clay on an adjacent 25.8-acre plot of land, both owned by National Food and Beverage Company,⁵⁶ for use in repairing the levees damaged by the storms. National Food subsequently won its physical takings claim against the United States and was awarded \$1,251,774.75 in compensation.⁵⁷ As a matter of public policy, the result may be unobjectionable, and, indeed, in the cooperation agreements between the Army Corps and the various parishes, the Army Corps promised to provide just compensation to landowners⁵⁸—although not necessarily as much as National Food claimed. The point here, however, is that public necessity played no part in the court's analysis, despite the extensive hurricane damage and continuing risks from the damaged levees.

For purposes of this article, the more significant importance of public necessity is that it remains a background principle of state property law that can resonate through a regulatory takings analysis. Specifically, this resonance with the public necessity doctrine can effectively (if, legally, only very obliquely) strengthen the government's position in the *Penn Central* balancing analysis when the government's regulation responds to a public necessity-like awareness of significant threats to traditional public health and public safety concerns.

C. State Coastal Regulation and Regulatory Takings Challenges

Traditional public health rationales remain directly relevant to *Penn Central* regulatory takings analyses, and hence this article focuses on state coastal management measures that are subject to regulatory takings claims. *Lucas*'s treatment of South Carolina's Beachfront Management Act is one, albeit extreme, example.

One prior inquiry in this context is whether impacts on private property resulting from government coastal protection efforts

⁵⁵ LA. REV. STAT. ANN. §§ 29:721–738 (2006).

⁵⁶ Nat'l Food & Beverage Co. v. United States, 105 Fed. Cl. 679, 685–86 (2012).

⁵⁷ *Id.* at 704.

⁵⁸ *Id.* at 685.

sound as constitutional takings claims in the first place. For example, in the wake of Hurricane Katrina, a number of property owners in New Orleans brought constitutional takings claims against the United States based on the failure of the Army Corps's levees and the subsequent flooding and continuing risk of flooding to their properties.⁵⁹ However, the U.S. Court of Federal Claims concluded that the plaintiffs' allegations sounded in tort rather than in constitutional takings, because New Orleans's flood protection system did not itself cause the flooding—the hurricane did.⁶⁰ Under this analysis, somewhat perversely, injuries to private coastal properties caused by the failures of government projects designed to protect those properties are less likely to sound as constitutional takings claims than injuries to private properties caused by government projects designed to protect the coast more generally.⁶¹ In the context of coastal inundation, this dual classification of government action along the coast in effect privileges private property interests over more general regulatory perspectives focused on a broader public benefit, strongly suggesting that coastal governments will be (or should be) looking for mechanisms to add constitutional *gravitas* to the increasing public need for more stringent and creative coastal regulation.⁶²

Of course, as is true with regulatory takings claims in all contexts, most regulatory takings claims against coastal regulations fail, either because of ripeness concerns⁶³ or on the merits.⁶⁴ On

⁵⁹ *Nicholson v. United States*, 77 Fed. Cl. 605, 611 (2007).

⁶⁰ *Id.* at 617–19.

⁶¹ See, e.g., *Borough of Harvey Cedars v. Karan*, 70 A.3d 524, 526 (N.J. 2013) (conceding that just compensation was owed to coastal landowners when the Borough of Harvey Cedars exercised its power of eminent domain to build dunes along their beachfront property, even though “[t]he dunes serve as a barrier-wall, protecting the homes and businesses of Long Beach Island from the destructive fury of the ocean”).

⁶² Of course, private coastal properties also tend to benefit from regulatory measures designed to protect the public more generally, and courts are beginning to recognize that these benefits need to be taken into account in the analysis of just compensation. See, e.g., *id.* at 541–44 (requiring that the jury be allowed to hear evidence of how coastal dunes *benefitted* coastal property owners in storms such as Superstorm Sandy when determining the fair market value of the property).

⁶³ See, e.g., *Estate of Hage v. United States*, 687 F.3d 1281, 1287–88, 1292 (Fed. Cir. 2012); *People v. Novie*, 976 N.Y.S.2d 636, 643–44 (N.Y. App. Term 2013); *Bridgeview Vineyards, Inc. v. Or. State Land Bd.*, 309 P.3d 1103, 1114 (Or. Ct. App. 2013); *Hidalgo Cnty. v. Dyer*, 358 S.W.3d 698, 710, 711 (Tex. App. 2011); *Charles A. Pratt Constr. Co. v. Cal. Coastal Comm'n*, 76 Cal. Rptr. 3d 466, 475–77 (Cal. Ct. App. 2008) (all dismissing regulatory takings cases on

the merits, moreover, coastal regulatory takings claims can fail for a variety of reasons, including—as in Florida⁶⁵—the application of background principles of state property law.⁶⁶

More interesting, however, is the recent growing recognition among the courts in coastal states that coastal properties are inherently vulnerable and that this vulnerability has bearing both on the regulatory takings analysis and the compensation owed for any kind of governmental taking of coastal properties. For example, in *Gove v. Zoning Board of Appeals of Chatham*,⁶⁷ the Massachusetts Supreme Judicial Court found that, under the *Penn Central* analysis, no regulatory taking of coastal property had occurred when the Zoning Board of Appeals denied the property owner a building permit for an undeveloped parcel of land (“lot 93”) located in a state coastal conservancy district.⁶⁸ First, the court concluded, “the evidence clearly establishes a reasonable relationship between the prohibition against residential development on lot 93 and legitimate State interests”—namely, “potential danger to rescue workers” and the concern “that in an especially severe storm, the proposed house ‘could certainly be picked up off its foundation and floated’ away, potentially damaging neighboring homes.”⁶⁹ Second, under the *Penn Central* analysis, lot 93 retained a value of \$23,000 even with the building restriction. More importantly, coastal storms had flooded the lot a number of times in the past (in 1938, 1944, 1954, and 1991), with the result that “[l]ot 93 is a highly marginal parcel of land, exposed

ripeness grounds).

