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Deconstructing Disaster

Justin Pidot

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Deconstructing Disaster

Justin Pidot*

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ABSTRACT

Over time, we have grown increasingly vulnerable to natural disasters. Each decade, economic losses from such disasters more than double as people continue to build homes, businesses, and other physical infrastructure in hazardous places. Yet public policy has thus far failed to address the unique problems posed by natural disasters. This Article takes a first step toward improving public policy by offering a paradigm for understanding its failures, suggesting that three categories of obstacles obstruct sensible government regulation.

Drawing from philosophy, cognitive psychology, history, anthropology, and political science, this Article identifies and analyzes three categories of obstacles to disaster policy—symbolic obstacles, cognitive obstacles, and structural obstacles. The way we talk about natural disaster, the way we think about the risks of building in hazardous places, and structural aspects of American political institutions all favor development over restraint. Indeed, these forces have such strength that in most circumstances society automatically

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and thoughtlessly responds to natural disasters by beginning to rebuild as soon as a disaster has occurred.

The types of obstacles discussed in this Article interact and amplify one another, further impeding policymaking. The history of disaster policy suggests that efforts to respond to any one obstacle will likely fail. Only by understanding these obstacles collectively, and by coordinating responses to their individual and cumulative effects, can America effectively tackle the natural disaster problems it faces.

I. INTRODUCTION

On October 29, 2012, Superstorm Sandy swept through the northeastern United States. Coastal communities experienced a record-setting storm surge that reached more than thirteen feet.¹ Waves topped thirty feet outside of New York Harbor and grew to almost forty feet in Atlantic City, New Jersey.² In all, parts of seven states received more than five inches of rain during the storm's course.³ This rare event swept through many of the same areas devastated only the year before by Hurricane Irene,⁴ causing New York Governor Andrew Cuomo to quip "we have a 100-year flood every two years now."⁵

Natural disasters are a recurring feature of the American experience. In 2011 there were ninety-nine federally declared, major natural disasters in the United States.⁶ They came in all shapes and

1. National Hurricane Ctr., *Post-Tropical Cyclone SANDY Update Statement* (Oct. 29, 2012), available at <http://www.nhc.noaa.gov/text/refresh/MIATCUAT3+shtml/292256.shtml>.

2. See *The Stats Are in: Superstorm Sandy Totals*, ACCUWEATHER.COM (Nov. 1, 2012), <http://www.accuweather.com/en/weather-news/sandy-statistics-rain-wind-snow/876665>; National Hurricane Ctr., *Post-Tropical Cyclone SANDY Update Statement* (Oct. 29, 2012), available at <http://www.nhc.noaa.gov/text/refresh/MIATCUAT3+shtml/292256.shtml>.

3. *Id.*

4. See, e.g., David Ariosto, *First Irene, Then Sandy: Jersey City Recovers, Again*, CNN WIRE (Nov. 14, 2012), <http://www.cnn.com/2012/11/14/us/new-jersey-irene-sandy/>.

5. Jimmy Vielkind, *Cuomo: Need to Rebuild for 'New Reality'*, CAPITOL CONFIDENTIAL (Oct. 31, 2012), <http://blog.timesunion.com/capitol/archives/162627/cuomo-we-need-to-plan-rebuild-for-new-reality>.

6. See *Natural Disasters: Counting the Cost of Calamities*, ECONOMIST, Jan. 14, 2012, at 60. The year 2011 was a record year for disasters, but other years are not far behind. There were, for example, seventy-eight disaster declarations in 2004. See E.L. Quarantelli, et al., *A Heuristic Approach to Future Disasters and Crises: New, Old, and In-Between Types*, in *HANDBOOK OF DISASTER RESEARCH* 16, 35 (Havian Rodriguez, et al., eds. 2006). By some estimates, more than 200 natural catastrophes occur each year around the globe. *Id.* at 18.

sizes: wildfires, floods, blizzards, hurricanes, and earthquakes.⁷ Hurricane Irene is a good example, tearing through New England at the end of August 2011. In the wake of the storm, streams and rivers flooded, destroying homes, businesses, and roads, and causing over \$15 billion in damage.⁸ Hurricane Irene, like the other ninety-eight major disasters of 2011,⁹ was a tragedy for many people. Like most natural events that result in massive economic loss, the storm was also a predictable, albeit rare, event. Much of the flooding that swept away memories and livelihoods occurred in areas predicted to flood, on average, once every hundred years.¹⁰ But, as Governor Cuomo recognized, such floods sometimes strike in rapid succession.¹¹

These events are referred to as “natural” disasters because they are precipitated by natural forces. But the behavior of humans—where we locate and how we build our homes, businesses, and roads—plays a leading role in transforming events into disasters.¹²

7. See *Natural Disasters: Counting the Cost of Calamities*, *supra* note 6 at 60; *Storm Leaves Trail of Snow, Ice, Power Outages, Freezing Temperatures*, ABC NEWS (Oct. 30, 2012 3:23 PM), <http://abcnews.go.com/US/blizzard-2011-mega-snowstorm-pounds-midwest-snow-ice/story?id=12818948#UJAK12I25Vg>.

8. *Costliest U.S. Hurricanes*, WUNDERGROUND (Oct. 25, 2012, 5:43 PM), <http://www.wunderground.com/hurricane/damage.asp>. By the time Hurricane Irene reached New England, its winds had slowed enough that it had become a tropical storm. See Marc Santora, *High and Dry?*, N.Y. TIMES, Oct. 2, 2011, at Section RE. This Article refers to the storm in total as “Hurricane Irene” to avoid confusion.

9. *Disaster Declarations by Year*, FEMA.GOV, <http://www.fema.gov/disasters/grid/year> (last visited Nov. 2, 2012).

10. See, e.g., Jeff Masters, *Irene's 1-in-100 Year Rains Trigger Deadly Flooding*, WUNDERBLOG (Aug. 29, 2011, 4:00 PM), <http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=1908>.

11. Repeated flooding in hundred-year-flood plains can occur for one of two reasons. First, as a matter of pure probability, the chances of such flooding occurring in consecutive years is one in one thousand, reasonable odds in light of the extensive network of floodplains that occur in the United States. See, e.g., Mark Crowell, et al., *An Estimate of the U.S. Population Living in 100-Year Coastal Flood Hazard Areas*, 26 J. COASTAL RES. 201, 208 (2010) (estimating that more than eight million people live in areas subject to a one-percent risk of coastal flooding). Second, estimates of the likelihood of flooding may quickly become out of date as new development increases flood risk. See *infra* note 26.

