

# Research Handbook on Climate Disaster Law

Barriers and Opportunities

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RESEARCH HANDBOOKS IN CLIMATE LAW

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## 18. Climate change and property law

*John D. Echeverria*

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This chapter focuses on how the serious, predictable effects of climate change due to increased levels of greenhouse gases in the atmosphere may generate change in U.S. property law. While this chapter is limited to U.S. law, the types of pressures for change in property law discussed below will likely prove universal. Thus, this chapter should help illuminate how property law in many parts of the world will probably evolve in response to climate change.

Property law defines citizens' legal relationships between each other and with their governments with respect to land and other material things. The stability of property law has long been regarded as one of its most important attributes. Predictable application of settled rules of property law is generally regarded as both fair to citizens and indispensable to a well-functioning market economy. At the same time, variability is a hallmark of U.S. property law. Thus, some property rules are designed to respond to changes in the physical environment. In addition, property rules have evolved throughout history and vary from one part of the country to another. But the new phenomenon of climate change promises to alter the traditional balance between stability and variability in property law. In the near term, climate change will have dramatic (and mostly negative) impacts on some property owners and their property interests that are literally unprecedented in U.S. history. In addition, and focusing on the particular concern of this chapter, climate change will create new pressures on established property rules and generate the need for new and modified property rules.

This chapter uses the term property in a broad sense. Thus, it includes not only interests in land, but also in other resources, such as water. Most of the law governing private interests in property is state law, which varies to some degree from state to state. At the same time, one-third of the nation's lands are public lands owned by the federal government, and the law governing federal public lands is mostly, but not entirely, federal law.<sup>1</sup> For our purposes, property law also includes the property-protective provisions of the Bill of Rights (most notably the Takings Clause),<sup>2</sup> which establish constitutional outer limits on how far representative government can go in restricting the use and development of private property.

This chapter addresses the topic of climate change and property law in the following steps. The first section provides an overview of the long-standing dialectic between stability and change in U.S. property law. The second section describes the likely effects of predicted climate change on property owners and their property holdings. The third

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<sup>1</sup> See JAMES RASBAND, JAMES SALZMAN, & MARK SQUILLACE, *NATURAL RESOURCES LAW AND POLICY* 146–84 (2nd ed. 2009).

<sup>2</sup> U.S. CONST. amend. V (“nor shall private property be taken for public use, without just compensation”).

section discusses the kinds of pressure for change in property law likely to be generated by climate change, focusing on water rights, coastal boundary law, and regulatory takings doctrine. The fourth section discusses the different potential modalities of legal change, distinguishing between the potential roles of the courts and the legislatures in developing an adaptive law of property in response to climate change.<sup>3</sup>

## STABILITY AND CHANGE IN PROPERTY LAW

Our society values stability in legal doctrine and predictability in the application of legal rules. Indeed, stability lies at the core of the rule of law. Stability protects citizens from potentially unfair surprises arising from changes in the law. It also helps ensure that similarly situated persons will be treated in the same way in their dealings with government and with their fellow citizens.

Property law has long placed a special premium on the stability of legal rules. As the authors of a leading property text put it, "Courts have long said that the duty to follow precedent carries special force where property interests are involved."<sup>4</sup> The special value placed on stability in property law reflects the significant reliance interests involved when citizens make expensive investments in land and other property. It also reflects the importance of well-defined property interests to the efficient functioning of a market economy. At the same time, property law is replete with examples of variability. One type of property-law variability involves legal rules prescribing how the scope and perhaps even the existence of a particular owner's property interest will change in response to changes in the physical environment. For example, under the traditional law governing coastal boundaries, gradual erosion of the shore results in landward migration of the boundary between publicly owned submerged lands and privately owned uplands; at the same time, gradual accretion of the shore results in seaward migration of the boundary between private and public ownerships.<sup>5</sup> In the latter case the owner's property holding is expanded in size, and in the former case the owner's holding may shrink in size or even disappear entirely. Avulsive events, which involve a sudden, dramatic change in the shoreline, are subject to a different rule: The coastal boundary remains at its location prior to the avulsive event.<sup>6</sup>

To cite another example, under the system of appropriative water rights dominant in the western United States, the ability of holders of so-called "junior" water rights to exploit a water resource is dependent on the physical availability of a sufficient supply of water to satisfy the demands of "senior" rights holders and then, only after the demands of the seniors have been met, to meet the needs of the juniors.<sup>7</sup> If at any particular point

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<sup>3</sup> For an excellent, extended discussion of many of the issues examined in this chapter, see Holly Doremus, *Climate Change and the Evolution of Property Law*, 1 U.C. IRVINE L. REV. 1091 (2011).

<sup>4</sup> THOMAS W. MERRILL & HENRY E. SMITH, *PROPERTY: PRINCIPLES AND POLICIES* 1206 (2nd ed. 2012).

<sup>5</sup> See BARTON THOMPSON, JOHN LESHY, & ROBERT ABRAMS, *LEGAL CONTROL OF WATER RESOURCES* 633-35 (5th ed. 2013).

<sup>6</sup> *Id.* at 635.

<sup>7</sup> *Id.* at 169-73.

in time there is an insufficient supply to meet the demands of all water rights holders, the demands of seniors may be fully satisfied while the juniors are denied delivery of any water. In other words, property rights in water effectively expand and shrink with the weather.

