

# DUTY AND BREACH IN AN ERA OF UNCERTAINTY: LOCAL GOVERNMENT LIABILITY FOR FAILURE TO ADAPT TO CLIMATE CHANGE

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## INTRODUCTION

In *Litigating Climate Change Adaptation*,<sup>1</sup> I argued that despite a general skepticism about tort law's ability to tackle climate change there is an important role for this quite powerful branch of common law.<sup>2</sup> Claimants can seek compensation for harms incurred because of the negligent acts of local governments and developers vis-à-vis climate preparedness, or lack thereof.<sup>3</sup> The article argued that increased threat of liability as well as the possibility of growing success in the courts would galvanize more rigorous adaptation<sup>4</sup> and mitigation efforts at all scales.<sup>5</sup> Though an indirect benefit, adaptation litigation could be a purposeful use of tort's deterrence and behavior-changing potential.<sup>6</sup> That article did not, however, address the important and more challenging questions related to the nature and scope of the duty to which local governments would now have to adhere. Further, it did not tackle the possibility of more expansive duty obligations, which public policy may well demand in light of accelerated climate change. This Article attempts to do just that by exploring (1) reasonable conduct under climate-change circumstances and (2) the emergence of new obligations "to which the law will give recognition and effect."<sup>7</sup>

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<sup>1</sup> Maxine Burkett, *Litigating Climate Change Adaptation: Theory, Practice, and Corrective (Climate) Justice*, 42 ENVTL. L. REP. NEWS & ANALYSIS 11144 (2012).

<sup>2</sup> *Id.* at 11149.

<sup>3</sup> The negligence query would be as follows: "Has x defendant acted reasonably in light of the known risks of climate change when acting or failing to act, thus causing plaintiff's alleged harm?" *Id.*

<sup>4</sup> "Adaptation is the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities." Intergovernmental Panel on Climate Change, *Introduction to the Working Group II Fourth Assessment Report*, in CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY 6 (Martin Parry et al. eds., 2007), available at [http://www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_wg2\\_report\\_impacts\\_adaptation\\_and\\_vulnerability.htm](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm).

<sup>5</sup> Burkett, *supra* note 1, at 11146-47.

<sup>6</sup> *Id.* at 11147.

<sup>7</sup> W. PAGE KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS § 53, at 356 (5th ed. 1984).

With each year marked by relentless extremes—mild winters punctuated with wild blizzards followed by choking heat waves, late season wildfires, and devastating storms<sup>8</sup>—even the previously “climate indifferent”<sup>9</sup> will wonder why more reasonable action in response to the threat of climate change was not pursued actively by those who had the knowledge of its potential impacts and had the capacity to plan in light of them. Local governments and developers are two of the viable defendants as they determine much of what occurs at the coastline or in “red zones.”<sup>10</sup> Developers’ duty obligations and reasonable conduct are a bit more straightforward than those of local governments, and other scholars have explored them elsewhere, though under distinct but related circumstances.<sup>11</sup> Future claimants might, however, subject local governments to numerous claims regarding infrastructure and property impacts using a climate-change adaptation frame.<sup>12</sup> Inadequate adaptation planning and even poorly conceived adaptation policies might cause damage to property owners, thus exposing local governments to extensive liability. The claims for repair, reconstruction, and compensation by property owners subject to the negligent acts of others would not be “exotic” claims,<sup>13</sup> like those of the “carbon tort.”<sup>14</sup> The associated issues of duty and breach in claims against local governments, however, are more exotic.

The most difficult issues adaptation litigation raises are the antecedent ones: How do you define a duty with which potential defendants must comply and identify the actions that reasonable governments might take to discharge that duty? There are duties that are “easier” to define and meet. For example, if a local government builds infrastructure in the coastal zone it

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<sup>8</sup> Richard Somerville & Jeff Masters, *Summer of Extremes: Roundup of U.S. Records*, CLIMATE COMM. (Sept. 25, 2012), <http://climatecommunication.org/new/articles/summer-of-extremes/overview>.

<sup>9</sup> I use “climate indifferent” to describe those that are neither climate hawks nor climate deniers. They have not considered climate-change a pressing issue, regardless of their ideological bent. See Thomas Kaplan, *Most New Yorkers Think Climate Change Caused Hurricane, Poll Finds*, N.Y. TIMES (Dec. 3, 2012), <http://www.nytimes.com/2012/12/04/nyregion/most-new-yorkers-tie-hurricane-sandy-to-climate-change-poll-finds.html>.

<sup>10</sup> Red zones are areas where the “most unhealthy and flammable forests threaten dense developments or other resources.” Michael Kodas, *Life on the Edge (of Wildfire)*, ONEARTH MAGAZINE (Aug. 7, 2012), <http://www.onearth.org/print/22101>. Other viable defendants include real estate brokers, engineers, architects, and infrastructure owners, to name a few.

<sup>11</sup> See, e.g., Jeffrey Piampiano, Comment, *Coastal Erosion and the Risk of Liability for Coastal Land Developers*, 4 J. SMALL & EMERGING BUS. L. 347, 365 (2000).

<sup>12</sup> See Burkett, *supra* note 1, at 11148 (“[L]osses to the integrity of property or the physical body are the clearest case for duty of repair and corrective justice and are especially present in the climate adaptation context.”).

<sup>13</sup> See Douglas A. Kysar, *What Climate Change Can Do About Tort Law*, 41 ENVTL. L. 1, 4, 68 (2011) (stating that by forcing courts to confront questions of harm, causation, and responsibility that lie at the frontiers of science and ethics, climate change lawsuits hold the potential to move the bar for what counts as “exotic” in the domain of tort).

<sup>14</sup> See Burkett, *supra* note 1, at 11144.

must do so well enough to withstand reasonably anticipated risks. In the climate context, however, there are many “tougher” duty- and breach-related questions: What is a reasonable timeframe for which to plan? How do you frame the duty so that well-intentioned decision makers are not penalized if they make the wrong decision, even if based on best available science? When is coastal retreat the only right answer? This Article seeks to begin to answer these critically important questions.<sup>15</sup>

Part I of this Article briefly discusses the relevant developments in climate science, notably the increased willingness of scientists to attribute contemporary extreme events to climate change as well as the widespread underestimation of the severity of climate change. As in *Litigating Climate Change Adaptation*, this Article focuses on forecasts of sea-level rise (“SLR”) and its impacts to our coastlines.<sup>16</sup> Local governments wield significant influence on the development patterns and the resilience of the infrastructure within the coastal zone. Accordingly, Part I demonstrates why local governments’ duties are an appropriate focus of research and inquiry.

Part II explores what reasonable conduct under climate-change circumstances might look like for local governments. There are many elements of climate change that are quite unique to the phenomenon—namely, the degree of uncertainty that inheres, the myriad scales of governance and decision making implicated, and the lack of precedent or appropriate analogues that can guide sound action in response to climate impacts. Yet, some kind of principled and uniform approach is necessary. Therefore, Part II also considers the emerging best practices for adaptation and resilience that provide guidance for determining reasonable conduct, which is valuable for both the decision maker as well as the relevant arbiters in adaptation litigation.<sup>17</sup> This Part briefly tests these approaches against the easier, more difficult, and most challenging circumstances of climate-change adaptation.

Part III briefly considers the public policy arguments for introducing a legally cognizable duty where there has been none prior and removing immunity shields in instances where they clearly make communities more vulnerable. As the linkages between climate change and severe events become even more concrete, the expectation—and perhaps even duty—for

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<sup>15</sup> While there is literature that similarly anticipates increased adaptation-related litigation, there has not been a comprehensive exploration of the related duty and breach questions in a climate change context. For the former, see generally ROBERT MELTZ, CONG. RESEARCH SERV., R42613, CLIMATE CHANGE AND EXISTING LAW: A SURVEY OF LEGAL ISSUES PAST, PRESENT, AND FUTURE (2012) (“Sea level rise and extreme precipitation linked to climate change raise questions as to . . . design and operation of federal levees; and . . . government failure to take preventive measures against climate change harms.” (from the report’s unpaginated summary)); James Wilkins, *Is Sea Level Rise “Foreseeable”? Does It Matter?*, 26 J. LAND USE & ENVT. L. 437, 489-90 (2011).

<sup>16</sup> See Burkett, *supra* note 1, at 11152. The associated analysis would also be relevant to any community at the banks of a body of water.

<sup>17</sup> This, of course, is the judge, when making determinations regarding the presence of a cognizable duty, and the jury, at the breach determination stage.

local entities will be to take those impacts into account when making decisions affecting vulnerable areas. Further, if mistake, lack of competence, or willful ignorance on the part of local entities result in more devastating damage from climate change, it is manifestly unfair and dangerously costly to have those harmed bear the burden alone.

Ultimately, the aim of this Article is not to punish already burdened and, in many cases, resource-strapped local governments. Instead, it seeks to encourage local governments to prepare earnestly and aggressively for the inevitable and increasingly dangerous changes global warming presents. It is the most vulnerable—geographically *and* socioeconomically—who stand to suffer the most severe consequences of natural disasters and the anthropogenic inputs that both cause climate change and simultaneously increase our defenselessness in the face of it. By using established norms of duty and reasonable conduct, and leveraging the strength and success of property loss-related claims, litigation can galvanize local governments to do their best—*now*—for the benefit of all.

#### I. TORT LIABILITY AND CLIMATE-CHANGE ADAPTATION AT THE LOCAL LEVEL

Climate change-related litigation based on the tort of negligence will likely proliferate as the impacts of heat, storms, and fire further compromise infrastructure.<sup>18</sup> In the context of SLR and more destructive storm surge and flooding, viable claims by private property owners are numerous.<sup>19</sup> In fact, local jurisdictions in Australia, another common law country, have already seen climate-related claims based on decisions made with respect to the impact of development approval on third parties and construction of coastal protection works, among other claims.<sup>20</sup>

Adaptation to climate change at the local level is critically important because experiences of climate-induced weather events will vary at much smaller geographical scales. Further, the protection from personal and property losses has traditionally occurred most effectively at the local lev-

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<sup>18</sup> See generally MELTZ, *supra* note 15; BAKER & MCKENZIE, LOCAL COUNCIL RISK OF LIABILITY IN THE FACE OF CLIMATE CHANGE—RESOLVING UNCERTAINTIES 39 (2011), available at <http://www.climatechange.gov.au/~media/publications/local-govt/alga-report-final-pdf.pdf>.

<sup>19</sup> See, e.g., BAKER & MCKENZIE, *supra* note 18, at 25-26. Residents could sue a Council for negligently failing to consider SLR, flood, fire protection, or erosion control when granting development consent. *Id.* at 36.