⁶⁴ See, e.g., U.S. Gypsum Co. v. Exec. Office of Envtl. Affairs, 867 N.E.2d 764, 776–78 (Mass. App. Ct. 2007) (denying a landowner’s taking claim in connection with a decision to continue to include certain private lands within a designated port area).

⁶⁵ See discussion of the U.S. Supreme Court’s decision regarding Florida’s background principles of state property law in *Stop the Beach Renourishment* decision, *supra* notes 39–44 and accompanying text.

⁶⁶ For cases in other states that have relied on background principles of state law to defeat a takings claim, see, e.g., *Avenal v. Louisiana*, 886 So. 2d 1085, 1098–1103 (La. 2004) (applying state public trust doctrine principles to help defeat a constitutional takings claim in relation to oyster leases that were affected by the state’s coastal restoration efforts); *Stevens v. City of Cannon Beach*, 854 P.2d 449, 454–57 (Or. 1993) (applying the state’s common law doctrine of custom to defeat a takings claim by a beachfront landowner who was denied a permit to build a seawall that would have restricted the public’s historical use of the dry-sand area of the beach).

⁶⁷ 831 N.E.2d 865 (Mass. 2005).

⁶⁸ *Id.* at 873–875.

⁶⁹ *Id.* at 871, n.13.

to the ravages of nature, that for good reason remained undeveloped for several decades even as more habitable properties in the vicinity were put to various productive uses. *Lot 93 is now even more vulnerable than ever to coastal flooding.*⁷⁰ Finally, with respect to “the character of the government action,” the Massachusetts Supreme Judicial Court emphasized that the building restriction “is the type of limited protection against harmful private land use that routinely has withstood allegations of regulatory takings,” particularly because the regulation was a reasonable means of mitigating potential harm.⁷¹ In other words, the denial of the building permit smacked strongly of traditional government efforts to prevent or reduce the occurrence of public nuisances—nuisances that can arise specifically because of the vulnerability of developments in the coastal zone to coastal storms and inundation.

The New Jersey Supreme Court revealed a similar sensitivity to the vulnerabilities of coastal properties in 2013 when it evaluated the compensation owed to coastal landowners for an easement that the Borough of Harvey Cedars took by eminent domain in order to construct coastal dunes that would serve to protect the coastline from storm surges and erosion.⁷² Specifically, the court overruled the trial court and the Appellate Division’s decision that the jury could not consider evidence of the dunes’ *benefits* to the property in calculating damages.⁷³ Instead, in this partial takings case, the New Jersey Supreme Court determined that the jury *had* to consider the potential benefits—in terms of direct impacts on fair-market value—to the oceanfront property. In particular, the court emphasized that the coastal owners disproportionately benefitted from the government’s action⁷⁴ and that “rational purchasers” of coastal properties would consider both the property’s vulnerability and protections like dunes when deciding whether to buy.⁷⁵ Inherent in the court’s decision,

⁷⁰ *Id.* at 868, 874 (emphasis added).

⁷¹ *Id.* at 875.

⁷² Borough of Harvey Cedars v. Karan, 70 A.3d 524, 526–27 (N.J. 2013).

⁷³ *Id.* at 527.

⁷⁴ *Id.* at 541 (“Yet, clearly the properties most vulnerable to dramatic ocean surges and larger storms are frontline properties, such as the Karans’. Therefore, the Karans benefitted to a greater degree than their westward neighbors.”).

⁷⁵ *Id.* (“A willing purchaser of beachfront property would obviously value the view and proximity to the ocean. But it is also likely that a rational purchaser would place a value on a protective barrier that shielded his property from partial or total destruction.”).

therefore, is an acknowledgement that both coastal governments *and* prospective property purchasers are now acutely aware that oceanfront properties are vulnerable to coastal inundation, an awareness that affects these properties' market values despite the general attractiveness of beachfront homes.⁷⁶

Thus, at least some courts appear to be starting to evolve the application of regulatory takings law to incorporate new understandings of coastal inundation and the vulnerability of coastal properties to it. Nevertheless, coastal states with strong coastal regulatory programs continue to have to defend a considerable number of takings challenges every year, at not insignificant expense,⁷⁷ depleting resources that might more productively be directed at coastal adaptation. More importantly, several of their more innovative attempts to deal with coastal inundation have been falling to regulatory takings challenges.

Most famously, perhaps, after Tropical Storm Frances hit the Texas coast in 1998 and more importantly after Hurricane Rita in 2005, the State of Texas asserted that the state owned a "rolling" easement that would allow the general public to use the dry sand beaches wherever they existed post-storm—including places where the high-tide line had avulsively jumped inland onto private property.⁷⁸ In 2012, the Texas Supreme Court denied the state and the public that attempted adaptation to severe coastal inundation, holding that:

⁷⁶ Other researchers have also emphasized the importance of coastal property owners' understanding of the risks of owning coastal property, especially in a climate change era, and have proposed different kinds of regulatory reforms as a result. See, e.g., ANNE SIDERS, COLUMBIA CTR. FOR CLIMATE CHANGE LAW, MANAGED COASTAL RETREAT: A LEGAL HANDBOOK ON SHIFTING DEVELOPMENT AWAY FROM VULNERABLE AREAS iii (Michael B. Gerrard ed., 2013), http://web.law.columbia.edu/sites/default/files/microsites/climate-change/files/Publications/Fellows/ManagedCoastalRetreat_FINAL_Oct%202030.pdf (recommending that "[s]ales of coastal property should include a disclosure requirement that informs prospective purchasers of the risks they face.").