A different but closely related type of variability in property law involves an explicit recognition that the substantive content of legal doctrine can evolve over time in response to the emergence of new information and the rise of new social values. For example, the government's public trust interest in submerged lands, which originally protected public rights to navigation and access to fisheries, has been expanded in some jurisdictions through a process of judicial interpretation to protect recreational uses and ecological integrity.<sup>8</sup> The application of nuisance doctrine, which lies at the boundary of property and tort doctrine, also has evolved in response to changing social and economic conditions.<sup>9</sup>

Another type of variability involves different property rules adopted in different parts of the country in response to the varying physical conditions across the country. Again, water provides a useful example. In the 17th and 18th centuries, the colonists on the eastern seaboard applied traditional riparian doctrine inherited from Great Britain.<sup>10</sup> Riparian doctrine, which is based on the principle of shared use by all those along the border of a stream, including in periods of shortage, was well adapted to the relatively water-abundant climate in the eastern United States.<sup>11</sup> In the 19th century, western migrants brought riparian water law doctrine with them. But the common law courts in Colorado and other western states soon repudiated riparian doctrine in favor of a system of prior appropriation, which is based on the principle of "first in time, first in right" and rejects the notion that shortages should be shared by all water rights holders in the basin.<sup>12</sup> This dramatic difference in water doctrine between East and West is generally explained by the fact that all water rights holders can share and still survive so long as water is generally plentiful. But in arid regions a sharing approach would mean that no water user would receive sufficient water to survive.

U.S. history also reflects property-law variability over time. The Supreme Court's early landmark decision in *Johnson v. McIntosh* sanctioned and rationalized the wholesale transfer of sovereign ownership of the North American continent from Native American tribes to European states based on the theories of "discovery" and "conquest."<sup>13</sup> No less

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<sup>8</sup> See *Marks v. Whitney*, 6 Cal. 3d 251, 259 (1971) ("The public uses to which tidelands are subject are sufficiently flexible to encompass changing public needs"); *National Audubon Society v. Superior Court*, 33 Cal. 3d 419, 447 (1983) ("In exercising its sovereign power to allocate water resources in the public interest, the state is not confined by past allocation decisions which may be incorrect in light of current knowledge or inconsistent with current needs").

<sup>9</sup> See RESTATEMENT (SECOND) OF TORTS, § 827, comment ("The character of a particular locality is, of course, subject to change over a period of time and therefore the suitability of a particular use of land to the locality will also vary with the passage of time. A use of land ideally suited to the character of a particular locality at a particular time may be wholly unsuited to that locality twenty years later").

<sup>10</sup> See THOMPSON, LESHY, & ABRAMS, *supra* note 5 at 633-55.

<sup>11</sup> *Id.* at 28.

<sup>12</sup> *Id.* at 188-91. See also *Coffin v. Left Hand Ditch*, 6 Colo. 443 (1882) (repudiating riparianism and embracing prior appropriation doctrine).

<sup>13</sup> 21 U.S. 543 (1823).

dramatically, the nation's bloody Civil War resulted in the abolition of the institution of slavery, destroying Southerners' enormously valuable property interests in human chattels.<sup>14</sup> In the 19th century, many states adopted Married Women's Property Acts, overthrowing the common law doctrine of coverture and according wives equal rights with their husbands to the control of their separate real and personal property.<sup>15</sup>

Finally, property law is subject to change because it is contested terrain in the nation's ongoing ideological battles between advocates of a libertarian versus a communitarian vision of our society. In the Supreme Court, in particular, a relatively conservative majority has, over the last 30 years, reshaped regulatory takings doctrine to provide greater insulation of private property interests from changes in government regulations. This development has potentially important implications for society's capacity to adjust existing property rules in order to make society more resilient in the face of climate change impacts.

## THE EFFECTS OF CLIMATE CHANGE ON PROPERTY

Climate change will have important impacts on private property interests in land and other resources. The basic character of projected climate change impacts is familiar, even if the magnitude and time frame are uncertain. This is partly attributable to the uncertain will and capacity of the global community to minimize future damage by controlling greenhouse gas emissions. Without getting into details, some of the major projected impacts of climate change include increased ambient temperatures, sea level rise, more frequent and more destructive storm events, shifts in patterns of precipitation, modification of wildlife habitat, and acidification of the oceans.<sup>16</sup>

Starting at the most basic level, climate change could dramatically reduce the value of, if not completely destroy, some private property holdings. A major portion of the wealth in the United States is concentrated in real property investments, which are threatened to varying degrees by climate change.<sup>17</sup> According to one report, based on projections developed by Zillow, nearly 1,000,000 Florida properties worth more than \$400 billion are at risk of being submerged by rising seas.<sup>18</sup> Recently collected data suggest that across the country the market values of residential properties in flood-prone areas are depressed relative to the values in other, less-flood-prone areas, which is the outcome one would expect

<sup>14</sup> U.S. CONST. amend. XIII (abolishing slavery).

<sup>15</sup> See Patricia A. Cain, *Two Sisters vs. A Father and Two Sons: The Story of Sawada v. Endo*, in PROPERTY STORIES 99 (Gerald Korngold & Andrew P. Morriss eds., 2nd ed. 2009).

<sup>16</sup> See CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT. U.S. GLOBAL CHANGE RESEARCH PROGRAM (JERRY M. MELILLO, TERESE (T.C.) RICHMOND, AND GARY W. YOHE, EDs., 2014), available at <http://www.globalchange.gov/nca3-downloads-materials>.