<sup>20</sup> *Id.* at 3. Another Australian researcher concluded that, “local governments will only be at risk of civil liability—in nuisance or in negligence—for failing to take into account the impacts of climate change if their actions, or inactions, constitute a wholly unreasonable response to the risk of climate change.” Philippa England, *Heating up: Climate Change Law and the Evolving Responsibilities of Local Government*, 13 LOC. GOV’T L.J. 209, 218 (2008), available at [http://www98.griffith.edu.au/dspace/bitstream/handle/10072/26762/55160\\_1.pdf](http://www98.griffith.edu.au/dspace/bitstream/handle/10072/26762/55160_1.pdf).

el.<sup>21</sup> This Part briefly describes the current state of science on climate-induced events relevant at the coastline and then discusses the unique and critical relationship that local government—and local governance—has to these events. The purpose of the discussion is to demonstrate why it is critically important for the law to address the negligent acts of municipalities.<sup>22</sup>

#### A. *Relevant Climate and Sea-Level Rise Forecasts and Impacts*

Emerging climate science now suggests that we are exceeding the worst-case scenarios for the speed and severity of climate change.<sup>23</sup> This has important implications for local governments who must adapt to it. In 2012, more frequent and extreme weather events broke thousands of precipitation and temperature records and millions of acres burned, resulting in billions of dollars of damage.<sup>24</sup>

Climate scientists, who are not known for hyperbole, are now more willing to identify the signature of climate change in these recent weather trends and identify the need for actions to reduce the impacts of SLR, in particular.<sup>25</sup> Climate change's signature on SLR is well established through both modeling and observation.<sup>26</sup> Two recent studies underscore the vast

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<sup>21</sup> See *infra* notes 49-50 and accompanying text.

<sup>22</sup> I use local government and municipalities interchangeably throughout. Municipality describes a political subdivision, such as cities, towns, or districts, which permits or fosters growth or constructs infrastructure to manage sewage, drainage, or roadways, among other things. See, e.g., Steven Frederic Lachman, *Should Municipalities Be Liable for Development-Related Flooding?*, 41 NAT. RESOURCES J. 945, 947 (2001).

<sup>23</sup> See generally Bill McKibben, *Global Warming's Terrifying New Math*, ROLLING STONE, Aug. 2, 2012, at 52, 57 (describing Secretary of State Hillary Clinton's June 2012 "travel[] on a Norwegian research trawler to see firsthand the growing damage from climate change. 'Many of the predictions about warming in the Arctic are being surpassed by the actual data,' [Clinton] said, describing the sight as 'sobering.'").

<sup>24</sup> See generally Kostas, *supra* note 10; Somerville & Masters, *supra* note 8. This was true for 2011 as well. See Meg Crawford, *Business and Government Start Preparing for Climate Impacts*, CENTER FOR CLIMATE & ENERGY SOLUTIONS (Aug. 1, 2012), <http://www.c2es.org/blog/crawfordm/business-government-start-preparing-climate-impacts> (explaining that by the end of 2011, the United States had recorded more billion-dollar disasters than it did during all of the 1980s, totaling about \$55 billion in losses).

<sup>25</sup> In a recent study, researchers, including NASA climatologist James Hansen, explained, "[w]e can state, with a high degree of confidence, that extreme anomalies . . . were a consequence of global warming because their likelihood in the absence of global warming was exceedingly small." Monte Morin, *Some Climate Scientists, in a Shift, Link Weather to Global Warming*, L.A. TIMES (Oct. 12, 2012), <http://articles.latimes.com/2012/oct/12/science/la-sci-weather-climate-change-20121013> (second alteration in original); see also Kolja Rotzoll & Charles H. Fletcher, *Assessment of Groundwater Inundation as a Consequence of Sea-Level Rise*, NATURE CLIMATE CHANGE (Nov. 11, 2012) <http://www.nature.com/nclimate/journal/vaop/ncurrent/full/nclimate1725.html> ("Strong evidence on climate change underscores the need for actions to reduce the impacts of sea-level rise.").

<sup>26</sup> See, e.g., Rotzoll & Fletcher, *supra* note 25.

underestimation of SLR projections to date.<sup>27</sup> The first, based on observed SLR, concluded that the Intergovernmental Panel on Climate Change's estimations have lagged behind what is happening in the real world.<sup>28</sup> It is likely, therefore, that future projections are also inaccurate, portending much greater average global SLR by the end of the twenty-first century.<sup>29</sup> The second study looks at how much water stored in the Greenland and Antarctic ice sheets has been moving into the oceans.<sup>30</sup> If these ice sheets melt entirely, some end-of-the-century projections for SLR double to a total of two meters, or 6.6 feet.<sup>31</sup> Half of the world's population lives within 62 miles of the coast and, as of 2010, 52 percent of the U.S. population—or roughly 163 million people—lived in U.S. coastal watershed counties.<sup>32</sup> With elevated storm surges and increases in precipitation and heavy down-pour, climate-induced SLR threatens millions of people and places billions of dollars in property at risk.

Decision makers, resource managers, and local and regional planners will need to prepare with vigilance. To date, however, municipalities for the most part have not demonstrated the requisite vigilance.<sup>33</sup> This is dangerous

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<sup>27</sup> Anil Ananthaswamy, *Projections of Sea Level Rise Are Vast Underestimates*, NEW SCIENTIST (Nov. 29, 2012, 7:00 PM), <http://www.newscientist.com/article/dn22561-projections-of-sea-level-rise-are-vast-underestimates.html>.

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

<sup>29</sup> *Id.* Scientists also identify groundwater extraction for irrigation—a trend that will increase as climate change causes more droughts—as a net contributor to future SLR. *See id.*; Rotzoll & Fletcher, *supra* note 25 (“Besides marine inundation, it is largely unrecognized that low-lying coastal areas may also be vulnerable to groundwater inundation, which is localized coastal-plain flooding due to a rise of the groundwater table with sea level.”).

<sup>30</sup> Ananthaswamy, *supra* note 27.

<sup>31</sup> Anne C. Mulkern, *Scientists Search for Strategy to Convey Seriousness of Sea-Level Rise*, CLIMATEWIRE (Sept. 10, 2012), <http://www.eenews.net/public/climatewire/2012/09/10/1>; *see also* Michael D. Lemonick, *Sea Level Rise: It Could Be Worse than We Think*, CLIMATE PROGRESS, (July 21, 2012, 10:51 AM), <http://thinkprogress.org/climate/2012/07/21/516171/sea-level-rise-it-could-be-worse-than-we-think>.

<sup>32</sup> *The U.S. Population Living in Coastal Watershed Counties*, NAT'L OCEAN & ATMOSPHERIC AGENCY, <http://stateofthecoast.noaa.gov/population> (last visited Mar. 12, 2013). Coastal watershed counties encompass land areas where water flows into the ocean or Great Lakes. *Id.*

<sup>33</sup> *See, e.g.*, Mireya Navarro, *New York Is Lagging as Seas and Risks Rise, Critics Warn*, N.Y. TIMES, Sept. 11, 2012, at A1 (“While some new buildings are being elevated or going above current required flood protections—like a new recycling plant on a Brooklyn pier and the Port Authority’s transit hub at the World Trade Center site—most new construction is not being adapted to future flood risks yet, industry representatives said.”); *see generally* THE HEINZ CTR. ET AL., RESILIENT COASTS: A BLUEPRINT FOR ACTION 1 (2009) (explaining that, despite the cost savings from loss prevention and preparedness, coastal cities and towns lack adequate land-use requirements and building code standards to realize the savings), *available at* [http://www.heinzctr.org/Major\\_Reports\\_files/Resilient%20Coasts%20Blueprint%20for%20Action.pdf](http://www.heinzctr.org/Major_Reports_files/Resilient%20Coasts%20Blueprint%20for%20Action.pdf); Robin Kundis Craig, “Stationarity Is Dead”—Long Live Transformation: Five Principles for Climate Change Adaptation Law, 34 HARV. ENVTL. L. REV. 9, 21 (2010) (arguing that American law and policy is not keeping up with the need for adaptation and that the global legal response is insufficient to deal with the localized details of climate

in light of worst-case scenarios of climate change. It is also fiscally suboptimal, as studies confirm that a dollar in prevention can save exponentially more in cure.<sup>34</sup>

Superstorm Sandy provides a fitting allegory for the crossroads at which coastal communities now find themselves. The size and power of Sandy revealed the way in which poor land-use decisions can exacerbate already destructive coastal storms.<sup>35</sup> In an eerily prophetic statement made six weeks prior to the superstorm coming on shore, Columbia University's Earth Institute research scientist, Klaus H. Jacob, stated: "We've been extremely lucky . . . I'm disappointed that the political process hasn't recognized that we're playing Russian roulette."<sup>36</sup> Though not even at hurricane strength when it hit the northeast on October 29, Sandy represented a "tipping point" as an "unusual," "one in multi-century" weather event.<sup>37</sup> While it remains true that scientists cannot attribute a single storm to climate change, Cynthia Rosenzweig—a Columbia University professor, noted climate scientist, and cochairwoman of the New York Panel on Climate Change—identified compelling areas of linkage between Superstorm Sandy and climate change, including rising sea levels that made storm surges higher.<sup>38</sup> The planning, engineering, and design challenges that inhere should preoccupy local governments as they design and manage coastal communities for the future.

Indeed, most relevant to this Article, Sandy also underscores the need for local governments to appreciate fully the costs of, to date, low probab-

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change, requiring legal reforms at the national, state, and local levels). Of course, some municipalities have been very proactive. *See, e.g., State and Local Adaptation Plans*, GEORGETOWN CLIMATE CENTER, <http://www.georgetownclimate.org/adaptation/state-and-local-plans> (last visited Mar. 12, 2012).

<sup>34</sup> For savings in the flood hazard mitigation context, see Press Release, Ass'n of State Floodplain Managers, Floodplain Managers Urge Resilient Rebuilding from Sandy (Oct. 31, 2012) (explaining that "[f]ederal and industry studies have confirmed that for every dollar invested in flood hazard mitigation, approximately five dollars is saved in disaster payouts and economic disruption"), *available at* <http://www.nvoad.org/sandy-updates/219-floodplain-managers-urge-resilient-rebuilding-from-sandy>; *see also* THE HEINZ CTR. ET AL., *supra* note 33, at 1. Increased disasters have produced significant losses, economic and otherwise. Justin Gillis & Felicity Barringer, *As Coasts Rebuild and U.S. Pays, Repeatedly, the Critics Ask Why*, N.Y. TIMES, Nov. 19, 2012, at A1.