12. See DANIEL A. FARBER ET AL., *DISASTER LAW AND POLICY* 3 (2d ed. 2010). As Daniel Farber and his colleagues have explained, “[M]ost serious students of disaster have moved from defining a disaster as the hazardous event itself to defining a disaster in terms of the impact that the hazardous event has on people and property—an impact that is determined not only by the magnitude of the event, but also by human interaction with nature, by our choices about where and how we live.” *Id.* Recognizing the responsibility of human decision making, some have proposed that the term “nature-induced disaster” more accurately captures the phenomenon. See Christian Pfister, *Learning from Nature-Induced Disasters, Theoretical Considerations and Case Studies*

Hurricane Irene's rain may have caused rivers and streams to overtop their banks, but a flood only becomes a disaster if human infrastructure lies in its path.¹³ Indeed, the armoring of rivers, hardening of floodplains, and development of watersheds increases the severity of the flood itself. In a very real sense, the strength of Hurricane Irene, at least as people experienced it, was the result of policies that facilitated and permitted development in floodplains. Natural disasters are, then, significantly a function of the built environment, rather than stochastic natural forces.

Scholars have long recognized the role humans play in transforming natural events into natural disasters. As Phil O'Keefe and his colleagues wrote in a 1976 path-breaking article in the journal *Nature*, "[w]ithout people there is no disaster."¹⁴ O'Keefe recognized the profundity of this realization and argued that "[t]he time is ripe for some form of precautionary planning which considers vulnerability of the population as the real cause of disaster—a vulnerability that is induced by socio-economic conditions that can be modified by man, and is not just an act of God."¹⁵

Unfortunately, in the thirty-five years since, society has done a poor job accounting for its starring role in the genesis of natural disaster. There have been repeated calls for reform.¹⁶ Most recently, a joint committee of the National Academies of Sciences, the National Academy of Engineering, and the Institute of Medicine released a report entitled "Disaster Resilience: A National Imperative," reiterating the importance and urgency of reducing the nation's vulnerability to natural disasters.¹⁷ Notwithstanding this

from *Western Europe*, in NATURAL DISASTERS, CULTURAL RESPONSES, 17, 18 (Christof Mauch & Christian Pfister eds., 2009). This Article uses the familiar nomenclature because of its widespread adoption.

13. See, e.g., Christof Mauch, *Introduction* to NATURAL DISASTERS, CULTURAL RESPONSES, *supra* note 12, at 4 (explaining that natural disasters "should be understood as both physical events and social or cultural occurrences").

14. Phil O'Keefe et al., *Taking the Naturalness Out of Natural Disasters*, 260 NATURE 566, 566 (1976).

15. *Id.* at 567.

16. DENNIS S. MILETI, *DISASTERS BY DESIGN: A REASSESSMENT OF NATURAL HAZARDS IN THE UNITED STATES* 2 (1999) (arguing that in light of sustained failure to reduce losses from disaster "the nation must shift to a policy of 'sustainable hazard mitigation'").

17. THE NATIONAL ACADEMIES, *DISASTER RESILIENCE: A NATIONAL IMPERATIVE* vii (2012) (arguing that the nation should "embark on a new path—one that . . . recognizes and rewards the values of resilience to the individual, household, community, and the nation"). Notably, many of the policy prescriptions advocated for by those concerned with disaster policy remain

sustained concern with disaster vulnerability, development continues at an explosive pace in areas of extreme hazard. Florida, for example, a state facing hurricane risk so severe that private insurance companies have largely refused to issue policies covering wind damage, has also experienced one of the highest growth rates in the country.¹⁸ Within Florida, development is concentrated in counties facing particularly acute hurricane risks. The National Oceanic and Atmospheric Administration estimates that St. Lucie County will be struck by a hurricane an average of once every eight years and a major hurricane an average of once every nineteen years.¹⁹ Yet the population in St. Lucie County increased by more than forty percent between 2000 and 2010, as did the number of housing units.²⁰ The same is true of development subject to other natural hazards. Living along the boundary between urban areas and wild lands has become increasingly popular, despite the high risk posed by wildfire. The Department of Agriculture predicts that by 2030 more than 2.2 million homes will be located at the fire-prone, wildness-urban

relatively constant. These strategies include implementation of stronger building codes, better land-use planning through local zoning decisions to channel development away from hazard-prone areas, and use of insurance instruments to better price risk. *See id.* at 179–180, 182–83; MILETI, *supra* note 16, at 155–74.

18. *See, e.g.,* JUSTIN R. PIDOT, COASTAL DISASTER INSURANCE IN THE ERA OF GLOBAL WARMING: THE CASE FOR RELYING ON THE PRIVATE MARKET 8, 11 (2007) (identifying decisions by insurance companies to stop providing insurance in certain hurricane-prone areas, including Florida); Howard C. Kunreuther & Erwann O. Michel-Kerjan, *Climate Change, Insurability of Large-Scale Disasters, and the Emerging Liability Challenge*, 155 U. PA. L. REV. 1795, 1810 (2006) (explaining that in the wake of the 2004–2005 hurricane season “insurers and reinsurers are reexamining their ability to provide protection against wind damage from hurricanes and are asking whether these events are insurable, and if so, at what price”); *see also* Julie Patel, *State Farm Dumps Policies into Citizens*, SUN SENTINEL, Oct. 19, 2011 (describing growth in number of state-backed wind insurance policies as largest private insurer in Florida shed coverage).

19. *See* Return Period Hurricane, http://www.nhc.noaa.gov/climo/images/return_hurr.jpg (last visited Sept. 11, 2012); Return Period Major Hurricane, http://www.nhc.noaa.gov/climo/images/return_mjrhurr.jpg (last visited Sept. 11, 2012). This information about direct strikes underestimates risks to development because it does not include indirect strikes or tropical storms.

20. According to the 2000 census, there were 192,695 people and 91,262 housing units in St. Lucie County. The 2010 census reports 277,789 people and 137,029 housing units. *See* U.S. CENSUS, available at <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml> (select “Geographies” button; then select “County” from drop down menu; then select “Florida;” then select “St. Lucie County;” then select the “Population” link; to change census years select the “Topics” link).

interface in the Rocky Mountains, a forty percent increase from 2006.²¹

In light of abundant documentation of the risk of building in areas subject to natural hazards and repeated calls for reform, why do we remain on a reckless course that places more people, buildings, and infrastructure in harm's way? This Article takes up that important question, identifying three categories of obstacles that impede the adoption of thoughtful, proactive policies to guide development in hazardous areas. These categories—symbolic, cognitive, and structural—reinforce one another, collectively causing society to make bad decisions both before disaster strikes and in its wake.

In discussing these obstacles, I do not write on an entirely blank slate. Others have considered patterns of thinking and structures of government that impede disaster policy.²² But this Article's comprehensive and structured approach offers important lessons for those seeking to enact reform. It offers the critical insight that symbolic, cognitive, and structural obstacles reinforce one another, and, moreover, explains how this cumulative effect occurs. So, for example, the symbolic importance attached to reconstruction in the wake of disaster may reinforce cognitive mechanisms that distort perceptions of risk. In turn, these cognitive mechanisms may amplify policy distortions created by structural aspects of the government entities charged with formulating disaster policy. As a result, creating regulation that embodies a sustained commitment to reduce vulnerability to natural disaster is likely to succeed only if it is supported by policies that account for all three of the obstacles identified here and their interactions.

In light of this reality, better understanding the obstacles facing disaster policy will enable society to respond to natural hazards more appropriately. Each type of obstacle lends itself to different responses. Symbolic obstacles generally require a discursive remedy.