<sup>17</sup> See Fred Foldvary, *American Wealth and Real Estate*, PROGRESS (June 12, 2016), <https://www.progress.org/articles/american-wealth-and-real-estate> (explaining why The Federal Reserve Board of Governors' 2016 report "Financial Accounts of the United States" reveals that the total value of U.S. real estate is about \$65 trillion, a substantial portion of U.S. net wealth of \$80 trillion).

<sup>18</sup> See Christopher Flavelle, *The Nightmare Scenario for Florida's Coastal Homeowners*, BLOOMBERG NEWS (Apr. 19, 2017), <https://www.bloomberg.com/news/features/2017-04-19/the-nightmare-scenario-for-florida-s-coastal-homeowners>.

if sellers and purchasers of real estate took climate change threats into account in their decision-making.<sup>19</sup> Changing patterns of temperature and precipitation will change the types of agricultural crops that can be grown in different parts of the country, including the methods and costs of production and management, all of which will likely adversely affect the market value of certain agricultural lands. It is also possible that, as rising seas and other climate impacts make some regions *less* desirable for investment, demand will shift to less vulnerable and therefore relatively *more* desirable areas, potentially increasing property values in certain areas.

Property regimes that are designed to adjust the scope of property interests in response to changing environmental conditions can be expected to operate faster and in more dramatic fashion in response to sea level rise. As discussed, under the traditional law governing coastal boundaries, gradual erosion results in landward migration of the boundary line between publicly owned submerged lands and privately owned uplands. Assuming this traditional legal doctrine continues to apply in the era of climate change (an important question addressed below), sea level rise due to climate change may greatly increase the amount of private lands likely to be converted to public ownership relative to what would occur in the absence of climate change. While there will certainly be climate change impacts, the law of coastal boundaries has long been adaptive and in that sense the doctrine is arguably prepared to cope with the new challenge of sea level rise.

Similarly, the western system of prior appropriation also can be viewed as an adaptive law that anticipates and in a sense is prepared to cope with the challenge of climate change. Under the prior appropriation system, junior water rights holders are, by legal definition, at risk of having to forgo water deliveries if there is only sufficient water supply to meet the demands of senior water rights holders. Climate change is expected to reduce annual precipitation levels and increase the risk of drought in much of the western United States, especially the nation's south-western quadrant.<sup>20</sup> Thus, with climate change, it is predictable that junior water rights holders who currently see their deliveries cut off from time to time will experience more frequent cut-offs of deliveries, and other, relatively less junior rights holders may experience curtailments in deliveries for the first time. Some very junior water rights holders may find their property interests in water converted into meaningless paper rights, because there may never be sufficient water for them after meeting the demands of more senior water rights holders. While these impacts will be new, they will flow from what can be characterized as the "normal" operation of existing property rules.

The next and arguably more interesting issue is whether climate change impacts will create pressure for change in the legal rules governing property ownership themselves, the question to which we now turn.

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<sup>19</sup> Ian Urbina, *Perils of Climate Change Could Swamp Coastal Real Estate*, N.Y. TIMES (Nov. 24, 2016), <https://www.nytimes.com/2016/11/24/science/global-warming-coastal-real-estate.html> ("Over the past five years, home sales in flood-prone areas grew about 25 percent less quickly than in counties that do not typically flood, according to county-by-county data from Attom Data Solutions, the parent company of RealtyTrac").

<sup>20</sup> See MELILLO, RICHMOND, & YOHE, EDS., *supra* note 16.

## POTENTIAL PROPERTY LAW RESPONSES TO CLIMATE CHANGE

As discussed above, U.S. property law has traditionally reflected a certain level of variability, over history and in different parts of the country, based on different climatic conditions. Accordingly, it only makes sense to consider whether impending climate change impacts will force or at least encourage further evolution in U.S. property law.

### I. Water Rights

Climate change is expected to create increased water scarcity in many parts of the country. Increased water scarcity will in turn generate more conflicts over water use. These conflicts may well put pressure on existing legal rules and institutional arrangements for managing water resources and prompt a re-examination of these rules and arrangements. Ultimately, climate change may lead to the development of new rules and institutions for managing water.

Climate change will produce more severe shortages of surface water supplies virtually everywhere in the country during at least some portion of the year. Measured on an annual average basis, future precipitation levels are predicted to vary considerably across the country, with significantly lower levels of precipitation in the south-western United States and higher levels of precipitation in the north-east, including New England.<sup>21</sup> Even in New England, however, where the total annual precipitation will increase, the frequency and severity of water shortages in the summer months are expected to increase.<sup>22</sup> Thus, virtually throughout the country, climate change will generate increased water conflicts in some parts of the year. These conflicts will involve competing demands by different citizens and firms for the opportunity to exploit water, as well as conflicts between private uses and environmental goals served by protecting natural water resources in place.

One potential upshot of increased water scarcity will be greater demand for more government regulation of water withdrawals. At common law, whether under the traditional riparian system or the prior appropriation system, property interests in water were self-initiated and conflicts between users were resolved after the fact through judicial proceedings.<sup>23</sup> Over the course of the 20th century, as populations grew and competition for water increased, many state legislatures, in both the East and the West, established regulatory programs to review proposed new water diversions before they occur.<sup>24</sup> But some states continue to exercise only light regulatory controls over water resources. For instance, in some eastern states there is no advance regulatory review of most new water diversions. It is foreseeable that states that have held out against exercising regulatory controls over water resources will institute comprehensive regulatory reviews in the face of increased water shortages induced by climate change.