<sup>35</sup> *See generally* John Rudolf et al., *Hurricane Sandy Damage Amplified by Breakneck Development of Coast*, HUFFINGTON POST (Nov. 12, 2012, 12:15 PM), [http://www.huffingtonpost.com/2012/11/12/hurricane-sandy-damage\\_n\\_2114525.html](http://www.huffingtonpost.com/2012/11/12/hurricane-sandy-damage_n_2114525.html).

<sup>36</sup> Navarro, *supra* note 33, at A20.

<sup>37</sup> Colin Sullivan, *Columbia University Panel Urges Quick Action to Plan 'Coastal City for the Future'*, CLIMATEWIRE (Nov. 20, 2012), <http://www.eenews.net/climatewire/2012/11/20/archive/5?terms=colin+sullivan>. There were many "unusual or unprecedented" elements of Hurricane Sandy, including: "its gigantic scope, with tropical-force winds that spanned over 1,000 miles; [the presence of] the highest water levels ever at New York's Battery, a 32-foot wave in New York Harbor; and the simple fact that it veered west, to hit the New Jersey shore, which has never occurred in recorded history." *Id.*

<sup>38</sup> *Id.*

ity yet unprecedented and devastating events. Instead of rezoning at-risk areas to cease development, however, decision makers in New York and New Jersey allowed continued heavy development of risky coastal areas even though they were increasingly aware of the potential for “massive storm surge in the region.”<sup>39</sup> At least two fatalities in Staten Island occurred in developments completed as recently as the 1990s in coastal areas at extreme risk of storm surge flooding.<sup>40</sup> Regarding New Jersey, which suffered economic losses estimated at \$9 to \$15 billion, researchers at Princeton University in 2005 found that the rapid population growth in New Jersey’s “coastal counties was setting the scene for monumental environmental damage and property loss.”<sup>41</sup> Much of the hazards, according to the report, were man-made and predictable.<sup>42</sup> Episodic flooding events due to storm surges are, for example, failures in land-use planning and building code requirements.<sup>43</sup>

Sandy demonstrated that the local authorities’ failure to make decisions based on numerous long-predicted reports warning of the coastline’s inevitable vulnerability amplified the storm’s inherent destructive capacity.<sup>44</sup> What is worse is the prospect of repeated errors. Before declaring that there was “no question in my mind we’ll rebuild it,” New Jersey Governor Chris Christie described the post-Sandy damage to the state’s coastal communities as “unthinkable.”<sup>45</sup> It was, however, imagined repeatedly.<sup>46</sup>

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<sup>39</sup> See Rudolf et al., *supra* note 35 (citing numerous reports and studies over decades that highlighted the region’s increasing vulnerability).

<sup>40</sup> *Id.*

<sup>41</sup> *Id.*

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

<sup>43</sup> MATTHEW J.P. COOPER ET AL., FUTURE SEA LEVEL RISE AND THE NEW JERSEY COAST: ASSESSING POTENTIAL IMPACTS AND OPPORTUNITIES 24 (2005).

<sup>44</sup> See generally Rudolf et al., *supra* note 35 (providing a “Sounding the Alarm” timeline).

<sup>45</sup> *Id.*

<sup>46</sup> Master plans and reports predicted the growing dangers from continued development. See, e.g., CYNTHIA ROSENZWEIG ET AL., RESPONDING TO CLIMATE CHANGE IN NEW YORK STATE 39 (2011); Rae Zimmerman & Craig Faris, *Infrastructure Impacts and Adaptation Challenges*, in NEW YORK CITY PANEL ON CLIMATE CHANGE 2010 REPORT 63, 76 (2010); Alan I. Benimoff, Presentation at the Geological Society of America Northeastern Section (45th Annual) and Southeastern Section (59th Annual) Joint Meeting: A GIS Study of Urbanization in Hurricane SLOSH Zones on Staten Island, NY (Mar. 13-16, 2010) (summary available at [https://gsa.confex.com/gsa/2010NE/finalprogram/abstract\\_169194.htm](https://gsa.confex.com/gsa/2010NE/finalprogram/abstract_169194.htm)); see also STATE OF NEW JERSEY, 1 NEW JERSEY SHORE PROTECTION MASTER PLAN 54 (1981). As more of these kinds of reports surface, local governments might have more difficulty skirting liability.



B. *Foreseeable Impacts, Planning, and Local Government Domain*

One scholar has described municipalities as chartered creations of the state that “represent[] the common good.”<sup>47</sup> They are responsible for everything from land-use planning and development to infrastructure management to public health and emergency planning. Climate-induced weather extremes compromise each of these core responsibilities.<sup>48</sup> Further, local governments are already the most susceptible to natural hazard-based liability suits because “[i]t is at the local level that most of the active management of hazardous lands occurs (road building and maintenance; operation of public buildings such as schools, libraries, town halls, sewer and water plants; parks).”<sup>49</sup> Local governments have also approved most private subdivisions and permitted planned and existing buildings.<sup>50</sup> Despite access to better information and knowledge of the diverse costs of failing to adapt to climate change—from damaged infrastructure to lost productivity to loss of life<sup>51</sup>—local governments fail to represent the common good by failing to plan appropriately<sup>52</sup> or by dissenting from key substantive recommendations.<sup>53</sup>

Legal claims to encourage such action might proliferate and provide a stick to encourage appropriate calculation of the costs and benefits of adapting today. Similar climate litigation has already occurred in Australia,<sup>54</sup>

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<sup>47</sup> Lachman, *supra* note 22, at 949.

<sup>48</sup> See, e.g., Barry Chalofsky, Op-Ed, *As Storms Intensify, New Jersey Must Adapt*, THE TIMES OF TRENTON, Aug. 16, 2012, at A15; Eric Klinenberg, Op-Ed, *Is It Hot Enough for Ya?*, N.Y. TIMES, Aug. 5, 2012, at SR4. In the context of public utilities, see, e.g., Matthew L. Wald & John Schwartz, *Rise in Weather Extremes Threatens Infrastructure*, N.Y. TIMES, July 26, 2012, at A4.

<sup>49</sup> JON A. KUSLER & EDWARD A. THOMAS, NO ADVERSE IMPACT AND THE COURTS: PROTECTING THE PROPERTY RIGHTS OF ALL 15 (2007). The local level is also “where most public services with potential for creating liability, such as flood fighting, police, ice removal, emergency evacuation, and ambulance services, are provided.” *Id.*

<sup>50</sup> *Id.* at 18.

<sup>51</sup> Crawford, *supra* note 24. Coastal construction and reconstruction also introduces a somewhat hidden cost in the form of federally subsidized repair of storm-damaged infrastructure, see Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-207 (2006), and flood insurance, National Flood Insurance Program, 42 U.S.C. §§ 4001-129. See generally, Gillis & Barringer, *supra* note 34.

<sup>52</sup> See, e.g., Wade Rawlins, *North Carolina Lawmakers Reject Sea Level Rise Predictions*, REUTERS, July 3, 2012, available at <http://in.reuters.com/article/2012/07/03/environment-usa-northcarolina-idINL2E8I3DW320120703>.

<sup>53</sup> See, e.g., Rudolf et al., *supra* note 35 (describing the Bloomberg administration’s decision not to follow the New York State Sea Level Rise Task Force’s recommendations and citing “the ‘huge, huge dollar signs’ associated with the report’s recommendations and the ‘tension’ between the goals of development and environmental protection”).

<sup>54</sup> See generally BAKER & MCKENZIE, *supra* note 18; see also Hari M. Osofsky & Jacqueline Peel, *Litigation’s Regulatory Pathways and the Administrative State: Lessons from U.S. and Australian Climate Change Governance* 31 (2012) (unpublished manuscript) (on file with George Mason Law

with instances of successful resolution.<sup>55</sup> In those cases, the courts deemed a precautionary approach and proactive adaptation as appropriate, “notwithstanding the absence or evolving nature of state coastal planning policy frameworks.”<sup>56</sup> The subsequent local “government efforts to develop [climate-change] policy measures and decision-making guidelines for coastal climate change adaptation” and development approval hewed closely to the courts’ decisions.<sup>57</sup> Assuming that similar claims will land with greater frequency in American courts, with the knock-on effect of improved adaptation planning, to which standard of reasonable conduct will courts hold local governments in the U.S.? Will a precautionary approach, evidence of proactive adaptation, or cursory consideration of climate change in decision making suffice?

## II. DUTY

An intuitive sense that local governments should be obliged to protect property owners under the dangerous and unique circumstances of climate change does not alone justify the law recognizing and giving effect to that obligation. Indeed, without a clear sense of the nature of the duty owed, to whom it is owed, and what one can reasonably do to meet that duty, it is not clear that an arbiter will find a potential defendant liable for damages that ensue—even if one can justify liability on efficiency grounds or a more universal sense of fairness and morality.

The great complexities and unprecedented nature of climate change makes it difficult for municipalities to determine whether they are obliged to intervene in all components of adaptation-related decision making under their purview. Some actions may after all be more appropriate for private decision making. There are many instances in which the line between government obligation and private decision making is clear. To the extent that climate change manifests as an extreme amplification of familiar environmental stresses—like flooding—there is an existing body of state common law with copious (even if conflicting) holdings that tackle the main negligence elements, namely duty and breach. These are the easier cases explained below.<sup>58</sup> One can look to this deep body of case law, overlay likely climate-change scenarios, and come up with the best estimation of what constitutes nonnegligent action on the part of the local government. The

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Review) (arguing that adaptation litigation has served to advance Australian regulation and planning for future climate impacts far beyond the United States, among other developed countries).

<sup>55</sup> See *Taip v E. Gippsland Shire Council* [2010] VCAT 1222 (Austl.); *Gippsland Coastal Bd. v South Gippsland Shire Council (No.2)* [2008] VCAT 1545 (Austl.); see generally, BAKER & MCKENZIE, *supra* note 18; Osofsky & Peel, *supra* note 54, at 30-31.

<sup>56</sup> Osofsky & Peel, *supra* note 18, at 30-31.

<sup>57</sup> *Id.* at 31.

<sup>58</sup> For greater explication, see discussion *infra* Part II.B.

disposition of climate adaptation cases in which the appropriate timescale, for example, and other peculiarities of climate change are predominant — such as “preparing” for abrupt climate change or climate surprises—are harder cases. Finally, there are the “wicked”<sup>59</sup> cases. These are the instances in which an expansion of duty obligations is the only appropriate result but political complexities and poor precedent significantly retard appropriate and efficient action.

This Part takes the easier, harder, and “wicked” cases in turn in the following Sections and attempts to provide guidance on how local governments might anticipate potential adaptation-related liability and act reasonably under the circumstances.