⁷⁷ Calculations of the exact costs of takings litigation to state and local coastal governments are difficult to obtain. Nevertheless, in California, it has been noted that the costs of an eminent domain proceeding can often exceed the value of the underlying property. E.g., Brad Kuhn, *When Projected Eminent Domain Litigation Costs Exceed the Value of the Property Acquisition*, CALIFORNIA EMINENT DOMAIN REPORT, NOSSAMAN LLP (Oct. 29, 2013), <http://www.californiaeminentdomainreport.com/tags/litigation-expenses/> (discussing a recent example in California where costs of eminent domain litigation have exceeded the value of the underlying property).

⁷⁸ *Severance v. Patterson*, 370 S.W.3d 705, 712 (Tex. 2012).

Texas does not recognize a “rolling” easement. Easements for public use of private dry beach property change size and shape along with the gradual and imperceptible erosion or accretion in the coastal landscape. But, avulsive events such as storms and hurricanes that drastically alter pre-existing littoral boundaries do not have the effect of allowing a public use easement to migrate onto previously unencumbered property. This holding shall not be applied to use the avulsion doctrine to upset the long-standing boundary between public and private ownership at the mean high tide line. The division between public and private ownership remains at the mean high tide line in the wake of naturally occurring changes, and even when boundaries seem to change suddenly.⁷⁹

Thus, the State of Texas’s attempt to deal with shifting public needs and private realities in the aftermath of severe coastal inundation failed on takings grounds.

II. SEA LEVEL RISE AND COASTAL SUPERSTORMS AS INCREASING THREATS TO PUBLIC HEALTH

One can hear in the Massachusetts Supreme Judicial Court’s *Penn Central* evaluation in *Gove*, discussed above, a resonance with nuisance law: although the court does not make the equation, it clearly figures the coastal building prohibition as a reasonable attempt to prevent lot 93 from becoming a nuisance (source of harm) to neighboring properties. Such resonances between *Penn Central* regulatory takings analyses and background prohibitions on nuisance are fairly common in regulatory takings jurisprudence.⁸⁰

Nevertheless, into the future, having regulatory takings analyses resonate more forcefully with the traditional public health aspects of public necessity may better serve coastal governments in defending against regulatory takings claims. Coastal inundation will almost certainly require creative new regulatory strategies, including land use strategies, to facilitate effective adaptation, and these new strategies may not always resonate clearly with traditional nuisance prevention. For example, states that choose coastal retreat over seawall construction—almost certainly the

⁷⁹ *Id.* at 724–25 (footnotes omitted).

⁸⁰ See, e.g., *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1022 (1992) (discussing the “long line of this Court’s cases” upholding states’ police powers to enjoin a property owner “from activities akin to public nuisances” in the face of Due Process and Takings Clause challenges).

better long-term adaptation strategy from a global public perspective⁸¹—will nevertheless face considerable difficulty in explaining how allowing the shorter-term destruction of coastal properties prevents future nuisances. However, that strategy, especially when combined with other land use requirements, can readily be explained as a means of preventing any number of public health disasters that could come with increasing coastal inundation.

Sea level rise is one of the more widely acknowledged results of climate change.⁸² Indeed, as part of the Intergovernmental Panel on Climate Change's ("IPCC") 2014 Fifth Assessment Report, the Working Group on the physical science basis of climate change reported in 2013 "high confidence" that the rates of sea level rise increased in the late 19th and early 20th centuries compared to the prior two millennia.⁸³ Moreover, the Working Group concluded that it was "very likely" that mean rates of global average sea level rise had increased from a rate of 1.7 millimeters (mm) per year between 1901 and 2010 to a rate of 2.0 mm per year between 1971 and 2010 to a mean rate of 3.2 mm per year between 1993 and 2010.⁸⁴ In total, sea level has risen about 0.19 meters since 1901,⁸⁵ and the Working Group projects that:

Global mean sea level will continue to rise during the 21st century. Under all RCP scenarios, the rate of sea level rise will *very likely* exceed that observed during 1971 to 2010 due to increased ocean warming and increased loss of mass from glaciers and ice sheets.⁸⁶

Depending on the scenario used, moreover, the Working Group projects that, on global average, sea level will rise somewhere between 0.26 and 0.98 meters by 2100.⁸⁷ Importantly, however:

Sea level rise will not be uniform. By the end of the 21st

⁸¹ See, e.g., SIDERS, *supra* note 76, at iii–iv (advocating against sea walls as an adaptation strategy).

⁸² See discussion *supra* notes 1–7 and accompanying text.

⁸³ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, WORKING GROUP I, SUMMARY FOR POLICYMAKERS, CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF WORKING GROUP I TO THE FIFTH ASSESSMENT REPORT, 11 (2013), available at http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf [hereinafter 2013 IPCC PHYSICAL SCIENCE SUMMARY].

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ *Id.* at 25 (citation omitted).

⁸⁷ *Id.*

century, it is *very likely* that sea level will rise in more than about 95% of the ocean area. About 70% of the coastlines worldwide are projected to experience sea level change within 20% of the global mean sea level change.⁸⁸

At the same time, increases in atmospheric and ocean temperatures are changing, and will continue to change, weather patterns around the world. As a result, the Working Group projected an increase in the frequency and intensity of heavy precipitation events over most landmasses in the mid-latitude and wet tropical regions toward the end of the century, and an increase in cyclone (hurricane) activity in the North Atlantic Ocean and, especially toward the end of the century, the Western North Pacific Ocean.⁸⁹

The combination of sea level rise, rising numbers of increasingly severe coastal storms, and existing coastal infrastructure poses significant risks to public health. Indeed, sea level rise already threatens coastal communities' drinking water supplies through saltwater intrusion,⁹⁰ and storms exacerbate the saltwater contamination of coastal aquifers.⁹¹ Sea level rise (especially in combination with ocean warming) can also promote a number of human diseases, ranging from mosquito-borne diseases like malaria and dengue fever, to diseases like cholera that have a sea phase, to infection from marine organisms like *Vibrio vulnificus* and poisoning from toxic blooms of marine algae.⁹²

These are significant public health risks in and of themselves, well justifying increased management of the coastal zone in the name of protecting public health. However, sea level rise can also intensify the impact of coastal storms by increasing the flooding that occurs in connection with storm surge,⁹³ and the immediate public health impacts of catastrophic coastal storms are more likely to motivate public demand that governments "do something"

⁸⁸ *Id.* at 26.