Increased water shortages also may prompt more far-reaching modifications of existing

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<sup>21</sup> *Id.*

<sup>22</sup> *Id.*

<sup>23</sup> See THOMPSON, LESHY & ABRAMS, *supra* note 5 at 132, 181.

<sup>24</sup> *Id.* at 132, 224.



water law regimes. In the eastern United States, traditional riparian water law doctrine has already been replaced in some states by a system of so-called "regulated riparianism," under which rights of access to surface water are still basically governed by riparian doctrine but permission to divert water is subject to a regulatory review process to determine whether a proposed water use is in the public interest. In the face of increased water shortages, it is foreseeable that the premise that all riparian landowners have a right to use water may decline in importance and public interest review of water use may become more exacting. Likewise, in the West, while the prior appropriation system may well "function" in an era of increased water shortages, in the sense that the system will efficiently identify those water rights holders who must be cut off, it may be socially unacceptable to completely cut off large numbers of traditional water users. Climate change may create pressure to alter traditional appropriation doctrine to facilitate more equitable sharing of the burdens of water shortages.

One possible avenue for reform of prior appropriation doctrine is to expand public authority to curtail wasteful private uses of water, including by senior water rights holders. In the western United States, private water interests are qualified by various legal doctrines including the requirement that water be put to "reasonable and beneficial" use, the prohibition of "waste," and the notion that private rights in water are subject to an overarching public trust. Each of these doctrines has the potential to serve as a legal lever for forcing cutbacks in wasteful agricultural practices, for example, thereby leaving more water in rivers and streams to support fish and other wildlife or to free up water for use by junior rights holders who would otherwise be cut off. The courts have long recognized that proper application of these doctrines is not static but instead depends on contemporary facts and circumstances.<sup>25</sup> As climate change both increases demands for water and reduces available supplies, courts should be open to enforcing traditional limitations on private rights more aggressively in order to more equitably distribute the burdens of climate change.

An alternative approach to reform of water law in response to climate change would be to firm up the definition of private water rights in order to encourage more extensive water marketing. Under this approach, the key to dealing with water shortages will be to facilitate transfers of water from uses with lower economic value (such as agriculture) to uses with higher economic value (such as municipal drinking water). According to economic theory, the most socially advantageous trades can be identified by private buyers and sellers operating in an unregulated marketplace. To facilitate this process, the argument proceeds, rather than making private rights less robust (as implied, for example, by enforcing waste doctrine more rigorously) private rights should be made more certain. Possible objections to this approach include the existence of physical barriers to transferring water from one use to another (possibly distant) use, and the distributional implications of forsaking potentially robust public legal entitlements to regulate private water use.

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<sup>25</sup> *Id.* at 259–86 (discussing relevant precedents).

## II. Coastal Boundaries

Sea level rise due to climate change also may create pressure to modify the rules governing migration of coastal boundaries. The traditional doctrine has been justified based on various lines of reasoning, including the fairness of a legal regime in which coastal property owners are as likely to gain private land (due to accretion) as they are to lose private land (due to erosion), the importance of protecting coastal property owners' access to the water, and the administrative convenience of maintaining legal property lines coincident with the physical boundary between the ocean and the shore.<sup>26</sup> In the era of climate change, coastal boundaries will continue to migrate, but the change will be almost entirely in the form of coastal erosion rather than coastal accretion. The natural question is whether this change in the character of coastal boundary migration calls for a change in legal doctrine. Insofar as the current doctrine is based on the premise that property owners are equally likely to gain as to lose from changes in coastal boundaries, chronic, unilateral coastal erosion in the era of climate change arguably calls for consideration of jettisoning the old rule. As a result, courts could decide that, going forward, coastal boundaries should remain fixed and owners should be permitted to claim ownership of submerged lands out to the former mean high water line. On the other hand, the other traditional rationales for migrating boundaries still apply, suggesting that perhaps the law of coastal boundaries should remain unchanged. In sum, it is difficult to know how the law will evolve, but it seems certain that coastal boundaries will provide fodder for future litigation.

Another important new property question raised by sea level rise is how the courts should resolve the issue of ownership of lands behind coastal defense structures.<sup>27</sup> Specifically, if coastal property owners construct coastal defense structures and succeed in physically holding back the sea and defending their lands from erosion, who owns the lands behind the coastal defense structure that would have become submerged public lands in the absence of the defense structure? One potential answer is that the lands should be regarded as private because the owner has succeeded in preventing the advance of the sea. Another answer is that the lands that would have been submerged by rising seas, but remain dry because of the defense structure, should be regarded as public. In a significant decision, the U.S. Court of Appeals for the Ninth Circuit ruled that the legal boundary is the line that the sea would reach but for the coastal defense structure, reasoning that an owner of a coastal property "must accept that the property boundary is ambulatory" and that the public has "a vested right to gains from the ambulation of the boundary."<sup>28</sup> The *Milner* decision is likely not the last word on this topic, given that the case involved the special circumstance that the lands were held by the United States in trust for a Native American tribe. Furthermore, the Supreme Court declined a petition for *certiorari*. But, at some point, the issue will require a definitive answer.

Another potential effect of sea level rise on coastal boundary law involves the traditional rule

<sup>26</sup> See generally Katrina Wyman & Nicholas Williams, *Migrating Boundaries*, 65 FL. L. REV. 1957, 1971–80 (2013).

<sup>27</sup> See John D. Echeverria, *Managing Lands Behind Shore Protection Structures in the Era of Climate Change*, 28 J. LAND USE & ENVTL. L. 71 (2012).