#### A. “Reasonable Care Under the Circumstances”

In order to find a local government negligent for its actions in light of climate change, a plaintiff must establish that the local government’s conduct “falls below the standard established by law for the protection of others against unreasonable risk of harm.”<sup>60</sup> To prove negligence, a plaintiff property owner must satisfy four elements: duty, breach, causation, and damages. Duty and breach are most relevant here. Did the municipality owe a duty of care to these particular plaintiffs? If so, what was the nature of that duty and did the local government breach it?

##### 1. Establishing Duty and Reasonable Care

The general duty owed to others is to act reasonably toward those who are foreseeably at risk from a defendant’s behavior.<sup>61</sup> Foreseeability is not the sole determinate of viable plaintiffs.<sup>62</sup> Indeed, there are many foreseeable victims of climate change to whom a legally cognizable claim is currently unavailable.<sup>63</sup> Generally speaking, there is no duty to act affirmative-

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<sup>59</sup> See Richard Lazarus, *Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future*, 94 CORNELL L. REV. 1153, 1159 (2009) (“Scholars long ago characterized a public-policy problem with the kinds of features presented by climate change as a ‘wicked problem’ that defies resolution because of the enormous interdependencies, uncertainties, circularities, and conflicting stakeholders implicated by any effort to develop a solution.”).

<sup>60</sup> RESTATEMENT (SECOND) OF TORTS § 282 (1965).

<sup>61</sup> For a discussion of duty and breach in the context of claims brought against greenhouse gas emitters, see David Hunter & James Salzman, *Negligence in the Air: The Duty of Care in Climate Change Litigation*, 155 U. PA. L. REV. 1741, 1756-58 (2007).

<sup>62</sup> See *id.* at 1768-69.

<sup>63</sup> Courts generally do not hold the government liable when claims are based on negligence regarding nonstructural measures, even if the error is egregious or was easily preventable. See JON A. KUSLER, ASS’N OF STATE FLOODPLAIN MANAGERS FOUND., A COMPARATIVE LOOK AT PUBLIC

ly to aid another; however, while there is no affirmative duty to act to reduce naturally occurring flooding, for example, a municipality's ultimate decision to act triggers the duty to act reasonably.<sup>64</sup> Further, duty is "an expression of the sum total of those considerations of policy which lead the law to say that the particular plaintiff is entitled to protection."<sup>65</sup> In short, foreseeability coupled with other compelling policy concerns<sup>66</sup> will determine whether or not a legal obligation exists or emerges.

Flooding, for instance, is foreseeable.<sup>67</sup> Indeed, coastal hazards have become more "foreseeable" and predictable with improved technology and mapping.<sup>68</sup> This conclusion is consistent with the current duties the law imposes on local governments, such as the duty to ensure that municipal infrastructure is in good enough shape not to increase flooding to neighboring property during a reasonably anticipated storm event.<sup>69</sup> This may also justify a more expansive conception of appropriate operation and maintenance standards for municipal infrastructure as modeled under a downscaled climate scenario, for example.<sup>70</sup> Increasingly sophisticated data and "the rapidly accumulating body of evidence concerning climate" impacts may even make an unprecedented event foreseeable.<sup>71</sup>

To establish breach, therefore, the plaintiff property owner would need to show that a reasonable government "in the defendant's position would take certain reasonable precautions against a reasonably foreseeable risk of injury."<sup>72</sup> There are generally accepted approaches to determine reasonable conduct. The cost-benefit analysis of the Hand Formula captures the overall utility of the conduct: if the costs (B) of preventing the harm are less than

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LIABILITY FOR FLOOD HAZARD MITIGATION 10 (2009), available at [http://www.floods.org/PDF/Mitigation/ASFPMP\\_Comparative\\_look\\_at\\_pub\\_liability\\_for\\_flood\\_haz\\_mitigation\\_09.pdf](http://www.floods.org/PDF/Mitigation/ASFPMP_Comparative_look_at_pub_liability_for_flood_haz_mitigation_09.pdf); see also *infra* Part III.

<sup>64</sup> KUSLER, *supra* note 63, at 10; KUSLER & THOMAS, *supra* note 49, at 17 (citing *Indian Towing Co. v. United States*, 350 U.S. 61 (1955)) ("Courts have repeatedly held that once a governmental unit elects to undertake government activities, even where no affirmative duty exists for such action, it must exercise reasonable care."); Christopher City, Note, *Duty and Disaster: Holding Local Governments Liable for Permitting Uses in High-Hazard Areas*, 78 N.C. L. Rev. 1535, 1552 (2000) ("Under present law, a local government may be held liable for breaching a duty assumed when it takes actions that place third parties at risk of injury or otherwise induces reliance by third parties.").

<sup>65</sup> Hunter & Salzman, *supra* note 61, at 1748 n.32 (quoting *Brennen v. City of Eugene*, 591 P.2d 719, 722 (Or. 1979)).

<sup>66</sup> For a listing of factors courts have considered to determine duty of care, see *id.* at 1768-69.

<sup>67</sup> KUSLER & THOMAS, *supra* note 49, at 15.

<sup>68</sup> *Id.* at 13 ("With improved predictive capability and the actual mapping of areas, hazard events are now (to a greater or lesser extent) 'foreseeable' and failing to take such hazards into account may constitute negligence.").

<sup>69</sup> See *id.* at 12.

<sup>70</sup> See *infra* Part II.A.2.

<sup>71</sup> J. Cullen Howe, *Buildings*, in *THE LAW OF ADAPTATION TO CLIMATE CHANGE* 209, 227 (Michael B. Gerrard & Katrina Fischer Kuh eds., 2012).

<sup>72</sup> BAKER & MCKENZIE, *supra* note 18, at 28.

anticipated damages ( $P \times L$ ),<sup>73</sup> the conduct was unreasonable and a breach of duty.<sup>74</sup> A defendant is responsible for the harms of which they had actual or constructive knowledge<sup>75</sup> at the time their decision was made or their action taken.<sup>76</sup> For instance, if a local government did not know, but should have known, about the likelihood of increased storm surge due to climate-induced SLR, an arbiter might still find it in breach depending on the relative cost of protecting against the resulting flooding and other storm damage to property.

In sum, the factors considered when determining the reasonableness of government conduct might include the following: “whether government staff have knowledge of potential flood problems, the foreseeability of floods and resulting damage to individuals, the degree of risk involved, the norms of the profession, applicable regulations, and the amount of discretion involved.”<sup>77</sup> Indeed, courts have already often found local governments liable for damages when unreasonable government conduct causes flood erosion impacts.<sup>78</sup>

## 2. “. . . Under the Circumstances”

What reasonable conduct entails “under the circumstances” of a climate-change context will likely never be straightforward. Constantly shifting conditions are an inherent characteristic of climate change, and scientists also anticipate an accelerated rate of those shifts.<sup>79</sup> There is no static climate against which to plan.<sup>80</sup> Given the current state of the science, how-

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<sup>73</sup> In the Hand formula, P represents the likelihood of the harm occurring and L represents the severity of that harm. *United States v. Carroll Towing Co.*, 159 F.2d 169, 173 (2d Cir. 1947).

<sup>74</sup> *Id.*

<sup>75</sup> KUSLER & THOMAS, *supra* note 49, at 20; City, *supra* note 64, at 1552.

<sup>76</sup> BAKER & MCKENZIE, *supra* note 18, at 3. This means that courts or juries would not judge local governments’ decisions and actions by developments in climate science since the decision or action took place. *Id.*

<sup>77</sup> KUSLER, *supra* note 63, at 13. The “norms of the profession” may have limited effect due to the unique impacts climate change presents. See discussion *infra* Part II.A.2. It is true, however, that coastal communities may share similar impacts due to SLR. For a discussion of the role of discretion and immunity, see *infra* Part III.

<sup>78</sup> KUSLER, *supra* note 63, at 13. “This is true for both structural and nonstructural measures.” *Id.* (“There are many agreed upon and specific standards in the literature and in the engineering profession for design of dams, dikes, levees, stormwater systems and other structures. This facilitates proof of a ‘norm’ and ‘unreasonableness’ in design, construction, operation, or maintenance.”). There is, however, no bright line to “determin[e] the unreasonableness of government decisions pertaining to nonstructural measures.” *Id.* at 13–14. As a result, negligence claims pertaining to the latter are less successful. *Id.*

<sup>79</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 30–33 (2007) [hereinafter SYNTHESIS REPORT], available at [http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf); BAKER & MCKENZIE, *supra* note 18, at 17.

<sup>80</sup> SYNTHESIS REPORT, *supra* note 79, at 30–33.

ever, there are a few actions that one might now say are manifestly unreasonable. They include, but are not limited to, denying that climate change is occurring and ignoring evidence of its impacts that are established, credible, and have become widely available.<sup>81</sup> As climate change progresses, more actions will likely fall into the category of manifestly unreasonable conduct. However, there are currently far more ambiguities regarding climate change that will render a clear reasonableness determination elusive without further clarity and general guidance, which is discussed below.<sup>82</sup> This Section identifies a few of the main challenges of current and anticipated climate phenomenon.

The presence of climate change is indisputable.<sup>83</sup> Scientists have not resolved whether specific climate events are caused by climate change, however, and they likely will never be able to resolve this issue with complete certainty.<sup>84</sup> Of course, certainty is not required in tort cases, nor will the certainty of the connection be dispositive. In other words, local governments will need to act reasonably in light of the increased *risk* of extreme events caused by climate change, not the absolute certainty of their cause or occurrence.<sup>85</sup> That may be an easier evidentiary bar for a plaintiff, but it presents a unique quandary for municipalities seeking to avoid liability. As Professors David Hunter and James Salzman explain, “[g]iven the emerging understanding of climate change, determining what an appropriate response should have been at any specific time is difficult. It is, in fact, a subjective judgment about reasonableness—one that usually is left, in the tort context, to juries.”<sup>86</sup> Thus, the potential local government defendant as well as jurors will need some guidance on how to tackle this element of planning for “foreseeable” unknowns.

Climate-change adaptation is, accordingly, rife with uncertainty.<sup>87</sup> In addition to the pervasive uncertainty of climate modeling and projections,

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<sup>81</sup> BAKER & MCKENZIE, *supra* note 18, at 36. The report also adds “making decisions that increase vulnerability without regard to available precautionary methods” to the list of manifestly unreasonable actions. *Id.*; see also *infra* note 84 and accompanying text.

<sup>82</sup> See *infra* Part II.A.3.

<sup>83</sup> SYNTHESIS REPORT, *supra* note 79, at 26–41.