21. U.S. DEP'T OF AGRIC., OFFICE OF INSPECTOR GEN., WESTERN REGION, AUDIT REPORT: FOREST SERVICE LARGE FIRE SUPPRESSION COSTS, Rep. No. 08601-44-SF, at 6 (2006).

22. See, e.g., Raymond J. Burby, *Hurricane Katrina and the Paradoxes of Government Disaster Policy: Bringing About Wise Governmental Decisions for Hazardous Areas*, 604 ANNALS AM. ACAD. POL. & SOC. SCI. 171, 173–81 (2006) [hereinafter Burby, *Paradoxes*] (arguing that natural disaster policy suffers from a "safe development paradox" and a "local government paradox"); Howard Kunreuther & Mark Pauly, *Neglecting Disaster: Why Don't People Insure Against Large Losses?*, 28 J. RISK & UNCERTAINTY 5, 6–7 (2004) (contending that limited information, transaction costs, and assumptions that low-level risks will not occur lead to underinsurance).

Cognitive obstacles require debiasing strategies to correct for systematic errors of cognition. Finally, structural obstacles require redesigning political institutions responsible for disaster policy. A comprehensive policy that harnesses multiple strategies to address all three obstacles is most likely to result in a successful and sustained effort to reduce vulnerability to natural disaster.

Existing approaches to disaster policy have failed, at least in part, because they have failed to account for all three obstacles and the interaction among them. Consider, for example, the National Flood Insurance Program (NFIP), which requires communities to impose standards for new construction within one-hundred-year floodplains to enable their residents to purchase insurance.²³ Theoretically, the NFIP should lead to better development practices by pricing hazard risk. In reality, the NFIP has been a colossal failure, significantly increasing development in floodplains and resulting in staggering losses that must be paid by the federal treasury.²⁴ Critics of the NFIP have long blamed subsidized insurance premiums as largely responsible for this failure,²⁵ and there is little doubt that the practice of underpricing risk has encouraged development.²⁶ But the NFIP also does little to address structural obstacles to effective disaster policy.²⁷ Nor has the NFIP shifted the discourse

23. See, e.g., 44 C.F.R. § 60.3(c)(2) (requiring local governments to restrict new development in certain designated floodplains such that the “lowest floor (including basement) [is] elevated to or above the base flood level”); GOV’T ACCOUNTABILITY OFFICE, NATIONAL FLOOD INSURANCE PROGRAM: CONTINUED ACTIONS NEEDED TO ADDRESS FINANCIAL AND OPERATIONAL ISSUES, GAO-10-1063T, at 4 (2010) [hereinafter NFIP ACTIONS NEEDED] (providing background on NFIP).

24. See PIDOT, *supra* note 18, at 14–17; Raymond J. Burby, *Flood Insurance and Floodplain Management: The US Experience*, 3 ENVTL. HAZARDS 111, 116–17 (2001).

25. See Blake Hudson, *Reconstituting Land-Use Federalism to Address Transitory and Perpetual Disasters: The Bimodal Federalism Framework*, 2011 BYU L. REV. 1991, 2004 (arguing that through provision of “artificial insurance rates,” the federal government is “complicit[]” in “exacerbating disaster risks”); NFIP ACTIONS NEEDED, *supra* note 23, at 6 (“[T]he number of policies receiving subsidized rates has grown steadily in recent years and without changes to the program will likely continue to grow, increasing the potential for future NFIP operating deficits.”).

26. See PIDOT, *supra* note 18, at 14–15. The federal government’s failure to keep flood maps up-to-date has also caused problems for the program. See RAWLE O. KING, CONG. RESEARCH SERV., NATIONAL FLOOD INSURANCE PROGRAM: BACKGROUND, CHALLENGES, AND FINANCIAL STATUS 12–13 (2011) (“FEMA has been criticized by community officials and property owners with respect to flood-control infrastructure protection and its risk mapping process.”); GOV’T ACCOUNTABILITY OFFICE, FLOOD INSURANCE: FEMA’S RATE-SETTING PROCESS WARRANTS ATTENTION, GAO-09-12, at 3 (2008) (“[T]he data that FEMA uses to define flood probabilities are outdated or inaccurate.”).

27. The NFIP does require local communities to adopt building code standards to reduce

surrounding floods to address the perceived symbolic importance of reconstruction. Indeed, the program's practice of paying out repeated claims by the same policyholder²⁸ enables and even encourages the kind of constant reconstruction called for by the symbolism attached to natural disasters and the human responses they engender.

The import of this Article is that the multifaceted, systematic problems facing disaster policy require multifaceted, systematic reform. This resonates with calls by other scholars for radical rethinking of how society interacts with natural hazards. These suggestions often seem self-evident in theory, if unthinkable in practice.²⁹ Lisa Grow Sun, for example, has suggested that communities should carefully consider rebuilding in hazard-prone locations following disaster.³⁰ While the wisdom of this call for introspection may be gaining some traction,³¹ it has rarely carried the day. Even as erosion has battered the highway connecting the Outer Banks of North Carolina, requiring almost \$100 million in repairs since 1983, local leaders vehemently oppose any proposal to remove the road as "unscientific" and "portend[ing] financial disaster."³² This refusal to react to natural conditions by relocating has long been true of human societies. Between the twelfth century and the nineteenth century, only forty-two cities worldwide were permanently abandoned following catastrophe.³³ Today, reconstruction in the wake of disaster is virtually assured.

the damage caused by flooding but enforcement of these standards remains with the local governments. In at least some communities, local government officials have failed to enforce, or even understand these standards, resulting in considerable property loss. See Burby, *Paradoxes*, *supra* note 22, at 178–79.

28. See PIDOT, *supra* note 18, at 15.

29. Even seemingly improbable ideas have gained traction in certain areas beset by natural hazards. So, for example, the President of the Maldives Islands has discussed the possibility of purchasing land in Australia to relocate the Maldivian population as the climate-related sea level rise causes the nation to disappear. See Ben Doherty, *Climate Change Castaways Consider Move to Australia*, SYDNEY MORNING HERALD, Jan. 7, 2012, at Section "News & Features."

30. Lisa Grow Sun, *Smart Growth in Dumb Places: Sustainability, Disaster, and the Future of the American City*, 2011 BYU L. REV. 2157 [hereinafter Sun, *Smart Growth*].

31. See, e.g., Kirk Semple, *A Dilemma, A Promise, A Voice: After the Storm: On Flood Plain, Pondering Wisdom of Rebuilding Anew*, N.Y. TIMES, Sept. 5, 2011, at A13.

32. See Cornelia Dean, *A Lifeline Built on Shifting Sands*, N.Y. TIMES, Mar. 6, 2012, at D1 (quoting a statement by NC-20, an organization of public officials and businesspeople from twenty waterfront counties).

33. Quarantelli et al., *supra* note 6, at 21. This number reflects the abandonment of cities following both natural- and human-caused disasters. *Id.* Relocation following natural disaster, then, is rarer still.