<sup>28</sup> *United States v. Milner*, 583 F.3d 1174, 1186–87 (9th Cir. 2009), *cert. denied*, 130 S. Ct. 3273 (2010).

governing avulsion. As discussed, unlike either gradual erosion or accretion, which results in migration of the coastal boundary, avulsive changes in the shoreline do not result in a change in the location of the coastal boundary. While the distinctive treatment of avulsive events is supported by venerable precedent, some commentators have questioned the contemporary relevance of the special rule for avulsion and asked whether it should be abolished.<sup>29</sup> The advent of relatively rapid and unidirectional coastal erosion due to sea level rise associated with climate change appears to undermine the case for a special rule for avulsion.

### III. Takings Doctrine

As discussed in the introduction to this chapter, property law, viewed comprehensively, includes not only the state (and sometimes federal) law creating and defining private property interests, but also the constitutional provisions that limit the authority of government to regulate and otherwise constrain the use of private property. Principal among these is the Takings Clause of the Fifth Amendment to the U.S. Constitution, which provides: "nor shall private property be taken for public, without just compensation."<sup>30</sup> Similar provisions are included in state constitutions and they are generally (but not always) interpreted in the same fashion as the federal Takings Clause.

At its core, takings law involves the power of government to take property through eminent domain. The power of eminent domain is not expressly granted by the Constitution, but instead is assumed to exist as an essential attribute of sovereignty.<sup>31</sup> The function of the Takings Clause is to place conditions on the exercise of the eminent domain power, namely that it serve a "public use" (i.e., a public purpose), and be accompanied by payment of "just compensation." Since the founding of the nation, the eminent domain power has been used to seize land from holdout property owners standing in the way of efforts to secure rights of way for roads and railroads or sites for public buildings such as schools and post offices. The government is the moving party in eminent domain proceedings, whereas, as the name implies, affected property owners are the moving party in so-called inverse condemnation actions.

In contrast to the law of eminent domain, which is relatively stable, the scope and proper application of inverse condemnation takings doctrine are hotly contested issues. Moreover, over the last 30 years, the Supreme Court has issued a series of decisions articulating new takings tests and generally expanding inverse condemnation doctrine, making it a relatively dynamic area of the law.<sup>32</sup> In basic terms, successful takings claims depend initially on a claimant's ability to identify some protected "property" entitlement that will support the claim; one heavily litigated issue in takings cases is whether so-called "background principles" of state (or federal) law bar a claimant from asserting a property interest to begin with, thus defeating the takings claim at the threshold.<sup>33</sup> Assuming the

<sup>29</sup> See Joseph L. Sax, *Changing Currents: Perspectives on the State of Water Law and Policy in the 21st Century*, 23 TUL. ENVTL L. J. 305 (2010).

<sup>30</sup> U.S. CONST. amend. V.

<sup>31</sup> *Kohl v. United States*, 91 U.S. 367, 371–72 (1875).

<sup>32</sup> DANIEL SELMI, JAMES KUSHNER, EDWARD ZIEGLER, JOSEPH DiMENTO, & JOHN ECHEVERRIA, *LAND USE REGULATION*, 291–388 (5th ed. 2017).

<sup>33</sup> See *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1027–31 (1992).

claimant can point to some property affected by the government action, the next question is whether the action rises to the level of a taking. Generally speaking, inverse condemnation takings doctrine seeks to identify those regulations or other government actions that impose such a large economic burden that, in "all fairness and justice," the government should not be permitted to proceed unless it is willing to pay financial compensation.<sup>34</sup> While economic burdensomeness is the central inquiry, other relevant factors include the degree to which a regulation singles out a particular property owner (as opposed to applying to a significant portion of the entire community) and whether a regulation seeks to protect the community from serious risk of injury.<sup>35</sup>

Climate change will intersect with takings law in a variety of important ways. First, climate change may create a new demand for the use of eminent domain. Coastal inundation due to sea level rise is projected to force millions of residents of coastal communities to flee their homes and seek higher ground. To protect vulnerable citizens from risk of harm and to implement an orderly process of retreat, some local officials may turn to the eminent domain power to mandate full evacuation of certain areas. While essentially unprecedented,<sup>36</sup> this use of the eminent domain power will likely be met with the question whether forced evacuation serves a "public use," the answer to which almost certainly would be "yes" under current precedent.<sup>37</sup> Another issue likely to arise is what constitutes "just compensation" for the taking of properties threatened by rising seas for which there is no private market demand. If the remaining market value of vulnerable properties is largely based on the possibility of a voluntary government buyout, should that contribution to value be disregarded in computing constitutionally mandated just compensation? Even if only a modest amount of compensation is constitutionally mandated, does government have a moral obligation to compensate climate change victims at a higher level?

Climate change also will raise new questions about takings challenges to regulatory responses to sea level rise and coastal erosion due to climate change. One logical regulatory response to anticipated sea level rise will be to restrict new construction and rebuilding in vulnerable coastal areas. Another potential regulatory response will be to restrict building of coastal defense structures that may benefit individual owners for some period of time but harm other coastal property owners, restrict public access to the shore, and/or cause ecological injury. With respect to the first type of regulation, the leading precedent is the Supreme Court's decision in *Lucas v. South Carolina Coastal Council*, in which the Court ruled that a restriction on coastal development will generally result in a taking if it

<sup>34</sup> *Armstrong v. United States*, 364 U.S. 40 49 (1960).