<sup>84</sup> See Burkett, *supra* note 1, at 11150.

<sup>85</sup> See *id.* The level of uncertainty that inheres can also lead to regulatory paralysis. See Jan McDonald, *Mapping the Legal Landscape of Climate Change Adaptation*, in ADAPTATION TO CLIMATE CHANGE: LAW AND POLICY 1, 27 (Tim Bonyhady et al. eds., 2010); see also SARA MOORE ET AL., DECISION-MAKING UNDER UNCERTAINTY: AN ASSESSMENT OF ADAPTATION STRATEGIES AND SCENARIO DEVELOPMENT FOR RESOURCE MANAGERS 45 (2012). Scenario planning provides a valuable tool. *Id.* at 2.

<sup>86</sup> Hunter & Salzman, *supra* note 61, at 1773. Some aspect of the inquiry may remain in the hands of the judge. *Id.* (“Although a judge might declare allegations of defendants’ conduct before 1990 to be non-negligent as a matter of law, after that point the determination would seem to be better left to juries.”).

<sup>87</sup> Uncertainty is distinct from risk. “Economists distinguish between ‘uncertainty’ (where the likelihood of the peril is nonquantifiable) and ‘risk’ (where the likelihood is quantifiable).” Daniel A.

when scientists attempt to “downscale” those projections—that is, provide climate forecasting for more narrow regional scales based on global climate trends—uncertainty with regard to future conditions increases.<sup>88</sup> Professor Jan McDonald argues, “uncertainty over the *direction* and not just the degree of change [at the regional and local scales] makes meaningful planning for anything other than ‘variability’ virtually impossible.”<sup>89</sup> There is also the phenomenon of the “fat tail” that is characteristic of climate change and suggests that catastrophic events will be more common.<sup>90</sup> Fat tails “describe systems that have a higher likelihood than the normal curve of extreme outcomes—in a graph, the tail of the distribution does not thin out as quickly as the normal distribution.”<sup>91</sup> In other words, extreme events are much more likely than is typical of the bell curve, which depicts a normal distribution.<sup>92</sup> The “obesity” of the fat tail, against which municipalities must plan, is uncertain.<sup>93</sup> Further, the way in which these changes will impact the environments with which they interact is unclear. The possibility of “threshold effects” or abrupt climate change exacerbates these impacts.<sup>94</sup>

All of this leads to uncertainty regarding the most desirable or practicable policy approach. McDonald explains that the “unprecedented complexity and the fact that other environmental and natural resource regimes have been ineffective in reversing resource degradation and ecosystem decline complicates the choice of policy instruments for adaptation.”<sup>95</sup> Of

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Farber, *Uncertainty*, 99 GEO. L.J. 901, 901 (2011). In addition, uncertainty is also not ignorance. *Id.* at 903 (noting that “[u]ncertainty is not the same as complete ignorance. Large bodies of data and theory bear on climate change”). Professor Dan Farber further explains that, “[u]ncertainty is particularly pernicious in situations in which catastrophic outcomes are possible, but conventional decision tools are not equipped to cope with these potentially disastrous results.” *Id.* at 901.

<sup>88</sup> See McDonald, *supra* note 85, at 27 (describing “four tiers of uncertainty that affect adaptive law making”). Professor Farber’s articulation of the “uncertainty” challenge of models and downscaling is helpful: “Climate models differ in terms of the severity of climate change that they predict for any given future emissions path, and the future emissions path depends on mitigation limits that are not yet known. Downscaling the models to predict local impacts introduces further uncertainties.” Farber, *supra* note 87, at 944 (footnote omitted).

<sup>89</sup> McDonald, *supra* note 85, at 28.

<sup>90</sup> Farber, *supra* note 87, at 923.

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

<sup>93</sup> *Id.* at 926-927 (quoting Martin L. Weitzman, *On Modeling and Interpreting the Economics of Catastrophic Climate Change*, 91 REV. ECON. & STAT. 1, 9 (2009)).

<sup>94</sup> McDonald, *supra* note 86, at 28 (citing James Hansen, *Tipping Point: Perspective of a Climatologist*, in 2008-2009 STATE OF THE WILD: A GLOBAL PORTRAIT OF WILDLIFE, WILDLANDS, AND OCEANS 6-15 (Eva Fearn ed., 2008); WILL STEFFEN ET AL., AUSTRALIA’S BIODIVERSITY AND CLIMATE CHANGE: TECHNICAL SYNTHESIS 42-46 (2009); Marten Scheffer et al., *Early-Warning Signals for Critical Transitions*, 461 NATURE 53, 53-59 (2009)).

<sup>95</sup> McDonald, *supra* note 86, at 28 (citing Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty Through a Learning Infrastructure*, 59 EMORY L.J. 1, 9 (2009)). These are formidable challenges for climate change adaptation, however, they should not prevent or delay adaptation action. Rasmus Heltberg et al., *Addressing Human Vulnerability to Climate Change:*

course, this does not counsel against action, nor has it hampered local level adaptation planning in many cases.<sup>96</sup> It does, however, require careful articulation of additional factors to employ to determine breach of a duty to exercise due care in a climate-impacted community.

The issue of geographical scale for purposes of determining what is appropriate at the community level creates another formidable obstacle as custom is not a reliable means of assessing due care.<sup>97</sup> Juries can look to custom or industry practice to provide persuasive, though not conclusive, evidence of best practices in a given arena.<sup>98</sup> Climate impacts are divergent and a community's exposure to it will depend on its population, topography, and a myriad of other unique and diverse characteristics. Climate-change adaptation is an "intensely local" endeavor,<sup>99</sup> and so useful comparisons will be few and far between. Moreover, as climate change, climatology, and relevant technologies evolve, so will expectations regarding municipalities,<sup>100</sup> though perhaps according to their resources and capacity.<sup>101</sup> All local governments will not have the ability to move as rapidly, and perhaps different adaptation milestones will be reasonable in some cases.

The relative capacities of local governments speak to policy concerns that might override a finding of negligence in some circumstances. In adaptation litigation, courts will have to weigh the injuries of property owners against the costs to local governments of imposing adaptation measures. Courts may reject liability out of concern that the scale of liability will have the capacity to "crush" defendant municipalities.<sup>102</sup> Tort liability might be so great that it exceeds the bounds of adjudication and is more appropriate for legislative resolution.<sup>103</sup> In these instances, arguably ones that climate change will introduce, courts may not impose a duty. While this Article

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*Toward a 'No Regrets' Approach*, 19 GLOBAL ENVTL. CHANGE 89, 94 (2009) ("Uncertainty extends into the policy arena: levels of funding, implementation arrangements, and effectiveness of proposed adaptation interventions are all uncertain and contested. Uncertainty, however, should not delay action.").

<sup>96</sup> See Burkett, *supra* note 1, at 11152 (citing Quirin Schiermeier, *The Real Holes in Climate Science*, 463 NATURE 284, 285 (2010)).

<sup>97</sup> See Hunter & Salzman, *supra* note 61, at 1777.

<sup>98</sup> See generally *id.* at 1776-78.

<sup>99</sup> Craig, *supra* note 33, at 29; see also Hunter & Salzman, *supra* note 61, at 1777-78.

<sup>100</sup> Hunter & Salzman, *supra* note 61, at 1778 ("[I]deas of the court, expressed 40 years ago . . . [are not] necessarily authoritative on the engineering and financial phases of the same problem today." (second and third alterations in original) (quoting *Bartlett v. N. Pac. Ry.*, 447 P.2d 735, 737 (Wash. 1968))).

<sup>101</sup> See Scott Malone, *Some Cities Find Small Steps Key to Storm Protection*, REUTERS (Nov. 20, 2012), <http://www.reuters.com/article/2012/11/20/us-storm-sandy-adaptation-idUSBRE8AJ08J20121120> ("Planners said they had few resources available to help their cities adapt to a changing climate—not just the threat of more storms—with a large number listing securing funds as a major challenge to their ability to plan.").

<sup>102</sup> Hunter & Salzman, *supra* note 61, at 1781-82.

<sup>103</sup> *Id.*



addresses and defends an expanded imposition of duty on other policy grounds, the line that determines what might constitute crushing liability is elusive. This is especially true if one considers the equal if not greater “crush” of cleaning up after large storms.<sup>104</sup>

All of these uncertainties do not argue in favor of inaction or reduced exposure to liability. They do demand a cataloguing of best practices and other methodology that will facilitate reasonable responses to climate impacts. Departures from these (largely) process-oriented recommendations will provide a universe of possible actions against which an arbiter can judge reasonable conduct.

### 3. Emerging Methods, Standards, and Best Practices

While there are specific actions that can avoid manifestly unreasonable conduct, there are emerging methods to ensure that local government decision making will tend to produce effective adaptation planning, even in the presence of uncertainty and variability. It seems clear that local governments should, at base, remain informed of current climate science and avail themselves of opportunities to keep staff educated about climate impacts and the scope of potential risks that local governments should consider.<sup>105</sup> Local governments should generally rely on the “best available science” at the time of decision making, particularly when considering adaptation measures.<sup>106</sup> In fact, local governments might “exceed the vagaries of the common law standard of . . . ‘reasonable and relevant’” by including an explicit reference to climate change in planning schemes.<sup>107</sup> Yet, as Australian legal scholar Phillippa England asked in 2008, “[h]ow can local governments avoid taking action that is ‘manifestly unreasonable’ in an area characterised by uncertainty, long term impacts and rapidly accruing information?”<sup>108</sup> The best practice, she argues, “is for councils to integrate climate change considerations into their existing risk management strategies.”<sup>109</sup> Numerous studies identify “the substantive and procedural fea-

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<sup>104</sup> See, e.g., Jonathan Tamari, *Obama: \$60B for Sandy Cleanup*, THE PHILADELPHIA INQUIRER, Dec. 8, 2012, at A1.

<sup>105</sup> BAKER & MCKENZIE, *supra* note 18, at 10. A centralized advisory body or agency may serve this purpose by collecting and disseminating information and providing assistance and input to aid local governments in risk assessment and adaptation decision making. *Id.* at 15. See generally Andrew Macintosh, *A Theoretical Framework for Adaptation Policy*, in ADAPTATION TO CLIMATE CHANGE LAW AND POLICY, *supra* note 85, at 38.

<sup>106</sup> Robert R.M. Verchick & Joel D. Scheraga, *Protecting the Coast*, in THE LAW OF ADAPTATION TO CLIMATE CHANGE, *supra* note 71, at 235, 238; McDonald, *supra* note 85, at 29.

<sup>107</sup> England, *supra* note 20, at 221. It is still not clear, however, whether anything more than a cursory mention of climate is necessary.