⁸⁹ *Id.* at 7 table SPM.1.

⁹⁰ See Robin Kundis Craig, *A Public Health Perspective on Sea-Level Rise: Starting Points for Climate Change Adaptation*, 15 WIDENER L. REV. 521, 529 (2010), and sources cited therein (describing the risks of saltwater intrusion).

⁹¹ *NOAA's State of the Coast: Saltwater Intrusion Puts Drinking Water at Risk*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., http://stateofthecoast.noaa.gov/water_use/groundwater.html (last updated Mar. 1, 2013) ("Coastal aquifers are also vulnerable to saltwater flooding due to storm surge and sea level rise.").

⁹² See Craig, *supra* note 90, at 530–34, and sources cited therein (describing the connections between changes in the ocean and these diseases).

⁹³ James G. Titus, *Greenhouse Effect, Sea Level Rise and Land Use*, 7 LAND USE POL'Y 138, 142–43 (1990).

to address coastal inundation. Both Hurricane Katrina and Superstorm Sandy provide striking examples of these public health impacts.

As I have noted elsewhere, “[i]f Hurricane Katrina taught us anything, it’s that what matters isn’t just the volume and the force of the seawater itself, but also what the seawater brings with it.”⁹⁴ The waters inundating New Orleans during Hurricane Katrina became a toxic soup, having washed over and flooded “[s]everal chemical plants, petroleum refining facilities, and contaminated sites, including Superfund sites, were covered by floodwaters. In addition, hundreds of commercial establishments, such as service stations, pest control businesses, and dry cleaners, may have released potentially hazardous chemicals into the floodwaters.”⁹⁵ Water from the storm surge picked up toxins already contaminating the soil (like creosote and arsenic), oil and gasoline from flooded vehicles, and biological contaminants from animal feces and sewage, collectively posing significant health risks to both remaining residents and emergency workers.⁹⁶ As two Tulane University sociologists summarized in 2007:

We now know that at a minimum, the floodwaters contained a complex mixture of contaminants. Some areas of the city soaked for weeks in a bath of heavy metals such as arsenic, lead, mercury, and zinc along with *Escherichia coli* and fecal coliforms, overcoated by a thin layer of petroleum-based volatile organic compounds (VOC).⁹⁷

New Orleans narrowly avoided a waterborne disease disaster, and toxic contaminants exacerbated by the flooding continued to plague the city long after the floodwaters had receded.⁹⁸

Hurricane Katrina thus demonstrated that what lies in the path of a severe coastal storm can matter significantly to the immediate- and longer-term public health consequences of that storm. If anything, 2012’s Superstorm Sandy—“the largest storm ever

⁹⁴ Craig, *supra* note 90, at 536.

⁹⁵ Danny D. Reible et al., *Toxic and Contaminant Concerns Generated by Hurricane Katrina*, 36 THE BRIDGE, Spring 2006, at 5, available at <http://www.nae.edu/File.aspx?id=7393>.

⁹⁶ *Id.*

⁹⁷ Scott Frickel & M. Bess Vincent, *Hurricane Katrina, Contamination, and the Unintended Organization of Ignorance*, 29 TECH. IN SOC’Y 181, 182 (2007).

⁹⁸ Craig, *supra* note 90, at 537–38 (citing LESLIE FIELDS ET AL., NATURAL RESOURCES DEFENSE COUNCIL, ARSENIC-LACED SCHOOLS AND PLAYGROUNDS PUT NEW ORLEANS CHILDREN AT RISK 4–5, 10 fig. 1 (2007), available at <http://www.nrdc.org/health/effects/wake/wake.pdf>).

recorded in the Atlantic Ocean,” “reach[ing] more than 1,000 miles in diameter and affect[ing] states from Florida to Maine”⁹⁹—only underscored the connection between land use planning decisions regarding whether and how buildings and facilities are sited in a coastal inundation zone and the actual and potential public health consequences of coastal storms. Indeed, property damage is a prominent feature in most reports on the hurricane’s impact, some of which estimate that “caused potentially \$50 billion in property damage in the United States alone.”¹⁰⁰

In terms of inundation, “[t]he storm’s arrival coincided with a high tide to push onshore a destructive surge of water 12.5 feet high at its peak.”¹⁰¹ Health impacts from this flooding were both physical and mental and both acute and long-term. As recent retrospective analyses of Superstorm Sandy have summarized, “at least 117 people in six states died as a direct or indirect result of Superstorm Sandy,” with “[d]rowning [being] responsible for 40 fatalities (34 percent of all deaths). Other causes of death were trauma from being crushed, cut or struck (16 percent), and carbon-monoxide poisoning (7 percent).”¹⁰² The drownings generally resulted from people’s failure to comply with evacuation orders and are considered the most preventable of hurricane-related deaths.¹⁰³ Other health impacts resulted from people’s displacement from their homes, injuries, and untreated conditions (new and continuing); more specifically, the Centers for Disease Control reported that “of the people relocated to New Jersey shelters after the storm, more than 5,100 reported a health care visit—52 percent for an acute illness; 32 percent for follow-up care, such as blood-glucose checks or medication refills; 13 percent for a worsening chronic illness; and 3 percent for injuries.”¹⁰⁴ Impacts on victims’ mental health remain a

⁹⁹ John Manuel, *The Long Road to Recovery: Environmental Health Impacts of Hurricane Sandy*, 121 ENVTL. HEALTH PERSPECTIVES A152, A153 (2013) (citation omitted), available at <http://ehp.niehs.nih.gov/wp-content/uploads/121/5/ehp.121-a152.pdf>.