<sup>35</sup> *Lingle v. Chevron U.S.A., Inc.*, 544 U.S. 528, 538 (2005) (citing *Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (1978)).

<sup>36</sup> One isolated example of the attempted use of eminent domain to relocate a community in the face of physical hazards involves moving the town of Centralia, Pennsylvania, to avoid the adverse effects of an underground coal fire. See MAXINE BURKETT, ROBERT R.M. VERCHICK, & DAVID FLORES, CENTER FOR PROGRESSIVE REFORM, REACHING HIGH GROUND: AVENUES TO SECURE AND MANAGE LAND FOR COMMUNITIES DISPLACED BY CLIMATE CHANGE 27 (2017), available at [http://progressivereform.org/articles/ReachingHigherGround\\_1703.pdf](http://progressivereform.org/articles/ReachingHigherGround_1703.pdf).

<sup>37</sup> See *Kelo v. City of New London*, 545 U.S. 469 (2005) (explaining that the Court's precedents, "without exception," have defined the term "public use" in the Takings Clause to mean "public purpose").

denies the owner "all economically viable use" of land.<sup>38</sup> The second type of regulation also may lead to the filing of a *Lucas*-type claim (for example, if a building lot is made unbuildable for lack of a sea wall), though a takings claim based on this type of regulation will more likely turn on the issue of causation (that is, was the lot destroyed by the sea or by the government denial of permission to build a sea wall?). In either event, the Takings Clause appears to stand as a potentially serious barrier to commonsense regulatory responses to the risk of sea level rise.

#### A. Regulatory takings analysis in the era of climate change

The question whether these kinds of regulatory responses to sea level rise can survive challenge under the Takings Clause will likely turn on the extent to which the courts factor into their analysis the reasonableness of an owner's "investment-backed expectations" in purchasing and developing a property. The increasingly alarming predictions of potential sea level rise, widespread media accounts of so-called "nuisance flooding" in coastal communities, and the imperative need to halt or at least constrain development in vulnerable areas, can all be viewed as putting purchasers of coastal properties on notice of potentially serious future regulatory constraints. Many states already impose significant restrictions on coastal development; it is logical to believe that projected sea level rise will lead to expansion of these restrictions. Moreover, the increasing vulnerability of coastal property to flooding and storm damage makes coastal real estate development an increasingly speculative investment, both in a financial sense and in a physical sense. Put simply, how can an investor claim a *reasonable* investment-backed expectation to develop a building lot when science suggests the lot will be regularly inundated by the sea in 30 years?

An important outstanding legal issue is whether the reasonableness of an owner's investment expectations is a relevant factor in a takings case governed by *Lucas*. The investment expectations idea was introduced into the Court's takings doctrine by the 1978 decision in *Penn Central Transp. Co. v. City of New York*. Under *Penn Central*, the question of takings liability turns on (1) the economic impact of the government action, (2) the degree of interference with investment-backed expectations, and (3) the character of the government action.<sup>39</sup> As generally understood, a takings claimant's investment expectations are shaped by, among other things, the rules and regulations in place at the time he purchased the property, the character of the regulatory environment and the likelihood that new restrictions might be enacted in the future, and the nature of the hazards to the public and neighboring property owners that might be created by the proposed use of the property.<sup>40</sup> Depending on the timing of the purchase of the property and other factors, the investment expectations factor could provide a powerful defense against a takings claim challenging coastal regulations adopted to address climate change impacts.

The specific legal question is whether a lack of investment expectations is a relevant factor not only in a case governed by *Penn Central*, but also in a case governed by *Lucas*, which rests on an allegation that the regulation has denied the owner all economically viable use of the

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<sup>38</sup> 505 U.S. at 1015.

<sup>39</sup> 438 U.S. at 124.

<sup>40</sup> *Appollo Fuels, Inc. v. United States*, 381 F.3d 1338 (Fed. Cir. 2004). 05 U.S. at 3, 1015. (1992).e).

property. The *Lucas* decision is sometimes read to establish a *per se* takings test, under which the dispositive inquiry for determining takings liability is simply whether the regulation in fact denies the owner all economically viable use of the property. Justice Scalia, author of the *Lucas* opinion, contrasted the test applied in *Lucas* with the multi-factor *Penn Central* framework for takings analysis, suggesting that some or all of the *Penn Central* factors should not be considered in a *Lucas* case. The primary exception to the *Lucas* rule of *per se* liability, Justice Scalia wrote, is that so-called "background principles" of property or nuisance law may preclude the claimant from asserting a property entitlement to begin with, defeating the takings claim at the threshold. Thus, on the surface, the *Lucas* opinion can be read to suggest that investment-backed expectations should play no role in a case governed by *Lucas*. This reading of *Lucas* implies that it may be difficult to defend new regulatory restrictions on coastal development in response to sea level rise against *Lucas* takings challenges.

But the issue of whether investment expectations should play a role in *Lucas*-type case is actually far from settled. *Lucas* does not contain a firm holding on the issue of whether a lack of reasonable investment-backed expectations may bar a *Lucas* claim. Mr. Lucas plainly had a strong argument that the South Carolina Coastal Act, adopted the year *after* he purchased the properties, frustrated his investment-backed expectations. A case involving a landowner who purchased land knowing of the restrictions already in place presents a different scenario that is not addressed by *Lucas*. Nor, implicitly, does *Lucas* address the viability of a *Lucas*-type claim if the claimant lacks reasonable investment-backed expectations for any other reason, including the inherent hazards associated with development in a particular location.