<sup>108</sup> *Id.* at 220.

<sup>109</sup> *Id.*

tures” that one might consider when assessing the reasonableness of local government decision making.<sup>110</sup> They include: “adequately resourced [measures], preferably with clear incentives for implementation[;] . . . incorporation or mainstreaming of adaptation measures[;] . . . stakeholder engagement in the entire adaptation process—from identification of risks or vulnerabilities to the generation and testing of adaptation options; . . . [and] evaluation of effectiveness and monitoring for continuous improvement.”<sup>111</sup>

Emerging principles for adaptive management and models of scenario-based planning and risk assessment provide blueprints for this kind of effective climate-change integration. Several scholars and researchers have written on the value and structure of adaptive management.<sup>112</sup> Its core principles “allow for staged transitions to higher levels of intervention when specified thresholds are reached and can drive ongoing improvement through built-in monitoring and evaluation processes.”<sup>113</sup> Adaptive management includes six basic steps: (1) assess the problem; (2) design an intervention; (3) implement it; (4) monitor it; (5) evaluate it; and (6) adjust the intervention on that basis.<sup>114</sup> The local government would then return to assessing climate-change-impacted decision making once again. In fact, because climate impacts will occur over long time scales and constantly shift in pace and geographic scope, “governments cannot and should not develop complete adaptation strategies” in the near term.<sup>115</sup> Sequenced responses<sup>116</sup> with ample opportunity to learn from experience may be more likely to produce reasonable conduct over the longer term.<sup>117</sup>

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<sup>110</sup> McDonald, *supra* note 85, at 12.

<sup>111</sup> *Id.* (footnotes omitted) (citing ADAPTATION AND MITIGATION STRATEGIES: FINAL REPORT 21 (Mike Hulme et al. eds., 2009); G.M. McKeon et al., *Climate Change: Adapting Tropical and Subtropical Grasslands*, in GRASSLANDS FOR OUR WORLD 426, 432 (M.J. Baker ed., 1993); Erika Spanger-Siegfried & Bill Dougherty et al., *User's Guidebook*, in ADAPTATION POLICY FRAMEWORKS FOR CLIMATE CHANGE: DEVELOPING STRATEGIES, POLICES AND MEASURES 5, 11 (Bo Lim & Erika Spanger-Siegfried eds., 2004); Camacho, *supra* note 95, at 16; Hans-Martin Füssel & Richard J. T. Klein, *Climate Change Vulnerability Assessments: An Evolution of Conceptual Thinking*, 75 CLIMATE CHANGE 301, 321-22 (2006); S. Mark Howden et al., *Adapting Agriculture to Climate Change*, 104 PROC. NAT'L ACAD. SCI. 19691, 19695 (2007)).

<sup>112</sup> See generally Camacho, *supra* note 95; Craig, *supra* note 33; J.B. Ruhl, *Climate Change Adaptation and the Structural Transformation of Environmental Law*, 40 ENVTL. L. 363 (2010); see also MOORE ET AL., *supra* note 86, at 66 (“The theory of an *adaptive management* approach to natural resource management, developed in the 1970s, can be understood as a ‘systematic, rigorous approach for deliberately learning from management actions with the intent to improve subsequent management policy or practice’”) (quoting *Defining Adaptive Management*, B.C. MINISTRY OF FORESTS AND RANGE, <http://www.for.gov.bc.ca/hfp/amhome/Admin/index.htm> (last visited Mar. 12, 2013)).

<sup>113</sup> McDonald, *supra* note 85, at 36-37.

<sup>114</sup> MOORE ET AL., *supra* note 85, at 45-46 (citing *Defining Adaptive Management*, *supra* note 112).

<sup>115</sup> Craig, *supra* note 33, at 40.

<sup>116</sup> Heltberg et al., *supra* note 95, at 94-95.

<sup>117</sup> Camacho, *supra* note 95, at 49-50 (footnote omitted).

Scenario planning is a decision-making tool that can encourage reasonable conduct in the face of the foreseeable risks of climate change for which robustness is the goal.<sup>118</sup> It is most useful in situations of high uncertainty.<sup>119</sup> In short, scenario planning “incorporates the best available information on climatic and socio-economic trends to create multiple, plausible future scenarios built on the variables of highest concern” for the relevant decision makers.<sup>120</sup> Agencies like the National Park Service currently employ this tool and “bring[] together scientists, resource managers, and other stakeholders to develop a small number of internally consistent, plausible narratives (*scenarios*) based on the best available science regarding future climate conditions for a given system of interest.”<sup>121</sup> A combination of scenario planning and adaptive management’s iterative processes is likely the most effective approach for decision makers.<sup>122</sup>

These methods still give “principled”<sup>123</sup> latitude to local governments to introduce a rigorous approach to adaptation that is at least above some reasonable baseline.<sup>124</sup> Introduction of substantive recommendations, such as “No Adverse Impact” (“NAI”), could reduce liability if, despite the climate forecast, municipalities still must occupy flood hazard areas.<sup>125</sup> Consistent with contemporary common law rights and duties,<sup>126</sup> “[NAI] floodplain management is an approach which ensures that the action of one property owner does not adversely impact the properties and rights of other property owners, as measured by increased flood peaks, flood stage, flood

<sup>118</sup> MOORE ET AL., *supra* note 85, at 1.

<sup>119</sup> *Id.*

<sup>120</sup> *Id.* at ii. “*Scenario* . . . refers to a description of a future built on the variables critical to decision-making, considering different projections of highly uncertain trends on a backdrop of highly certain trends. In scenario planning, managers create a variety of scenarios, and then consider in depth a small number of varied but equally plausible futures.” *Id.* at 2 (footnote omitted) (citing PETER SCHWARTZ, *THE ART OF THE LONG VIEW: PATHS TO STRATEGIC INSIGHT FOR YOURSELF AND YOUR COMPANY* (1991)); see also Farber, *supra* note 87, at 933 (“[S]cenario planning . . . identifi[ies] unacceptable courses of action and then choose[s] the most appealing remaining alternatives.”). Farber recommends “RAND’s Robust Decision Making . . . technique [to] provide[] a systematic way of exploring large numbers of possible policies to identify robust solutions.” *Id.* at 933.

<sup>121</sup> MOORE ET AL., *supra* note 85, at 40 (footnote omitted) (citing Katherine Waser, *Scenario Planning and the National Park Service*, SW. CLIMATE CHANGE NETWORK (Aug. 12, 2009), <http://www.southwestclimatechange.org/solutions/adaptation/nps-scenario-planning>; NAT’L PARK SERV., SUMMARY: CLIMATE CHANGE SCENARIO PLANNING WORKSHOP 3-8 (2007); SCHWARTZ, *supra* note 120).

<sup>122</sup> MOORE ET AL., *supra* note 85, at 42. These, along with multiscalar and interagency collaboration, would be optimal.

<sup>123</sup> Craig, *supra* note 33, at 63 (“Promote [p]rincipled [f]lexibility in [r]egulatory [g]oals and [n]atural [r]esource [m]anagement.”).

<sup>124</sup> England, *supra* note 20, at 220.

<sup>125</sup> KUSLER, *supra* note 63, at 50.

<sup>126</sup> KUSLER & THOMAS, *supra* note 49, at 4. With increasingly fewer exceptions, “[a]t common law, no landowner (public or private) has a right to use his or her land in a manner that substantially increases flood or erosion damages on adjacent lands . . . .” *Id.*

velocity, and erosion and sedimentation.”<sup>127</sup> NAI is “a general guide for landowner and community actions (construction of public works, use of public lands, planning, regulations) in the watersheds and the floodplains” that requires communities to understand potential development impacts and implement loss mitigation programs proactively.<sup>128</sup> With the NAI approach, communities seek to avoid an increase of flood-related impacts, development permitting, and other activities.<sup>129</sup>

When applied to discrete cases that represent a spectrum of scenarios that climate change presents, the potential efficacy of the substantive and procedural approaches discussed above becomes clearer.

### B. *Easier Cases*

Because of the super-wicked<sup>130</sup> nature of climate change, it would be naïve to characterize any of the circumstances that it raises as easy. Yet, relatively speaking, some duty- and breach-related questions will be more straightforward to address than others, even under changed circumstances. The first involves situations in which courts have already addressed and resolved the relevant liability questions. The clearest examples are suits against governments for increased natural hazards or hazard risks resulting from government drainage ditches, fills, or structural flood hazard reduction measures.<sup>131</sup> When a government acts in its capacity as a landowner it is similarly obligated.<sup>132</sup> This will remain relevant under climate-change conditions.

While a government cannot skirt its obligations with respect to public works projects that it has already undertaken that increase flooding, erosion, or other hazards on other lands, it can avoid liability—that is, act reasonably—by not increasing flood hazards by building infrastructure in hazard-risk areas.<sup>133</sup> This curtailment of public works projects will avoid reliance of property owners on public infrastructure—and the accompanying common law duty to do it well—and limit development in high-risk coastal areas.<sup>134</sup>

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<sup>127</sup> *Id.* at 6.

<sup>128</sup> *Id.* Indeed, the Association of State Floodplain Managers “recommends that [NAI] . . . be the default management standard for community regulations.” *Id.* at 7.

<sup>129</sup> *Id.* at 4.

<sup>130</sup> See generally *supra* note 59 and accompanying text.

<sup>131</sup> See KUSLER, *supra* note 63, at 13.

<sup>132</sup> See *id.*

<sup>133</sup> See *id.* at 17.

<sup>134</sup> See City, *supra* note 64, at 1541 (explaining that “[s]tructural measures . . . may encourage development in areas adjacent to a protective structure, thereby resulting in higher losses when the structure fails”).

Clearer science on the impacts of climate change will subject local governments to far more property damage-related claims.<sup>135</sup> Using common law justifications for imposing duty will necessarily extend to climate-impacted scenarios, with a likely expansion of liability.<sup>136</sup> As the degree of risk increases because of climate change, so too will the standard of care. Therefore, local governments will have to act with greater precaution—and more resilient materials—to avoid a finding of breach. Lack of knowledge should not exculpate governments, as actual or constructive knowledge of climate risks will be the most basic demonstration of reasonable conduct. And, where governments must remain or expand into flood hazard areas, employing standards such as NAI may channel decision making toward nonnegligent and, more than likely, adaptive action.<sup>137</sup>

Another “easy” case concerns making determinations between competing adaptation responses. In short, municipalities should avoid maladaptation—that is, adaptation measures that increase individual or community vulnerability to climate change.<sup>138</sup> The directive is simple. Identifying and avoiding it will be far more difficult. Nonetheless, there are some examples that are instructive. Local governments should pursue the adaptation measure that has the least detrimental effect over the short and long term. For example, the choice between hard armoring and soft armoring demonstrates how the preferred measure of seawalls and coastal jetties is suboptimal when compared to the use of vegetation and other natural ecosystems to blunt the impacts of destructive erosion and storm surge.<sup>139</sup> Most recently, the presence of dunes along the shoreline helped to blunt the impacts of Sandy in some areas.<sup>140</sup> Hard shoreline armoring damages adjacent property over the long term and provides a false sense of security at the coastline,

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<sup>135</sup> Reports like BAKER & MCKENZIE anticipate and comprehensively identify and analyze such claims. *See generally* BAKER & MCKENZIE, *supra* note 18.