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² Rachael Rettner, *Hurricane Sandy’s Toll on Health*, LIVESCIENCE (Oct. 28, 2013, 4:57 PM), <http://www.livescience.com/40754-hurricane-sandy-health-impact.html>.

¹⁰³ *Id.*

¹⁰⁴ *Id.*

concern.¹⁰⁵

These individual health impacts were, of course, tragic. However, according to John Manuel, “the greatest public health threat was from the loss of power. Sandy knocked out electricity for more than 8.5 million people in 21 states,” resulting in loss of heat, life support, and evacuations from area hospitals.¹⁰⁶ The loss of power also trapped many New York City residents—including thousands of elderly residents—in high-rise apartment buildings for days and even weeks without electricity, light, functional plumbing, or medical attention.¹⁰⁷ Some of these residents went weeks without medication for chronic conditions such as diabetes and cancer, and some ended up literally living in their own feces.¹⁰⁸ The loss of electricity also induced people to fire up generators, which has been deemed the primary cause of the many instances of—including deaths from—carbon monoxide poisoning.¹⁰⁹

Both air quality and water quality also generated public health concerns in the wake of Superstorm Sandy. Air quality concerns arose because of increased particulate matter in the air from drying mud and demolished buildings.¹¹⁰ As for water, “[r]aw sewage spilled into homes in Baldwin and East Rockaway, New York, when a sewage plant flooded and could not handle the volume,” and the storm knocked out approximately eighty sewage treatment plants in New Jersey, with both environmental and public health consequences.¹¹¹ For example, the Passaic Valley Sewerage Commission spilled about “2.75 billion gallons of untreated waste” that “flowed from the plant into the nearby bay during the five days the plant was out of commission.”¹¹² As a result of such spills, “[s]hellfish waters were closed statewide. Boil-water advisories were issued for affected water supply systems.”¹¹³

Superstorm Sandy’s damage continues to create public health concerns. For example:

¹⁰⁵ See *id.* See also Manuel, *supra* note 99, at A159 (discussing mental health impacts from Superstorm Sandy).

¹⁰⁶ Manuel, *supra* note 99, at A154.

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ *Id.* at A155–56.

¹¹⁰ *Id.* at A156.

¹¹¹ *Id.* at A156–57.

¹¹² *Id.* at A157.

¹¹³ *Id.*

Of the long-term health threats posed by Sandy, the most significant is mold growth in homes that were not properly remediated after flooding. Indoor exposure to mold has been linked to upper respiratory tract symptoms, cough, and wheeze in otherwise healthy people, and with exacerbation of symptoms in people with asthma.¹¹⁴

Some of the longer-term public health losses resulting from Superstorm Sandy are equally real but harder to assess. For example, animals used in medical research drowned by the hundreds in the flooding, representing a significant loss of future health benefits.¹¹⁵

Together, Hurricane Katrina and Superstorm Sandy provide significant support for coastal retreat and climate change adaptation policies—but they do so as much on grounds of safeguarding public health as they do on grounds of prudent land use planning. Even where coastal retreat is not a serious regulatory option, pragmatically or politically, the aftermaths of these two storms suggest a number of lesser management measures that coastal states may want to implement to lessen the public health consequences of coastal inundation. Such measures might include, for example: (1) substantially strengthened building codes, especially for facilities handling toxic materials or biological wastes; (2) “lockdown” requirements for certain coastal facilities, including both obvious candidates like coastal nuclear power plants and less obvious candidates like coastal sewage treatment facilities and gasoline stations; (3) significant building height restrictions in the coastal zone and requirements for stairways that can be illuminated by daylight; (4) increased protections for coastal aquifers; (5) increased protections for natural coastal buffers like wetlands, marshes, and coral reefs; (6) increased requirements for strategically placed and safer operating emergency generators; (7) prioritized cleanup of coastal Superfund and other contaminated sites, combined with increased remediation and financial responsibility requirements for many continuing coastal businesses; and (8) opportunistic removal of certain kinds of land uses from the coastal zone as specific businesses and facilities (gas stations, hazardous waste treatment facilities, landfills, sewage treatment facilities, hospitals, dry cleaners, major manufacturing facilities, chemical plants, and so on) close of their

¹¹⁴ *Id.*

¹¹⁵ *Id.* at A154.

own accord, combined with more stringent zoning to restrict the introduction of new such facilities and businesses into the coastal zone.

All these proposed improvements in coastal management are, facially, land use planning requirements—but all of them, especially in the United States’ recent experience with coastal inundation, can also be completely justified as measures to protect the public health in the traditional sense—that is, as measures to prevent disease and toxic poisoning, to ensure the continuing availability of clean drinking water, and to prevent mass injury and death. Framing these new regulatory measures as public health measures that invoke coastal governments’ strongest police powers, moreover, would provide coastal states with increased insulation from regulatory taking claims.