Equally important, Justice Anthony Kennedy, the current swing vote on takings cases on the modern Court, concurred only in the judgment in *Lucas* and explicitly adopted the position that investment expectations *should* be a relevant factor even if a regulation deprives the owner of all economically viable use. Drawing a sharp line between Justice Scalia and himself, he stated, "Where a taking is alleged from regulations which deprive the property of all value, the test must be whether the deprivation is contrary to reasonable, investment-backed expectations."<sup>41</sup> He continued:

[R]easonable expectations must be understood in light of the whole of our legal tradition. The common law of nuisance is too narrow a confine for the exercise of regulatory power in a complex and interdependent society. The State should not be prevented from enacting new regulatory initiatives in response to changing conditions, and courts must consider all reasonable expectations whatever their source. The Takings Clause does not require a static body of state property law; it protects private expectations to ensure private investment. I agree with the Court that nuisance prevention accords with the most common expectations of property owners who face regulation, but I do not believe this can be the sole source of state authority to impose severe restrictions. Coastal property may present such unique concerns for a fragile land system that the State can go further in regulating its development and use than the common law of nuisance might otherwise permit.<sup>42</sup>

The post-*Lucas* case law underscores rather than resolves the uncertainty created by Justice Kennedy's concurring opinion. The U.S. Court of Appeals for the Federal Circuit,

<sup>41</sup> 505 U.S. at 1034.

<sup>42</sup> *Id.* at 1035.

which has exclusive appellate jurisdiction over takings claims against the United States, is in a state of confusion on the issue. The court first squarely held that a claimant's investment expectations are a relevant factor in a *Lucas* case.<sup>43</sup> Another panel of the Court subsequently held that a claimant's investment expectations are irrelevant under the *Lucas* test.<sup>44</sup> As this chapter was going to press, the Supreme Court was weighing whether to grant a petition for *certiorari* filed by the United States asking the Court to resolve whether a lack of reasonable investment-backed expectations may defeat a *Lucas* takings claim.<sup>45</sup>

Resolution of the debate over the relevance of investment expectations in a *Lucas*-type case will no doubt turn in part on a careful parsing of the *Lucas* decision. But ultimately the answer may depend more on how the public, including members of the Supreme Court, perceive the crisis in coastal management created by projected sea level rise due to climate change. Especially if the more dramatic predictions of sea level rise turn out to be correct, the perceived social imperative of restricting development along the eroding shore without fear of takings liability may become overwhelming. Justice Kennedy, over 25 years ago, referred to "the unique concerns for a fragile land system" presented by coastal management. In light of what we have since learned about the threat of sea level rise, the concerns expressed by Justice Kennedy will only be more compelling the next time the Court re-examines *Lucas*.

## B. Background principles

Climate change impacts also are likely to put pressure on the definition of "background principles" of "property" or "nuisance" law as articulated in the *Lucas* decision. Justice Scalia, writing for the Court, stated that, even when a regulation denies an owner all economically viable uses of his land, a takings claim will fail "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."<sup>46</sup> In other words, if property or nuisance law already proscribes the claimant's proposed land use, the claimant cannot point to any protected "property," and the claim must be rejected without the need to even reach the question of whether a taking has occurred.

The Court has been less than clear about the source and scope of background principles. In *Lucas*, the Court rejected the coastal council's effort to defend its regulation against the takings claim by referring to the South Carolina legislature's findings about the harmfulness of coastal development, distinguishing background principles from "measures newly enacted by the State in legitimate exercise of its police powers."<sup>47</sup> The *Lucas* Court suggested that background principles are typically rooted in "common-law principles,"<sup>48</sup> by which the Court presumably meant common law precedent. But, in a subsequent case, the Supreme Court suggested that legislative enactments might sometimes qualify

<sup>43</sup> *Good v. United States*, 189 F.3d 1355, 1361 (Fed. Cir. 1999).

<sup>44</sup> *Palm Beach Isles Assocs. v. United States*, 231 F.3d 1354 (Fed. Cir. 2000).

<sup>45</sup> See *Lost Tree Vill. Corp. v. United States*, 707 F.3d 1286 (Fed. Cir. 2013), petition for cert. pending, No. 15-1192 (filed Mar. 22, 2016).

<sup>46</sup> *Id.* at 1027.

<sup>47</sup> *Id.*

<sup>48</sup> *Id.* at 1031.

as background principles, at least when they reflect "common, shared understandings of permissible limitations derived from a State's legal tradition."<sup>49</sup> The bottom line, under this viewpoint, is that legislation can potentially qualify as a background principle so long as it reflects a social consensus and has a fairly venerable pedigree.

On the other hand, the *Lucas* Court also suggested that background principles may be defined or redefined to reflect current circumstances. To explain how background principles of nuisance law would be applied in a takings case, the Court invoked sections 826 and 827 of the Restatement (Second) of Torts, which call for "analysis of, among other things, the degree of harm to public lands and resources, or adjacent private property" threatened by a proposed activity, along with "the social value of the activity", its "suitability to the locality in question," and "the relative ease with which the alleged harm can be avoided."<sup>50</sup> Most notably for present purposes, the Court stated that even though "[t]he fact that a particular use has long been engaged in by similarly situated owners ordinarily imports a lack of any common-law prohibition[,] . . . changed circumstances or new knowledge may make what was previously permissible no longer so."<sup>51</sup>

This last phrase suggests that the courts might appropriately modify the scope of nuisance doctrine for the purpose of takings analysis in response to new scientific understandings about the threat posed by climate change. Some types of coastal development have already been judged to be nuisances in the context of takings litigation.<sup>52</sup> But in the era of climate change more types of development might warrant the nuisance label, especially development along rapidly eroding shorelines that has limited private utility and threatens to harm private and public resources.