<sup>136</sup> *See infra* Part III.

<sup>137</sup> KUSLER, *supra* note 63, at 50 (advocating application of “a no adverse impact standard in locating and constructing public works, and, in regulating private activities”). Kusler includes more comprehensive recommendations for avoiding liability with respect to structural measures, including but not limited to: “incorporate[ing] a wide safety factor in all designs[;] . . . [c]onsider[ing] and publiciz[ing] residual risks”; use of “particular care” in maintenance and operation; and “[u]tiliz[ing] ‘future conditions’ for calculating flood flows.” *Id.* at 51.

<sup>138</sup> *See, e.g.,* Jon Barnett & Saffron O’Neill, Editorial, *Maladaptation*, 20 GLOBAL ENVTL. CHANGE 211, 211 (2010). Maladaptation, even if there are attempts to vigilantly avoid it, appears inevitable. With the array of possible climate futures, decision makers will make decisions that unwittingly increase vulnerability at times. For an interesting discussion regarding the likely increase in litigation based on “design flaw[s] or policy choice[s],” depending on your vantage point, *see* Verchick & Scheraga, *supra* note 106, at 248. I discuss the negligence of a well-intentioned local decision maker below.

<sup>139</sup> *See, e.g.,* Verchick & Scheraga, *supra* note 106, at 240, 250-51; City, *supra* note 64, at 1541.

<sup>140</sup> *See* Mireya Navarro & Rachel Nuwer, *Resisted for Blocking the View, Dunes Prove They Blunt Storms*, N.Y. TIMES, Dec. 4, 2012, at A1.

with the effect of encouraging further development along the coast.<sup>141</sup> In contrast, soft armoring, though it allows for landward creep of the coastline, provides many ecosystem services, including surge protection and water filtration.<sup>142</sup>

As a general rule, local governments should favor actions that have multiple benefits and should disfavor any adaptation action that increases path dependency.<sup>143</sup> Professor Robin Craig explains that “irreversible commitment too early to particular strategies as opposed to taking a more cautious, ‘no regrets’ approach at the outset is more likely to create path dependencies that could actually impede future adaptation and even survival.”<sup>144</sup> These dependencies are diverse and may include extensive physical structures or suboptimal economic arrangements.<sup>145</sup>

### C. *Harder Cases*

[Y]ou can’t make a climate-proof city.<sup>146</sup>

There are characteristics of climate change that are harder to tackle because they are unique to climate change and, therefore, have no historical analogue.<sup>147</sup> Further, a steady concept of successful adaptation is impossible to obtain, due in part to centuries-long inertia in the climate system and an inability to know the ultimate effectiveness of an intervention.<sup>148</sup> The most obvious problem is the issue of planning along appropriate timescales and coping with abrupt climate change, a novel and unprecedented element of global warming. Moreover, because of these and other difficulties, even well-intentioned decision makers will get it wrong on occasion and perhaps

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<sup>141</sup> Verchick & Scheraga, *supra* note 106, at 241.

<sup>142</sup> *Id.* at 250-51.

<sup>143</sup> Craig, *supra* note 33, at 40.

<sup>144</sup> *Id.* (footnote omitted).

<sup>145</sup> For example, the use of genetically modified organisms are often billed as an effective response to climate-induced impacts, particularly droughts and floods, but they can have a maladaptive effect by, among other things, reducing individual and community level resilience and biodiversity and simultaneously increasing dependence on external, global markets. Local farmers in the developing world, for example, would be at the whim of the potential price shocks resulting from a fluctuation in global seed prices. *See generally* Deborah B. Whitman, *Genetically Modified Foods: Harmful or Helpful?*, CSA DISCOVERY GUIDES (Apr. 2000), <http://www.csa.com/discoveryguides/gmfood/review.pdf>.

<sup>146</sup> Navarro, *supra* note 33, at A20.

<sup>147</sup> *See* McDonald, *supra* note 85, at 31. “What distinguishes the risk of irreversible consequences in climate change is the scale and unpredictability of the threat and the absence of any historical analogue.” *Id.* Irrespective of the presence of an analogue, local governments should choose aggressive action to avoid catastrophic and irreversible impacts.

<sup>148</sup> Moore, *supra* note 85, at 65 (explaining that “[c]limate change is an ongoing process, preventing a true ex post facto (outcome) evaluation of effectiveness of intervention, e.g., sea level will be rising for hundreds of years after greenhouse gases are stabilized in the atmosphere” (citation omitted)).

most of the time. The above discussion raises several questions: What time frame should one reasonably plan for when forecasts of impacts for the next 30, 50, and 100 years will almost certainly change as climate science improves? How do municipalities reasonably prepare for unknowable surprises, climate and otherwise?<sup>149</sup> And, how can the law impose a duty that does not penalize a climate-responsible municipality?

An exact answer to the above questions is not immediately clear, nor will the answer be uniform across planning horizons or locales. There are parameters that one can logically put in place with respect to time scales. Professor Andrew Macintosh provides a helpful, if a bit obvious, standard for near-term impacts. “Where there is an immediate risk of inundation,” he explains, “common sense applies—governments should not allow development that is at a high risk of destruction from natural causes.”<sup>150</sup> Finding the optimal course of action for more distant inundation arising from climate change is more challenging, Macintosh admits.<sup>151</sup> He continues, however, by advocating a rule of thumb that counsels that delay is likely more “appropriate when the adaptation in question involves projects with short lead times, short cost/benefit lifetimes and reversible impacts.”<sup>152</sup> Early action is likely more appropriate in “projects with long lead times, long cost/benefit lifetimes and irreversible impacts.”<sup>153</sup> For this kind of deliberation and decision making, it would make the most sense to rely on the principles and attendant processes of adaptive management to get municipalities to the best, nonnegligent course of action. A well-established governance infrastructure for adaptive management might also shield the well-intentioned municipality from liability. If that process is working optimally, the existence of a functional process alone may fulfill the reasonable conduct requirement. Further, the relevant decision makers can assess and measure provisional outcomes of a planning decision against the needs of existing circumstances and revise accordingly.<sup>154</sup>

Adaptive management’s deliberative nature makes it less well suited to deal with climate surprises.<sup>155</sup> Scenario planning would be appropriate here. Municipalities can consider climate extremes, including those at the very

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<sup>149</sup> See *id.* at 46 (recommending that decision makers expect and prepare for climate surprises); see also *id.* at 2 (explaining that “[c]limate models are not well-suited for demonstrating some aspects of climate such as extremes, interactions, and feedback effects, and do not take into account decision-critical factors that fall outside the climate system, such as political will or budgetary constraints”).

<sup>150</sup> Macintosh, *supra* note 105, at 51.

<sup>151</sup> *Id.*

<sup>152</sup> *Id.* at 61.

<sup>153</sup> *Id.*

<sup>154</sup> See Moore, *supra* note 85, at 65 (explaining that “[t]he outcome of a certain intervention can be measured against observable impacts at a given point in time, . . . [and] evaluation criteria and associated indicators [will measure] . . . the design, process, outputs, and provisional outcomes of an intervention”).

<sup>155</sup> Camacho, *supra* note 112, at 25-26.

end of the fat tail, to work through a plan they would operationalize in the event of abrupt change or surprise.

#### D. *Wicked Cases*

The most difficult cases might well be anthropogenic.<sup>156</sup> In other words, despite the grave climate forecast, the more formidable obstacles to finding a comprehensive and coherent, while appropriately rigorous, adaptation approach—and the standard of care that would undergird it—may be the circumstances that implicate long-standing political chasms. Here, retreat from the coastline serves as a paradigmatic example.<sup>157</sup> “Retreat” describes government actions that discourage new development in disaster prone areas or reconstruction following such disasters—that is, proactive and reactive retreat, respectively.<sup>158</sup> Local governments are the “primary actors” in implementing retreat policies as they make land-use decisions necessary to facilitate retreat.<sup>159</sup> Even municipalities that confess a relatively strong commitment to climate-change adaptation—demonstrated by bike lanes, reduced energy use in buildings, and bans on the dirtiest home heating oils—consistently govern in opposition to retreat from the shoreline.<sup>160</sup> Retreat remains among the most optimal responses to coastal hazards set to worsen as climate change progresses,<sup>161</sup> yet it lacks the political will to come up for serious deliberation, much less succeed.<sup>162</sup>

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<sup>156</sup> See, e.g., John R. Nolon, *Regulatory Takings and Property Rights Confront Sea Level Rise: How Do They Roll?*, 21 WIDENER L.J. 735 (2012).

<sup>157</sup> While the very thorny issues around takings are relevant, I do not tackle them here. Numerous scholars have considered the issue of takings in the context of climate change and coastal retreat. See, e.g., DOUGLAS CODIGA ET AL., CLIMATE CHANGE AND REGULATORY TAKINGS IN COASTAL HAWAII (2011); Nolon, *supra* note 156; Verchick & Scheraga, *supra* note 106. For the most part, the discussion of takings, climate change, and local government regulation of the coastline suggests that takings concerns are overstated. See, e.g., City, *supra* note 64, at 1569 (“Despite the fear of takings claims, the premise that local government may reduce hazard risk through the regulation of private property is generally sound.”).

<sup>158</sup> See Verchick & Scheraga, *supra* note 106, at 239.

<sup>159</sup> J. Peter Byrne & Jessica Grannis, *Coastal Retreat Measures*, in THE LAW OF ADAPTATION TO CLIMATE CHANGE, *supra* note 71, at 267, 268.

<sup>160</sup> See Navarro, *supra* note 33, at A20 (describing New York’s inconsistent adaptation measures).

<sup>161</sup> See, e.g., J. Peter Byrne and Jessica Grannis, *Coastal Retreat Measures*, in THE LAW OF ADAPTATION TO CLIMATE CHANGE, *supra* note 71, at 267; see also BAKER & MCKENZIE, *supra* note 18, at 10 (discussing the need “to minimise development in highly vulnerable areas”).