Even before storms strike, local governments face stiff opposition to sensible regulation. Efforts to restrict development on land subject to flooding every *ten years*,³⁴ or simply to require sellers to notify potential buyers that property lies within a twenty-five-year floodplain, consistently face stiff and often successful opposition.³⁵ To explain this phenomenon that places increasing numbers of people and development dollars in harm's way, this Article proceeds in three parts.

Part II examines symbolic obstacles to disaster policy that arise out of language and metaphor. Natural disasters are often viewed through the lens of a conflict in which nature is the aggressor and humans are the victim. This metaphor is appealingly colorful and resonates with significant public concern about terrorism and war. And natural disaster and armed conflict share similarities in terms of the devastation they can cause and the social resources needed in their immediate aftermath. But the metaphor of armed conflict burdens natural disaster response with symbolic baggage. If natural disaster represents attack, failure to rebuild represents capitulation and retreat. In the context of terrorism and war, it may make sense to demonstrate that America remains steadfast, and rebuilding that which has been destroyed serves as a symbolic victory over a sometimes-elusive enemy. Placing people and infrastructure in the path of natural disasters should not be viewed as a similar victory.

The cultural impetus to rebuild arising out of the armed conflict metaphor reinforces innate cognitive processes, addressed in Part III, which cause the human brain to systematically misperceive natural hazard risks. Cognitive psychology has identified mechanisms that result in erroneous risk perception, and these mechanisms, often referred to as heuristics, cause special problems with regard to low-frequency, high-severity risks. High-salience risks, such as the risk of terrorist attack, tend to be magnified, but other risks, and natural risks in particular, tend to be downplayed. As the result of a combination of cognitive processes, natural hazards may be acutely underappreciated. This operates directly on policymakers by shaping their perceptions both of appropriate policies and also the relative importance of different problems. Even where policymakers acquire sufficient information to develop a relatively sophisticated sense of

34. *County Delays Wetlands Changes*, FLA. TODAY, June 3, 2010, at B1.

35. Brian Haas, *New Homes Plan Passes*, BRADENTON HERALD, Aug. 9, 2002, at C1.

the problems posed by natural hazards in their jurisdiction, these cognitive obstacles may shape the public appetite for restrictions on development.

Symbolic and cognitive obstacles impede the development of sensible disaster policy, and so too does the structure of the political institutions charged with that policymaking. It is to these structural obstacles that Part IV turns. Disaster policy is dispersed through all levels of government and across landscapes. This diffusion causes perverse incentives favoring development because governments with primary responsibility to regulate the practices that lead to vulnerability pay few of the costs associated with disaster and capture few of the benefits of effective regulation. These vertical problems—whereby the federal government pays the cost of disaster but local governments reap the rewards of development—and horizontal problems—whereby the policies of neighboring local governments affect each other—favor development over regulation. In addition, the temporal dimensions of disasters and the relationship between their dispersed costs and the concentrated benefits of development lead to regulatory failures.

To make these categories concrete, this Article will discuss the experience of a range of communities in states from Florida to California to Vermont. To illuminate the commonalities of these examples, the Article will primarily, although not exclusively, focus on flooding. Each type of natural hazard poses its own unique variations on the themes discussed. For example, buildings located in floodplains both sustain damage in floods and also increase flood risk by substituting impermeable surfaces for naturally absorbent ecosystems. The severity of other natural events, like earthquakes, may be less sensitive to development. The federal government also plays a slightly larger role in regulating flooding because it provides flood insurance through the NFIP and requires local governments to impose certain land-use controls in identified floodplains.³⁶ Despite differences at the margin, the impediments to sound disaster policy are largely cross-cutting.

A few months after Irene's passage, newspaperman Steven Pappas wrote a story envisioning an optimistic future in which "the

36. See FEMA, NATIONAL FLOOD INSURANCE PROGRAM COMMUNITY ENROLLMENT AND ELIGIBILITY HANDBOOK ENR-3 (2011), available at http://www.floods.org/ace-files/documentlibrary/State_Local%20Resources%20and%20Tools/3.4_FEMA_553_EligibilityHandbook_01-2011.pdf.

evidence” of Hurricane Irene “is hard to find.”³⁷ But the author suggested that Vermont would do more than simply rebuild.³⁸ The future would include “more intelligent river management,” infrastructure “built to higher standards,” and buildings relocated “beyond Irene’s highest flood-waters.”³⁹ These are the right lessons to draw from an experience like Hurricane Irene. They are important lessons, particularly in light of the potential for climate change to increase the number and severity of extreme weather events.⁴⁰ Moreover, they are vital lessons because of the disproportionate effect natural disasters have on vulnerable populations.⁴¹

Considering and responding to the obstacles to disaster policy can facilitate a new paradigm that puts these lessons into practice. In so doing, we must remain cognizant of the lives disaster policy will inevitably impact, particularly the lives of displaced individuals.⁴² A new paradigm may require relocation of entire communities, and this is a transition that society should facilitate, just as it has facilitated development in harm’s way. However, a new paradigm is

37. Steven M. Pappas, *A Cultural Shift*, RUTLAND HERALD, Dec. 20, 2011.

38. *Id.*

39. *Id.*

40. See Sebastián Albuja & Isabel Cavellier Adarve, *Protecting People Displaced by Disasters in the Context of Climate Change: Challenges from a Mixed Conflict/Disaster Context*, 24 TUL. ENVTL. L.J. 239, 239 (2011) (“Climate science has provided unchallenged evidence that climate change has enhanced and will continue to enhance the frequency and intensity of natural hazards.”); Kunreuther & Michel-Kerjan, *supra* note 18, at 1807 (“One of the expected effects of global warming is an increase in hurricane intensity.”); P.J. Webster et al., *Changes in Tropical Cyclone Number, Duration, and Intensity in a Warming Environment*, 309 SCIENCE 1844 (2005) (arguing that there is a trend of increased hurricane activity since 1970). *But see* Jonny C.L. Chan, Letter to the Editor, *Comment on “Changes in Tropical Cyclones Number, Duration, and Intensity in a Warming Environment,”* 311 SCIENCE 1713, 1713 (2006) (arguing that there is no demonstrated trend of increasing hurricane activity correlated with climate change).

41. See, e.g., Daniel A. Farber, *Disaster Law and Inequality*, 25 LAW & INEQ. 297, 301 (2007) (“Disaster may rain down on all, but it only sprinkles on some, while pouring on others.”); Richard J. Lazarus, *Environmental Law After Katrina: Reforming Environmental Law by Reforming Environmental Lawmaking*, 81 TUL. L. REV. 1019, 1027 (2007) (explaining that development in hazard-prone areas is often used “as homes for the poor, the elderly, and racial minorities who lack the economic, physical, and political resources necessary for effective evacuation when catastrophe hits”). Those with the fewest resources not only disproportionately live in harm’s way, but those same communities “remain left out of the recovery and rebuilding effort.” Jonathan P. Hooks & Trisha B. Miller, *The Continuing Storm: How Disaster Recovery Excludes Those Most in Need*, 43 CAL. W. L. REV. 21, 23 (2006).