III. THE PUBLIC HEALTH POLICE POWER COMPARED TO THE LAND USE POLICE POWER IN THE FACE OF CONSTITUTIONAL “TAKINGS” CHALLENGES

The police power refers to the sovereign’s authority to protect the health, safety, and welfare of the public. Importantly, this power allows the government to respond to threatened harms, rather than merely reacting to harms that have already occurred. At bottom, exercises of the police power privilege the rights and needs of the community over the rights and needs of individuals, including private property rights. At the extreme, moreover, exercises of the police power effectuate the community’s right of survival, a right recognized in law in the previously-discussed doctrine of public necessity,¹¹⁶ which justifies both intrusions into personal liberties such as quarantine and destruction of private property without just compensation, such as when a fire or flood rages through town.

The police power once was, but no longer is, a complete defense to constitutional takings claims. Indeed, by recognizing the

¹¹⁶ As I have recognized elsewhere, “[t]he doctrine of public necessity has long operated as a defense to takings claims because courts recognize that in times of true emergency or public necessity, private rights fall to public need. According to the U.S. Supreme Court itself, ‘the common law had long recognized that in times of imminent peril—such as when fire threatened a whole community—the sovereign could, with immunity, destroy the property of a few that the property of many and the lives of many more could be saved.’” Craig, *supra* note 37, at 419–20 (citing *Surocco v. Geary*, 3 Cal. 69, 73 (1853), and quoting *United States v. Caltex, Inc.*, 344 U.S. 149, 154 (1952)).

possibility of a regulatory taking, *Pennsylvania Coal* effectively eliminated the originally broad police power defense. Fittingly for the subject of coastal inundation, the U.S. Supreme Court made this point clear in *Lucas*, a takings case involving South Carolina's attempt to regulate and protect its coast. The *Lucas* Court established that the relevant focus of a federal constitutional "takings" claim is state property law, and the state's general police powers to protect public health, safety, and welfare were not sufficient to insulate South Carolina's coastal legislation from a finding that a regulatory taking had occurred.¹¹⁷ Notably, many states had clung to broad police power defenses to regulatory takings claims—indeed, in *Lucas* itself, South Carolina argued, and the South Carolina Supreme Court had found, that the state's Beach Management Act was a proper exercise of the state's police power, insulating the state from takings claims based on the Act's operation.¹¹⁸

The U.S. Supreme Court, however, found this blanket police power defense to regulatory takings too facile and too broad. While it acknowledged that "many of our prior opinions have suggested that 'harmful or noxious uses' of property may be proscribed by government regulation without the requirement of compensation[,]"¹¹⁹ it limited those opinions to merely affirming that regulation could result in a diminution in the value of private property without effecting an unconstitutional taking.¹²⁰ As a result, "that noxious-use logic cannot serve as a touchstone to distinguish regulatory 'takings'—which require compensation—from regulatory deprivations that do not require compensation."¹²¹

Blanket application of the *Lucas* rule would deny *all* police power defenses to coastal regulatory takings claims. However, as the Supreme Court has now made clear, *Lucas*-type *per se* takings of coastal properties are rare. The state's proper exercise of the police power remains relevant in the *Penn Central* three-part

¹¹⁷ *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1007–09, 1020–22 (1992).

¹¹⁸ *Id.* at 1020–22.

¹¹⁹ *Id.* at 1022.

¹²⁰ *Id.* at 1022–23 ("The 'harmful or noxious uses' principle was the Court's early attempt to describe in theoretical terms why government may, consistent with the Takings Clause, affect property values by regulation without incurring an obligation to compensate—a reality we nowadays acknowledge explicitly with respect to the full scope of the State's police power.").

¹²¹ *Id.* at 1026.

regulatory taking analysis,¹²² because “the property owner necessarily expects the uses of his property to be restricted, from time to time, by various measures newly enacted by the State in legitimate exercise of its police powers . . .”¹²³

Within the *Penn Central* incorporation of the police power, a traditional public health connection may become increasingly important as coastal states try to adapt to coastal inundation. Specifically, there will likely be a period of time (probably already begun) in which state and local regulations designed to adapt to increasing coastal inundation must deal with land uses that currently “only” *increase risks* of disease, toxicity, injury, or damage. The problem for regulators is that, left unregulated, these risks almost certainly *will* manifest, but only in some relatively distant future legally (such as by 2100) or in response to a particular kind of “superstorm,” like Superstorm Sandy, that is unlikely in any particular year but statistically probable in the long term.

In this period of increasing and increasingly recognizable risks, many land use practices will constitute “not-quite-nuisances” or “not-yet-nuisances” that, nevertheless, also can adequately be addressed for the future through forethought, advanced planning, and relatively immediate regulation that begins to reduce the risks that these land uses and practices increasingly pose. However, coastal regulatory programs designed to reduce risks from coastal land use practices are also with predictable certainty going to be subject to repeated regulatory takings challenges. What this article argues most strenuously is that during this interim period of risk (before the imminent threat of or actual coastal inundation), land use planning rationales for coastal regulation will pale beside public health rationales in terms of strength in both thwarting and defeating regulatory takings claims.

So let’s return to the *Penn Central* analysis. As noted, the *Penn Central* regulatory takings test balances three factors: (1) the impact of the regulation on the property’s value; (2) the extent to which the regulation interferes with the property owner’s reasonable investment-backed expectations; and (3) the character of the government action.¹²⁴ While the existence of a traditional

¹²² See *Penn Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 124 (1978).

¹²³ *Lucas*, 505 U.S. at 1027.

¹²⁴ See *Penn Central*, 438 U.S. at 124–25.

public health motive has little influence on a court's evaluation of Factor 1 (impact on property value), it can very considerably affect both the court's evaluation of and the weight it gives to Factors 2 and 3.

With regard to Factor 2, for example, a property owner's negative impact on public health directly affects the reasonableness of his or her investment-backed expectations. To put it bluntly, even when the property owner's uses of land do not (yet) amount to a public or private nuisance, few would grant private landowners a reasonable expectation of being able to significantly increase the risk of disease, poisoning, or catastrophic harm for the rest of the community. Nor would most of the relevant community, I suspect, concede that they should be legally mandated to pay the landowner to stop the risky land use.