### C. The emergency exception

Finally, climate change impacts may create pressure for expansion of the so-called "emergency exception" to government takings liability. In *Lucas*, the Court explained that even if background principles of nuisance or property law do not apply, the government might "otherwise" be able to avoid takings liability. The Court continued, "[t]he principal 'otherwise' that we have in mind is litigation absolving the State (or private parties) of liability for the destruction of real and personal property, in cases of actual necessity, to prevent the spreading of a fire or to forestall other grave threats to the lives and property of others," citing *Bowditch v. Boston*<sup>53</sup> and *United States v. Pacific R., Co.*<sup>54</sup> In *Bowditch*, the Court held that the City of Boston could not be held liable for a taking when city officials demolished a building in a successful effort to arrest a major fire. Similarly, in *United States v. Pacific R. Co.*, the Court held that the government could not be held liable for the destruction of private property caused by military operations during the Civil War. While these venerable cases fit somewhat awkwardly with the rest of modern takings doctrine,

<sup>49</sup> *Palazzolo v. Rhode Island*, 533 U.S. 606, 630 (2001).

<sup>50</sup> 505 U.S. at 1030-31.

<sup>51</sup> *Id.* at 1031.

<sup>52</sup> See *Palazzolo v. State*, 2005 WL 1645974 (R.I. Super. July 5, 2005) (rejecting takings claim because, among other things, destruction of coastal wetlands would have constituted a taking).

<sup>53</sup> 101 U.S. 16 (1880).

<sup>54</sup> 120 U.S. 227 (1887).



they seem to rest on the principle that certain exigent government reactions to protect the public welfare are so important that they cannot properly be regarded as takings.<sup>55</sup>

As Professor Robin Craig has observed, climate change and its threatened coastal impacts can be analogized to the kinds of emergencies that have stood as a bar to takings liability in other contexts.<sup>56</sup> The potential usefulness of the emergency takings defense is limited by the traditional requirement of “an existing or imminent public necessity or emergency,”<sup>57</sup> as well as the general understanding that the defense only applies “if the destruction or limitation of private property is reasonably necessary to address the threat.”<sup>58</sup> While the second limitation is not a significant barrier to the invocation of the necessity defense in the climate change context, the requirement of “existing or imminent” peril might be. Perhaps the courts will be willing to overlook the generally gradual progress of climate change impacts in view of their catastrophic nature. As Professor Craig has put it, “[a]s sea-level rise becomes an increasingly pressing concern, . . . [state courts] could choose to evolve their common-law doctrines away from a strict emergency requirement, making them more supportive of longer-term governmental actions to address this problem.”

## THE LIKELY MODALITIES OF CHANGE IN PROPERTY LAW

A final topic worth considering is the relative roles of the judiciary and the other branches of government, and the relative roles of the federal government as opposed to the state governments, in doing the work of adapting the law of property to the new era of climate change. Resolution of the proper interpretation of the federal Constitution, including the Takings Clause, is obviously the province of the courts and ultimately the U.S. Supreme Court. But the relative roles of the different branches and levels of government in other realms are less clear.

The political branches have traditionally played an important role in shaping and reshaping property interests in response to new social needs and priorities. “Under our system of government,” the Supreme Court has said, “one of the State’s primary ways of preserving the public weal is restricting the uses individuals can make of their property.”<sup>59</sup> Thus, the state legislatures can take the lead in reshaping interests in scarce water resources by crafting new regulatory restrictions on the permitted uses of water. Assuming it is correct that the public has a legitimate claim to ownership of the potentially large land areas that would be submerged by rising seas but for the erection of coastal defense structures, the state legislatures have a potentially important role to play in crafting a

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<sup>55</sup> *United States v. Caltex, Inc.*, 344 U.S. 149, 152 (1952) (“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”).

<sup>56</sup> Robin Kundis Craig, *Public Trust and Public Necessity Defenses to Taking Liability for Sea-Level Rise Responses on the Gulf Coast*, 26 J. LAND USE & ENVTL LAW 395 (2011).

<sup>57</sup> *Id.* at 29.

<sup>58</sup> *Id.*

<sup>59</sup> *Keystone Bituminous Coal Ass’n v. DeBenedictis*, 480 U.S. 470 (1987).

management system governing the future private use of these public lands. As a final example, both the state legislatures and Congress have a responsibility to enact legislation creating comprehensive systems for managing organized retreat from communities being overtaken by rising seas.

In other realms, either the courts or the legislatures could take the lead. For example, the concept of "waste" in western water law was developed by the courts and has been applied and debated in numerous court cases. But there is no reason why the legislature could not step in and refine and update the concept of waste through legislation, in the same way that legislatures commonly define and redefine other common law rules through legislation. As Holly Doremus has observed, the key challenge for the courts in this process will be determining how to support and facilitate the needed changes in property law, rather than to stand in the way.<sup>60</sup>

## CONCLUSION

Climate change will have profound implications for the traditional U.S. law of property. Established property rules will to some degree accommodate and help manage the anticipated impacts of climate change. But climate change will create new problems and challenges that current property rules were not designed to address. Thus, climate change will not only change the physical world as we know it, but also the world of property law.

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<sup>60</sup> Doremus, *supra* note 3, at 112-23.