42. See Albuja & Adarve, *supra* note 40, at 241 (arguing that disaster relief policy “should be guided by human rights standards”); *see also id.* at 243–44 (citing a UN Report that identified a human rights obligation to prevent and mitigate “the effects of disasters”).

needed because we can no longer afford to simply build and rebuild in a continuing cycle of destruction.

II. SYMBOLIC OBSTACLES

The language used to describe natural disasters shapes cultural understanding of those events and affects response. Take this remark Vermont Governor Peter Shumlin made after he travelled the state taking stock of the damage from Hurricane Irene: "I kind of felt like I was coming out of a war zone."⁴³ Or this description of New York City in the aftermath of Superstorm Sandy by Mayor Michael Bloomberg: "To describe it as looking like pictures we have seen at the end of World War II is not overstating it."⁴⁴ Describing the sites of natural disasters as war zones is commonplace,⁴⁵ and this imagery taps into a prevailing cultural framework that posits natural disaster as an armed assault by nature on society. Couching disaster in these terms infuses disaster response with powerful symbolism. Rebuilding in the wake of disaster becomes an imperative. To do otherwise would be to concede defeat.⁴⁶

There are obvious similarities between war and natural disaster—conditions in Vermont following Hurricane Irene did resemble those found in a war zone.⁴⁷ Flooding had caused widespread damage to public infrastructure, houses, and businesses.⁴⁸ The governor and other government officials toured the state by helicopter because travel over land was impossible in

43. Terri Hallenbeck, *The Chief Cheerleader*, BURLINGTON FREE PRESS, Dec. 27, 2011, at 1A.

44. James Barron, *After the Devastation, a Daunting Recovery*, N.Y. TIMES, (Oct. 30, 2012) http://www.nytimes.com/2012/10/31/us/hurricane-sandy-barrels-region-leaving-battered-path.html?pagewanted=all&_r=0; see also Irving Dejohn, *Stormy Year: Hurricane Sandy was the Boro's Top Story in 2012*, DAILY NEWS (New York), Dec. 27, 2012, at 33 ("Superstorm Sandy swept through the city on October 29, with parts of southern Queens resembling post-apocalyptic war zones for the weeks that followed.").

45. See, e.g., Calvin Adkins, *Town Un-Common*, DAILY SOUTHERNER (Tarboro, N.C.), Aug. 31, 2011, available at <http://dailysoutherner.com/x803539061/TOWN-UN-COMMON> (stating that the site of the hurricane "looked like a war zone"); *Deadly Joplin Tornado Was One Year Ago*, MILWAUKEE J. SENTINEL, May 22, 2012, at C8 (describing site of Tornado as "a bombed-out city in a war zone"); Ron Scherer, *After the Snowstorm: Power Outages Mean No Heat, No Trick-or-Treating*, CHRISTIAN SCI. MONITOR, Oct. 31, 2011 (stating that site of blizzard "resembles a war zone").

46. Although the armed conflict paradigm dominates discourse about disaster, natural disasters directly affect many more people each year. See Mauch, *supra* note 13, at 2 (citing UN statistics).

47. See Hallenbeck, *supra* note 43.

48. *Id.*

some areas, and thousands of members of the National Guard, dressed in camouflage and operating military vehicles, descended on the state to aid with response.⁴⁹

However, only certain aspects of natural disasters resemble war. Nature does not attack strategically or with malice like human foes, and responsibility for the damage caused by natural events lies in no small part with individuals that build in areas subject to natural hazards and the policymakers that facilitate this activity.⁵⁰ This section, therefore, explores the ways that reliance on the metaphor of war may trigger a maladaptive response to natural disaster.

Metaphor plays an important part in framing social understanding of events that transpire in the world and can play a particularly important role in shaping popular understanding of difficult-to-conceptualize scientific concepts.⁵¹ The philosopher Kenneth Burke defines metaphor as “a device for seeing something in terms of something else.”⁵² Metaphor, then, enables transference of understanding and insight from one conceptual arena to another, but at the same time, metaphor can lead to distortion. In the context of natural disaster, the metaphor of armed conflict holds powerful allure because of the social resonance of war and because the metaphor accords with cultural mythology that identifies nature as the perpetrator when natural disaster occurs. Seen through the lens of war, domestic natural disasters become an attack on the American homeland. It is no coincidence, perhaps, that the Federal Emergency Management Agency, charged with managing the federal response to natural disasters, is housed within the Department of Homeland Security.⁵³

49. *Id.*

50. As Professor Richard Lazarus put it, “Mother Nature is not humankind’s enemy. Nor is Mother Nature invariably our friend. . . . Mother Nature simply ‘is.’” Lazarus, *supra* note 41, at 1021.

51. Kathleen Tierney et al., *Metaphors Matter: Disaster Myths, Media Frames, and Their Consequences in Hurricane Katrina*, 604 ANNALS AM. ACAD. POL. & SOC. SCI. 57, 74-76 (2006); Esa Valiveronen, *Biodiversity and the Power of Metaphor in Environmental Discourse*, 11 SCI. STUDIES 19, 19 (1998).

52. KENNETH BURKE, ON SYMBOLS AND SOCIETY 247 (1989).

53. DEP’T OF HOMELAND SEC., OFFICE OF THE INSPECTOR GEN., OIG-09-25, FEMA: IN OR OUT?, 6-7 (2009). Donald Kettl has insightfully examined the merging of FEMA into the Department of Homeland Security explaining that reorganizing the federal bureaucracy in the wake of Hurricane Katrina gave politicians the chance to “declare victory as soon as the ink of the president’s signature is dry.” Donald F. Kettl, *Is the Worst Yet to Come?*, 604 ANNALS AM.

I am not the first to suggest that language and mythology shape perceptions of disaster policy. Frederick Bates and Walter Peacock have argued, for example, that using the single term “disaster” to describe tragic events across multiple scales—personal, familial, neighborhood-level, and societal—confuses analysis and understanding of these phenomena, which often have little in common other than the human suffering involved.⁵⁴ By extension, Bates and Peacock’s analysis may suggest that identifying natural events, terrorist attacks, and large-scale accidents as “disasters,” as is commonly done,⁵⁵ may imply a false equivalency between the causes of these events.

Lisa Grow Sun has examined the effect that mythology about natural disaster has on short-term government response.⁵⁶ Professor Sun’s analysis focuses on a commonly held belief that disaster breeds civil disorder, and she argues that media outlets play a central role in perpetuating that belief even in the face of contrary evidence.⁵⁷ As she explains, this error in understanding the natural disaster narrative has “important implications for disaster law and policy,” leading government to overemphasize law enforcement at the expense of humanitarian efforts.⁵⁸ This Article’s aim is to examine a related aspect of modern understandings of natural disaster that—either explicitly or implicitly—cast disaster as a conflict between

ACAD. POL. & SOC. SCI. 273, 278 (2006).

54. See Frederick L. Bates & Walter G. Peacock, *Disaster and Social Change*, in *SOCIOLOGY OF DISASTERS: CONTRIBUTION OF SOCIOLOGY TO DISASTER RESEARCH* 291, 291–92 (Russell R. Dynes et al. eds., 1987).