With regard to Factor 3, the character of the government action, courts are far more solicitous of police power arguments based on the traditional kinds of public health protection than they are of states acting purely through their land use planning powers. In part, as already noted, public health-based regulation is more likely than land use regulation to resonate with public nuisance or public necessity concerns. In part, however, courts—including the U.S. Supreme Court—seem simply more willing to continue to allow states to regulate relatively freely when significant public health concerns of the traditional kind are present.

A snapshot of the historical evolution of both police power rationales—land use and public health—will help to make this point. As noted, the U.S. Supreme Court recognized the regulatory takings doctrine in 1922. Nevertheless, for some time after that recognition, its treatment of the states' land use police power remained highly deferential and explicitly recognized states' needs to adjust to new realities. Consider, for example, the Supreme Court's discussion of the police power in connection with new zoning laws in its seminal 1926 case of *Village of Euclid v. Ambler Realty Co.*¹²⁵ a 6–3 decision upholding local governments' zoning authority:

Building zone laws are of modern origin. They began in this country about 25 years ago False Regulations, the wisdom, necessity, and validity of which, as applied to existing conditions, are so apparent that they are now uniformly sustained, a century ago, or even half a century ago, probably

¹²⁵ Vill. of Euclid v. Ambler Realty Co., 272 U.S. 365, 395–397 (1926).

would have been rejected as arbitrary and oppressive. Such regulations are sustained, under the complex conditions of our day, for reasons analogous to those which justify traffic regulations, which, before the advent of automobiles and rapid transit street railways, would have been condemned as fatally arbitrary and unreasonable. And in this there is no inconsistency, for, while the meaning of constitutional guaranties never varies, the scope of their application must expand or contract to meet the new and different conditions which are constantly coming within the field of their operation. In a changing world it is impossible that it should be otherwise.¹²⁶

This view of the breadth of the land use police power, and recognition that state and local governments need flexibility to adjust to changing socio-ecological realities, stands in stark contrast to the *Lucas* Court's insistence almost seven decades later that exercises of the land use police power conform to background principles of state property law, at least when such exercises cause a complete devaluation of the private property at issue. According to the *Lucas* Court, *Pennsylvania Coal* "affirm[ed] . . . limits to the noncompensable exercise of the police power,"¹²⁷ and the land use police power has become significantly less flexible and less able to respond to new circumstances as a result.

In contrast, the U.S. Supreme Court and most other courts remain remarkably solicitous of states' and local governments' exercises of their public health-related police powers, although the contexts generally do not involve regulatory takings because governments rarely insist on traditional public health rationales in land use planning. For example, in the 1905 case of *Jacobson v. Massachusetts*,¹²⁸ the Massachusetts legislature enacted a statute that allowed local governments to require vaccination and re-vaccination, with an exception for children deemed medically unfit for vaccination.¹²⁹ The City of Cambridge, Massachusetts, required vaccination, and Jacobson was criminally punished for refusing to comply. He sued, alleging a violation of his Fourteenth Amendment rights, but the U.S. Supreme Court upheld the vaccination requirement on the basis of the state's police power. Specifically, the Court emphasized that the police power often

¹²⁶ *Id.* at 386–87 (emphasis added).

¹²⁷ *Lucas*, 505 U.S. at 1026.

¹²⁸ 197 U.S. 11 (1905).

¹²⁹ *Id.* at 12.

serves to balance public and private interests:

[T]he liberty secured by the Constitution of the United States to every person within its jurisdiction does not import an absolute right in each person to be, at all times and in all circumstances, wholly freed from restraint. There are manifold restraints to which every person is necessarily subject for the common good. On any other basis organized society could not exist with safety to its members. Society based on the rule that each one is a law unto himself would soon be confronted with disorder and anarchy.¹³⁰

Thus, the Court recognized that a well-ordered society occasionally requires that individual liberties yield in order to protect the greater public good. As such, the Court's 1905 vision of the public health police power was analogous to its 1926 vision of the land use planning police power: state and local governments need to be able to change the rules in order to adjust to modern realities, to promote and protect a well-ordered—safe and healthy—society.

In sharp contradistinction to the Supreme Court's evolving view of the land use planning police power, however, its view of the public health police power has remained remarkably consistent—even when governments use public health and safety rationales in ways that interfere with how property owners use their property. In its 2000 decision in *City of Erie v. Pap's A.M.*,¹³¹ for example, the Supreme Court reviewed the constitutionality of the City of Erie, Pennsylvania's ban on public nudity.¹³² The majority acknowledged the city's public health and safety rationale for the ordinance, emphasizing that "in trying to control the secondary effects of nude dancing, the ordinance seeks to deter crime and the other deleterious effects caused by the presence of such an establishment in the neighborhood."¹³³ Moreover, "Erie's efforts to protect public health and safety are clearly within the city's police powers....The asserted interests of regulating conduct through a public nudity ban and of combating the harmful secondary effects associated with nude dancing are undeniably important."¹³⁴ Finally, analogizing to administrative law, the Court deferred to the City's determination that a problem existed,

¹³⁰ *Id.* at 26.

¹³¹ 529 U.S. 277 (2000).

¹³² *Id.* at 282–83.

¹³³ *Id.* at 293.