<sup>162</sup> See Rudolf et al., *supra* note 35 (“Instead of spending money to protect what we already have, experts also suggest there’s another interim step just awaiting the political will to see it through: stop building more homes and businesses where they too will require protection.”).



Balancing retreat against the current approaches of armoring, rebuilding, and starting all over again<sup>163</sup> increasingly demonstrates that reasonable conduct will militate in favor of actively moving away from the coasts. State and local governments, as well as the federal government,<sup>164</sup> have spent disproportionately on short-term coastal protection projects rather than on retreat efforts, such as buyout programs endorsed by many researchers and analysts that would discourage new development in the most hazardous areas.<sup>165</sup> For instance, one could argue that local governments along the Jersey Shore are not governing reasonably when they neither seriously consider nor actively pursue retreat through regulation. Further, the costs of continuing to encourage new and existing development on the coast may even eclipse the cost of acquisition, which is now prohibitively expensive.<sup>166</sup>

At the moment, these issues may be beyond the reach of the courts as nonstructural<sup>167</sup> and policy-oriented planning decisions, for which courts do not uniformly find a cognizable duty or, if they do, they allow immunity to apply, respectively.<sup>168</sup> Expanded liability appears to be an emerging trend,<sup>169</sup> however, which may have serious implications for local governments that do not opt for the most climate-adaptive conduct in light of the high degree of risk to person and property.

### III. DISCRETION, CAPTURE, AND PUBLIC POLICY

If duty is truly “an expression of the sum total of [policy] considerations” that incites the law to recognize a plaintiff’s “entitle[ment] to protection,”<sup>170</sup> and climate change is perhaps the single greatest threat to well-being, a discussion of key policy considerations is necessary. This Part

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<sup>163</sup> “New Jerseyization” provides a perfect example of this Sisyphean process. *Id.* “Hard structures are now present along nearly 80 percent of [New Jersey]’s coastline.” *Id.*

<sup>164</sup> See Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-20 (2006); National Flood Insurance Program, 42 U.S.C. §§ 4001-129.

<sup>165</sup> Rudolf et al., *supra* note 35.

<sup>166</sup> Byrne & Grannis, *supra* note 159, at 269. The cost also includes the loss of significant property tax revenues local governments receive, which themselves fuel continued development. *Id.* at 270.

<sup>167</sup> See KUSLER, *supra* note 63, at 5 (explaining that governments have been held liable in only a “small number of cases for nonstructural loss reduction measures . . . due to explicit liability exemptions” as well as degree of discretion inherent in some of the measures); see also *id.* at 51 (providing recommendations for local governments to avoid liability when making decisions regarding nonstructural measures).

<sup>168</sup> *Id.* at 11; see also *In re Katrina Canal Breaches Litigation*, 696 F.3d 436, 448-49 (5th Cir. 2012) (discussing the Discretionary Function Exception to the Federal Tort Claims Act).

<sup>169</sup> See Adam Liptak, *Justices Broaden the Basis for Damages Over Floods*, N.Y. TIMES, Dec. 4, 2012, at A23.

<sup>170</sup> See Hunter & Salzman, *supra* note 86, at 1748 n.32 (quoting *Brennen v. City of Eugene*, 591 P.2d 719, 722 (Or. 1979)).

briefly considers the value of legally recognizing a more expansive duty vis-à-vis climate adaptation and a relaxation of immunity, which stymies long-standing goals of tort law and provides a shield that aids local governments in discrete instances in the short term, but that may ultimately have the effect of gravely increasing vulnerability to climate change.<sup>171</sup>

In some circumstances, courts will consider public policy when they decide whether to hold governments liable for flood damage.<sup>172</sup> Often resolution in these types of cases mirrors the immunity afforded the Army Corp of Engineers in the recent case of *In re Katrina Canal Breaches Litigation*.<sup>173</sup> In its most recent opinion, the Fifth Circuit reversed its earlier ruling to find that the Discretionary Function Exception to the waiver of sovereign immunity shielded the Army Corp of Engineers from liability for property losses suffered by landowners occupying lands adjacent to the infrastructure Hurricane Katrina compromised.<sup>174</sup> The Discretionary Function Exception under the Federal Tort Claims Act bars lawsuits on the claims that are “based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a federal agency or an employee of the Government, whether or not the discretion involved be abused.”<sup>175</sup> This stark reversal from the court’s earlier opinion suggests that policy may well have been at play during adjudication as well.<sup>176</sup> On the one hand, crushing liability is a formidable argument for finding no liability. On the other hand, and in light of climate-change impacts, deterring and punishing conduct resulting in loss of life and property is a significant counterpoint and warrants the highest order of protection in American jurisprudence. As James Wilkins argues, “[a]t some point, when the social costs of allowing development to proceed in harm’s way outweighs the deference afforded to governments in their planning decisions by the law and the courts, governments will begin to incur liability for their failure to protect public safety.”<sup>177</sup>

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<sup>171</sup> A full exploration of this last point warrants another article-length discussion. Space does not allow here, but I attempt to raise a few of the major points.

<sup>172</sup> See KUSLER, *supra* note 63, at 15.

<sup>173</sup> 696 F.3d 436 (5th Cir. 2012).

<sup>174</sup> *Id.* at 451.

<sup>175</sup> *Id.* at 448-49 (quoting 28 U.S.C. § 2680(a) (2006)).

<sup>176</sup> For one perspective on the rule, see generally Robert Verchick, *Fifth Circuit’s Reversal on Katrina Litigation Leaves Flood Victims Gasping for Air*, PROGRESSIVE REFORM (Sept. 27, 2012), <http://www.progressivereform.org/CPRBlog.cfm?idBlog=08E62277-9773-4CA1-85E69FD4E5843072> (stating that the reversal could “narrow[] the chances that the government can be held accountable for even the most pedestrian mistakes”).

<sup>177</sup> Wilkins, *supra* note 15, at 497. Decisions like *Cootey v. Sun Investment, Inc.* in especially vulnerable places like Hawai’i would not remain good law under Wilkins’s persuasive construction of relative costs. See *Cootey v. Sun Inv.*, 718 P.2d 1086, 1092 (Haw. 1986) (holding that a county government was not liable for approving flooded subdivision plans as there was no breach of a duty of care).

The arguments against greater liability for local governments may be overstated or, in the alternative, feasible to plan around. The predominant argument against liability concerns the cost of such liability.<sup>178</sup> Scholars have argued that these concerns are overstated.<sup>179</sup> This argument does not weigh the cost of disaster mitigation against the hazard-induced losses that municipalities might have prevented. In many cases, the latter far outweighs the former.<sup>180</sup> This is significant because adaptation litigation, to the extent that its success relies on expanded liability, would not benefit from bankrupting the local governments that need to expend resources on adapting to climate change. Negligence actions themselves are costly and time consuming for both plaintiffs and defendant municipalities.<sup>181</sup> It is certainly the intention of adaptation litigation as contemplated by this Article to inspire better government planning so as to reduce litigation and instigate sound adaptation processes.<sup>182</sup> Litigation and court-imposed liability should serve primarily to provide a more palpable understanding of the financial costs of failing to adapt.

Litigation might also provide much needed “cover” for well-intentioned governments that would like to turn their attention to adaptation but recognize a persistent lack of mandate from the community and political will—and concomitant resource support—at the state and federal level.<sup>183</sup> It would also halt a key component of the “structural bias”<sup>184</sup> toward development in increasingly risky areas. Real estate interests are a powerful lobby in many coastal communities, including New Jersey.<sup>185</sup> In the context of SLR risks facing New York City’s coastline, one policy analyst stated that “[t]here’s a lot of concern about angering developers.”<sup>186</sup> Further, lobbying and state campaign finance data suggest great development interests wield great influence.<sup>187</sup> To the extent that governments enjoy immunity when they make decisions regarding policy, the law must remain mindful of

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<sup>178</sup> See City, *supra* note 64, at 1563-64 (referencing the objection that imposing liability could make local governments the insurers of private property owners).

<sup>179</sup> See, e.g., *id.*

<sup>180</sup> *Id.* at 1564.

<sup>181</sup> For plaintiffs, it is so much so that some researchers have cited the social justice implications of adaptation litigation. See McDonald, *supra* note 85, at 22-23 (noting that adaptation laws need to be designed so as to “not exacerbate existing drivers of social and economic vulnerability”). This is certainly true and would limit claims to wealthier litigants. The deterrent effects of these actions and the prodding to adapt more effectively would, optimistically, benefit all community members. Further, these claims would be favorable for impact litigants as modeled by the plaintiffs in *Native Village of Kivalina v. ExxonMobil Corp.* 696 F.3d 849, 853 (9th Cir. 2012).

<sup>182</sup> See Lachman, *supra* note 22, at 980.

<sup>183</sup> There might also be concern regarding litigation from other property owners who bring takings claims. See *supra* note 157; see also Burkett, *supra* note 1, at 11153 n.110.

<sup>184</sup> City, *supra* note 64, at 1572.

<sup>185</sup> See Rudolf et al., *supra* note 35.

<sup>186</sup> Navarro, *supra* note 33, at A20.

<sup>187</sup> See Rudolf et al., *supra* note 35.

the political milieu in which state and local entities and their government agencies must deliberate.<sup>188</sup> Liability can retard the type of “capture”<sup>189</sup> that allows development considerations to occur in isolation of increasing dangers in flood zones and at the coastline.<sup>190</sup>

## CONCLUSION

Litigation has great normative power. Adaptation litigation, which may now be inevitable, may have the power to set enduring, yet constantly evolving, standards for climate-change adaptation in order to meet the climate risk. To get into the courtroom, however, the law must recognize that the foreseeability of a grave risk coupled with myriad and quite compelling social costs and policy concerns militate in favor of expanded tort duties for local governments. This is also an opportunity that local communities cannot afford to miss. The costs of climate impacts—particularly to the most geographically and socioeconomically vulnerable—will dwarf the costs of preparing coupled with the value of adaptation’s co-benefits. Municipalities can either pay now or pay dearly later.

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<sup>188</sup> Lachman, *supra* note 22, at 971 (“The purposes of municipal liability are to make the injured party whole and to deter future harmful conduct by the municipality. Municipal liability is not about governmental units serving as guarantors of the actions of private developers, but rather as guarantors of their own permitting decisions.”).

<sup>189</sup> See, e.g., George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3, 3 (1971) (postulating that “regulation is acquired by the industry and is designed and operated primarily for its benefit”).

<sup>190</sup> This is of course also true for development in wildfire “red zones.” See, e.g., Kudas, *supra* note 10 (describing where wildfire-potential forests meet densely populated areas).