55. See, e.g., THE NATIONAL ACADEMIES, *supra* note 17, at 1; Kettl, *supra* note 53, at 276 (“Why did [we] fail to learn from September 11—and why are we likely to fail to learn yet again from Katrina?”). At one time, scholars of disaster suggested distinguishing between natural disasters and technological disasters but the distinction has not gained traction. See Quarantelli et al., *supra* note 6, at 22. Grouping “disasters” intentionally caused by human agents with those resulting from natural events reinforces the armed conflict metaphor. In the rubric of disaster, terrorism and hurricane are equivalent. The intuition that society should respond to each in similar fashion is an unintended consequence of this equivalency.

56. Lisa Grow Sun, *Disaster Mythology and the Law*, 96 CORNELL L. REV. 1131 (2011) [hereinafter Sun, *Disaster Mythology*].

57. *Id.* at 1135–36.

58. *Id.* In related work, Professor Sun and Professor RonNell Anderson Jones examine the way that blending discourse about natural disasters with that related to war and terrorism results in government policies and practices that restrict the flow of information and limit transparency. See Lisa Grow Sun & RonNell Anderson Jones, *Disaggregating Disasters*, UCLA L. REV. at 2 (forthcoming).

humans and nature in which nature is inevitably viewed as the aggressor.

The metaphor of natural disaster as conflict resonates with significant cultural history. The story of the great flood, for example, features prominently in many religions. In the Judeo-Christian tradition, the flood constitutes a manifestation of divine will sent to scour the world of sin.⁵⁹ Importantly, historical views on natural disasters equivocated as to whether they were agents of good or evil. Take for example, alternate explanations of earthquakes in fifteenth-century Egypt. Prominent Islamic intellectuals of the time recognized two possible explanations for earthquakes. At times, earthquakes, just as the great flood of the Bible, were viewed as a divine act necessary to punish a sinful world.⁶⁰ At other times, earthquakes were attributed to evil.⁶¹ According to belief, the world balanced on a large fish.⁶² The devil would, on occasion, flatter the fish and it would swell up with pride, shaking the world.⁶³ God would calm the fish, restoring order.⁶⁴ Parallel understandings of natural disaster have long been a feature of the Judeo-Christian tradition, including a view of natural disaster generally as divine retribution or the work of infernal forces.⁶⁵

Natural disasters continue to be described in language that hearkens back to this religious history. For example, the phrase “act of God” is routinely used in the law to describe natural disaster.⁶⁶

59. See, e.g., Russell R. Dynes, *Noah and Disaster Planning: The Cultural Significance of the Flood Story*, 11 J. CONTINGENCIES & CRISIS MGMT. 170, 171 (2003).

60. Anna Akasoy, *Islamic Attitudes to Disasters in the Middle Ages: A Comparison of Earthquakes and Plagues*, 10 MEDIEVAL HIST. J. 387, 392 (2007).

61. *Id.* at 390–91.

62. *Id.*

63. *Id.*

64. *Id.*

65. See, e.g., David K. Chester & Angus M. Duncan, *Responding to Disasters Within the Christian Tradition, With Reference to Volcanic Eruptions and Earthquakes*, 40 RELIGION 85, 86–87 (2010).

66. See, e.g., 42 U.S.C. § 9607(b)(1) (2006) (Comprehensive Environmental Response, Compensation, and Liability Act); 33 U.S.C. § 1321 (2006) (Clean Water Act); 15 U.S.C. § 1693h (Consumer Credit Protection Act); 19 U.S.C. § 1315 (2006) (Tariff Act of 1930). Reinforcing the connection between divine interpretations of natural disasters and armed conflict, federal statutes often address acts of God and acts of war together. See, e.g., 16 U.S.C. § 1911-1 (2006) (limiting liability of individuals damaging national parks where the damage “was caused solely by an act of God or an act of war”); 33 U.S.C. § 2702 (2006) (limiting oil-pollution liability if caused by an act of God or an act of war).

Despite the reference to God, however, secular understandings of natural disaster dominate the contemporary discourse in the United States. As Ted Steinberg has richly detailed, by the end of the nineteenth century, religious understandings of natural disasters had fallen out of favor with the nation's elite, in no small part because such a perspective was viewed as undermining economic recovery.⁶⁷ Steinberg suggests that natural disasters were rewritten, drained of moral meaning, and dressed up in the clothing of nature, rather than supernatural forces.⁶⁸ But this transformation did not fully embrace scientific conceptions of natural events. Rather, powerful economic and social forces mobilized to downplay the importance of disasters, including dishonest reporters influenced by financiers with stakes in perpetuating booming development downplaying the effects of natural hazards.⁶⁹ Following the 1906 San Francisco earthquake, for example, reporters recast the event as an out-of-control fire, transforming a disaster arising out of the geological setting of the city into one that could occur anywhere.⁷⁰ Similar efforts to deemphasize natural disaster followed the 1926 hurricane that struck Miami. The editor of the Miami Herald purportedly directed his staff to divide damage assessments by ten in their reporting to minimize concern about the dangers of living in the hurricane-prone city.⁷¹ Steinberg describes these efforts and many more as the "politics of forgetfulness," whereby economic and political leaders systematically attempted to distract from natural disaster to facilitate development in hazard-prone areas.⁷²

Steinberg captures a sensibility that dominated much of the twentieth century. Projecting safety and calm in the wake of disaster allowed cities to continue with rapid development, and, indeed, the desire to minimize the effects of disaster was so great that cities would turn down offers of financial assistance.⁷³ Recent decades, however, have witnessed a return to sensationalized accounts of

67. See TED STEINBERG, *ACTS OF GOD* 5–22 (2000) (compiling historical documents related to the Charleston earthquake of 1886 to demonstrate shift from religious to secular view of disaster).

68. See *id.* at 4.

69. See *id.* at 33–46.

70. See *id.*

71. See *id.* at 55.

72. See *id.* at 201.

73. See *id.* at 58–59 (turning down assistance from the Red Cross).

natural disasters,⁷⁴ perhaps as a result of increasingly available information, which has made concealing natural hazards difficult,⁷⁵ and a belief that the federal treasury provides a seemingly inexhaustible supply of recovery dollars.⁷⁶

The contemporary incarnation of the disaster narrative continues to be predominantly secular.⁷⁷ That is not to say that the religious narrative has died out altogether. A 2011 survey conducted by the Public Religion Research Institute found that a significant minority of Americans believe that natural disasters are of divine origin.⁷⁸ The majority of Americans, however, view disasters as natural events.⁷⁹

74. See, e.g., *supra* note 45.

75. Cf. LAWRENCE LESSIG, *THE FUTURE OF IDEAS* 10 (2001) (Discussing the potential of the Internet to enhance human interaction and information sharing). As David Ropeik noted in the wake of Superstorm Sandy, “[E]ven if you can avoid the traditional news, it’s hard to escape the social ‘news’ from the virtual world to which we are so connected. The flood of tweets and Facebook posts about the storm further magnified the fear.” David Ropeik, *Superstorm Sandy Reminds Us Why It’s Easy to Underestimate Danger*, WASH. POST (Nov. 2, 2012), http://articles.washingtonpost.com/2012-11-02/opinions/35503963_1_natural-disasters-generators-chris-christie.