¹³⁴ *Id.* at 296.

because “[t]he city council members, familiar with commercial downtown Erie, are the individuals who would likely have had firsthand knowledge of what took place at and around nude dancing establishments in Erie, and can make particularized, expert judgments about the resulting harmful secondary effects.”¹³⁵ Thus, the Court concluded, the city’s exercise of its police powers to protect health and safety could limit how Pap’s ran its erotic dancing club, requiring the dancers to wear at least pasties and G-strings.¹³⁶

Agriculture and livestock quarantine and destruction cases provide ample evidence that the relative strength of the public health police power carries over into regulatory takings cases. Indeed, measures to prevent disease or reduce the risk or extent of pest invasion have long and strongly been upheld in both federal and state courts, including against constitutional takings claims. In 1917, for example, the Louisiana Supreme Court denied the owner of an orange orchard a constitutional takings claim when the state ordered the destruction of canker-infested trees, concluding that “[t]he owners of the other groves are entitled to protection now before the destruction emanating from defendant’s place overtakes their groves.”¹³⁷ Almost ninety years later, the Washington Court of Appeals upheld the Washington Department of Agriculture against constitutional takings claims when, after five citrus longhorn beetles escaped from quarantine, the Department destroyed all trees in the vicinity that could serve as hosts to the pest.¹³⁸ The court invoked aspects of the public necessity doctrine, emphasizing that “[t]he destruction of the ornamental trees in this case is a consequence incidental to a valid regulatory measure, one taken for the purpose of defending against an impending public peril.”¹³⁹ However, the Washington Court of Appeals—helpfully for lawyers interested in promoting coastal climate change adaptation measures—also invoked more basic principles that private landowners exist within a community. Specifically, it emphasized that property law

recognizes the reciprocal obligations of property owners to each

¹³⁵ *Id.* at 297–98.

¹³⁶ *Id.* at 301–02.

¹³⁷ La. State Bd. of Agric. & Immigration v. Tanzmann, 73 So. 854, 857 (La. 1917).

¹³⁸ 14255 53rd Ave. S. v. Wash. State Dep’t of Agric., 86 P.3d 222, 223 (Wash. Ct. App. 2004).

¹³⁹ *Id.* at 227.

other and to the surrounding community. The power that the State has to prohibit such uses of property as may be injurious to the health, morals, or safety of the public is not, and cannot be, “burdened with the condition that the State must compensate such individual owners for pecuniary losses they may sustain, by reason of their not being permitted, by a noxious use of their property, to inflict injury upon the community.”¹⁴⁰

As such, the court underscored the true power of the traditional public health-based police power in takings litigation, which is to invoke with considerable legal strength the interests of the community as a whole—including the ability of those interests to override, without compensation, the more narrow, short-term, and limited interests of individual private property owners.

CONCLUSION

In 2014, the IPCC advocated an economics-minded, global community perspective on community adaptation to coastal inundation, concluding with high agreement that “[f]or the 21st century, the benefits of protecting against increased coastal flooding and land loss due to submergence and erosion at the global scale are larger than the social and economic costs of inaction . . .”¹⁴¹ Moreover, “protecting against flooding and erosion is considered economically rational for most developed coastlines in many countries under all socio-economic and sea level rise scenarios analyzed, including for the 21st century [global mean sea level] rise of above 1 m[eter] (*high agreement, low evidence*).”¹⁴²

While some courts in the United States are beginning to identify and value the benefits to both communities and individual property owners of innovative state and local management measures to adapt to coastal inundation, that perspective is, as yet, far from universal. Nevertheless, the U.S. Supreme Court’s jurisprudence has demonstrated that Court’s progressively diverging support for states’ and local governments’ land use-based and public health-based exercises of their traditional police powers, with measures focused on traditional public health

¹⁴⁰ *Id.* (quoting *Keystone Bituminous Coal Ass’n v. DeBenedictis*, 480 U.S. 470, 489 (1987) (quoting *Mugler v. Kansas*, 123 U.S. 623, 668–69 (1887))).

¹⁴¹ 2014 IPCC COASTAL SYSTEMS, *supra* note 4, at 3.

¹⁴² *Id.*

concerns being far more likely to garner the Court's endorsement. As a result, coastal states and local governments pursuing innovative measures for dealing with the twin threats of coastal inundation—sea level rise and coastal storms—should strive to frame their regulatory measures to the extent possible as measures to prevent or reduce the risk of disease, toxic exposure, or mass injury and death. The impacts and aftermaths of Hurricane Katrina and Superstorm Sandy provide ample justification for this framing, as do the more general health and disease risks that sea level rise poses. In addition, coastal governments should also frame their coastal management measures to the extent possible as measures to prevent and mitigate public and private nuisances and as public necessity measures to deal with impending emergencies.

Of course, unless a government can actually invoke public nuisance or public necessity, none of these framings will protect coastal governments from liability for takings deemed to be physical takings of private property. As a result, and especially in light of the U.S. Supreme Court's 2013 decision in *Koontz v. St. Johns River Water Management District*,¹⁴³ states and local governments should be wary of relying on extracted easements, border shifting, and increasing public access rights in the coastal zone unless the relevant state's public trust doctrine or law of accretions and avulsions clearly supports such measures.

Conversely, invocation of nuisance and public necessity could well protect coastal states and local governments from even *Lucas*-type regulatory takings. More commonly, the combined nuisance and public necessity resonances of, and public health justifications for, evolving coastal management measures should effectively insulate states and local governments from liability for regulatory takings under the *Penn Central* analysis. To best survive judicial scrutiny, however, coastal governments should provide substantial factual analyses linking their coastal management measures to recognized public health risks from coastal inundation.

¹⁴³ *Koontz v. St. Johns River Water Mgmt. Dist.* 133 S. Ct. 2586, 2595–96 (2013) (holding that the U.S. Supreme Court's line of "unconstitutional conditions cases," which held that permit conditions requiring applicants to turn over property could be unconstitutional takings, also extends to pre-permitting negotiations and conditions precedent to the approval of permits, thereby potentially increasing governments' takings liability for conditions like exacted easements imposed in the coastal permitting context).