76. See David A. Moss, *Courting Disaster? The Transformation of Federal Disaster Policy Since 1803*, in *THE FINANCING OF CATASTROPHE RISK* 307, 309–10 (Kenneth A. Froot, ed., 1999); see also *id.* at 318 (describing “disaster relief” as looking “very much like an entitlement”). The federal government’s extensive expenditures on disaster relief likely fuel this belief. Between 2004 and 2011, the federal disaster relief fund, through which the Federal Emergency Management Administration provides recovery assistance to state and local governments, spent an average of approximately \$10 billion a year. See U.S. GOV’T ACCOUNTABILITY OFFICE, *FEDERAL DISASTER ASSISTANCE: IMPROVED CRITERIA NEEDED TO ASSESS A JURISDICTION’S CAPABILITY TO RESPOND AND RECOVER ON ITS OWN* 2, 14 (2012), available at <http://gao.gov/assets/650/648162.pdf>.

77. The transformation from divine to scientific understandings of disaster is often traced to the Lisbon earthquake of 1755. See FARBER, ET AL, *supra* note 12, at 1; David K. Chester & Angus M. Duncan, *Responding to Disasters Within the Christian Tradition with Reference to Volcanic Eruptions and Earthquakes*, 40 RELIGION 85, 86 (2010). See generally John R. Mullin, *The Reconstruction of Lisbon Following the Earthquake of 1755: A Study in Despotic Planning*, 7 PLANNING PERSPECTIVES 157 (1992) (discussing the earthquake and the reconstruction of Lisbon). As Chester and Angus note, in many modern societies, including in the United States, religious and scientific narratives often coexist. See Chester & Duncan, *supra*, at 89–90.

78. *Few Americans See Earthquakes, Floods, and Other Natural Disasters a Sign from God*, PUB. RELIGION RES. INST. (Mar. 24, 2011), <http://publicreligion.org/research/2011/03/few-americans-see-earthquakes-floods-and-other-natural-disasters-a-sign-from-god-2/>. Religious leaders have also largely embraced understandings of disasters that find human activities significantly culpable for loss. A 2000 study of Christian clergy in South Carolina reported similar results, including, strikingly, that more than seventy-five percent of clergy indicated that most humans have a significant ability to prevent losses in the face of natural disasters. See Jerry T. Mitchell, *The Hazards of One’s Faith: Hazard Perceptions of South Carolina Christian Clergy*, 2 ENVTL. HAZARDS 25, 34 (2000).

79. Dispute over ascribing natural disaster to divine source broke out in the government of Arkansas in 1997, with Governor and Baptist minister Mike Huckabee declaring that he

Nonetheless, disasters are often described as “acts of nature” rather than occurrences, according agency to natural forces and maintaining the sense, even if not specifically voiced, that nature and humans are involved in a conflict in which nature is an enemy that must be resisted.

This cultural approach to disaster is reflected in and reinforced by the mass media’s approach to natural disaster, which relies routinely on the metaphor of armed conflict as a source of evocative language and catchy headlines.⁸⁰ Powerful storms “assault” and “attack.”⁸¹ Nature acts with violence,⁸² terrorizing,⁸³ and wreaking havoc on the human world,⁸⁴ leaving in its wake areas resembling a “post-apocalyptic warzone”⁸⁵ or “looking like they ha[ve] been hit by a bomb.”⁸⁶ In the wake of Hurricane Katrina, New Orleans was consistently described by on-the-ground observers as a “war zone.”⁸⁷ In this war metaphor, nature is personified and made the enemy.

would not sign a disaster-assistance bill if it described tornadoes as “acts of God.” See Mitchell, *supra* note 78, at 25.

80. Quarantelli, *supra* note 6, at 31 (explaining that “the mass communication system is by far the major source of ‘information’ about a disaster or a crisis” and that “[i]n major ways, it socially constructs disasters and crises”).

81. Seth Borenstein, et al., *Powerful Andrew Launches Assault on Louisiana’s Coast*, SOUTH FLORIDA SUN-SENTINEL, Aug. 26, 1992, at A1; Cain Burdeau & Michael Kunzelman, *Gulf Coast Takes Beating from Slow-Moving Isaac*, DENVER POST, Aug. 30, 2012, at 19A; Dennis Cauchon, et al., *Big Deals of 13: Problems We Welcome and Those We’d Rather Leave Behind*, USA TODAY, Dec. 31, 2012, at 1A; Joshua Schneyer & Selam Gebrekidan, *Insight: Sandy Gives New York Oil Supply Lesson*, REUTERS, Nov. 27, 2012; Kelly Yamanouchi, *Gas Prices; Storm Plays Role as Fuel Costs Rise*, ATLANTA JOURNAL-CONSTITUTION, Aug. 30, 2012, at 1A.

82. See Linda Barron, *Together Through Any Storm*, BEAUREGARD DAILY NEWS, Jun. 16, 2012, at 1; Mark Williams, *Utilities No Match for Hurricanes*, PRESS-REGISTER, Jan. 7, 2009, at F3.

83. C. Clark Hubbard, *The New Year*, SAVANNAH MORNING NEWS, Dec. 20, 2012; *Hurricane Andrew, A ‘Modern-Day Apocalypse’*, SOUTH FLA. SUN-SENTINEL (1992), <http://www.sun-sentinel.com/news/local/southflorida/sfl-1992-hurricane,0,7825579.story> (last visited Sept. 11, 2012); Beth Kassab, *Any Economic Bump Could Be Blown Away*, ORLANDO SENTINEL, Aug. 19, 2008, at C1; Anthony R. Wood, *Weather or Not: A History-Making Hurricane Year (Yes, This One)*, PHILA. INQUIRER, Sept. 10, 2007, at D1.

84. *Andrew Wreaks Havoc in S. Florida; Cost in Billions*, S. FLA. SUN-SENTINEL, Aug 25, 1992, at A1; James Quirk, et al., *Flood Victims Fed Up*, N.J. RECORD, Oct. 9, 2011, at A1.

85. *Action News at 11* (ABC television broadcast Dec. 1, 2011), 2011 WLNR 25025533.

86. *Hurricane Andrew (1992)*, S. FLA. SUN-SENTINEL (1992), [http://www.sun-sentinel.com/topic/disasters-accidents/meteorological-disasters/hurricanes/hurricane-andrew-\(1992\)-EVHST000062.topic](http://www.sun-sentinel.com/topic/disasters-accidents/meteorological-disasters/hurricanes/hurricane-andrew-(1992)-EVHST000062.topic) (last visited Jan. 22, 2013).

87. See Tierney, *supra* note 51, at 71. The war-zone is a common metaphor for the site of natural disaster. See *supra* notes 43–44 and accompanying text.

Thus, the damage done to human development by natural events is an expression of nature's "fury" or "capricious wrath."⁸⁸

Similar narratives of the almost-intelligent malevolence of nature play themselves out in popular culture, particularly through disaster movies like *Dante's Peak*, *Twister*, and *The Day After Tomorrow*. Indeed, the history of the disaster-film genre suggests that the narrative parallels it exhibits with war movies are hardly coincidental, but rather, depiction of human versus nature grew up as "a generic surrogate for war films" at a time when public popularity of imagery associated with the Vietnam War declined.⁸⁹

The narrative of armed conflict has become even more resonant in the wake of the 9/11 terrorist attacks. Indeed, 9/11 has become something of a benchmark against which other disasters are measured. Consider, for example, a column by New York Times columnist Paul Krugman explaining that "the failed response to Katrina shows that we are less ready to cope with a terrorist attack today than we were four years ago."⁹⁰ Or this, by columnist Frank Rich:

[W]e cannot allow ourselves to forget the real history surrounding 9/11; it is the Rosetta stone for what is happening now. If we are to pull ourselves out of the disasters of Katrina and Iraq alike, we must live in the real world, not the fantasyland of the administration's faith-based propaganda.⁹¹

88. See, e.g., Steve Alexander, *Simulating Nature's Wrath, When It Comes to Calculating Disasters, Computer Simulations Aim to Measure the "Possible Risk of Ruin"*, STAR TRIBUNE, Jul. 8, 2012, at D3; Joe Bastardi, *Natural Cycles Trigger Extremes*, USA TODAY, Aug. 1, 2012, at A6; Heather Lake, *Preparing for the Worst: Windham Eyes Emergency Micro-Grid Program*, CHRONICLE (Williamatic, Conn.), May 21, 2012, at 1.

89. Mauch, *supra* note 13, at 2.

90. Paul Krugman, *Killed by Contempt*, N.Y. TIMES, Sept. 5, 2005, at A21. To give Krugman his due, after setting up an equivalency between 9/11 and Hurricane Katrina, Krugman does note the crucial difference, stating that "disasters must be coped with, even if they aren't caused by evildoers. Now we have another deadly lesson in why we need an effective government, and why dedicated public servants deserve our respect. Will we listen?" *Id.*

91. Frank Rich, *Falluja Floods the Superdome*, N.Y. TIMES, Sept. 4, 2005, Section 4 at 10; see also Jamie Doward, et al., *Aftermath of the Hurricane: America's Ordeal*, OBSERVER (London), Sept. 4, 2005, at 15 ("[T]he disaster in New Orleans coming a week ahead of the fourth anniversary of 9/11, has a far wider national meaning than simply the Katrina catastrophe itself. Crucially it calls into doubt Bush's electoral promise that he was the best candidate to protect the nation from a terrorist attack.").

A newspaper article running in the Chicago Tribune explained that “even if the death toll from Katrina exceeds the roughly 3,000 fatalities from the 9/11 attacks, the obvious difference, initially, was how frightening and ominous 9/11 felt from border to border and coast to coast.”⁹² Alternatively, consider this article in the New York Times describing sympathy expressed by those who lost a loved one in 9/11 for the victims of Hurricane Katrina:

There is suffering, and there is suffering. There is private pain, and then there is the sort of pain that suddenly goes public, that is broadcast to the nation It’s a select group. The 9/11 families belong to it, of course, as do those who lost a loved one in the 1995 Oklahoma City bombing. Now the victims of Katrina, too, belong.⁹³

A column in the Savannah Morning News following Superstorm Sandy sums up the sentiment, explaining that “Mother Nature can be a terrorist like no other.”⁹⁴

The power of the conflict imagery has not been lost on advocacy groups. For example, an advertisement advocating for creation of a federal insurance program for wind insurance read: “How do you deal with an enemy that has no government, no money trail and no qualms about killing women and children? The enemy is Mother Nature.”⁹⁵ This advertisement primes associations between natural disaster and armed conflict, evoking events like war and terrorism, with the obvious purpose of triggering a social response of resistance to enemy incursion. Military advertising may further strengthen these associations. National Guard recruitment efforts often mix images of disaster response with images of armed conflict.⁹⁶

92. Eric Zorn, *Katrina Shows We’re Not Ready for Catastrophe*, CHI. TRIB., Sept. 4, 2005, at Metro 1; see also *id.* (“At first, the comparisons some drew between the 9/11 terrorist attacks and the devastation left behind by Hurricane Katrina seemed glib and shallow.”).

93. Alan Feuer, *A Fellowship of Suffering, Ever Expanding*, N.Y. TIMES (Sept. 4, 2005), http://www.nytimes.com/2005/09/04/nyregion/thecity/04cope.html?_r=0 (acknowledging the connection publicly perceived between 9/11 and Hurricane Katrina, saying “the public often says: Don’t forget. Don’t forget the towers falling down. Don’t forget the levees breaking open,” and concludes that “New Orleans, like New York, will rise again”).

94. Hubbard, *supra* note 83.

95. Advertisement, N.Y. TIMES, Aug. 29, 2011, at A11.

96. See, e.g., National Guard, *At This Moment*, YOUTUBE (Nov. 12, 2009),

Political leaders draw on this language too. Consider this statement by the mayor of Atlantic City following Superstorm Sandy: "When Mother Nature sends her wrath your way, we're at her mercy."⁹⁷ Or these statements made by President Barack Obama and Mayor of New Orleans Mitch Landrieu in the hours before Hurricane Isaac made landfall in Louisiana in August 2012. Mayor Landrieu expressed the urgency of the situation by explaining, "We are officially into the fight, and the city of New Orleans is now on the front lines."⁹⁸ However, New Orleans was prepared. "We are battle-ready," reported the Mayor.⁹⁹ President Obama used similar language of conflict to invoke national unity, stating, "[W]hen disaster strikes, we're not Democrats or Republicans first, we are Americans first."¹⁰⁰ Similar rhetoric was used in the wake of Hurricane Katrina. Testifying before the U.S. House of Representatives, Louisiana Governor Kathleen Blanco explicitly invoked feelings of patriotism tied up in armed conflict in discussing Hurricane Katrina: "After World War II our decision to rebuild Europe was farsighted and courageous. History will treat us well if we exhibit the same kind of political courage now."¹⁰¹ And in the wake of Hurricane Andrew, a local government official in Florida posed the question as television cameras rolled: "Where in the hell is the cavalry?"¹⁰²

<http://www.youtube.com/watch?v=AbfPj00pTNY>; 3 Doors Down, *Citizen Soldier*, YOUTUBE (Nov. 23, 2007), <http://www.youtube.com/watch?v=emm4VFvn2Jg>.

97. Jacque Wilson, *Victims Fall to Superstorm's Wrath*, CNN (Nov. 2, 2012), <http://www.cnn.com/2012/10/31/us/superstorm-sandy-victims-profiles/index.html>.

98. John Schwartz & Campbell Robertson, *Hurricane Isaac Makes Landfall Along Gulf Coast*, N.Y. TIMES (Aug. 28, 2012), <http://www.nytimes.com/2012/08/29/us/tropical-storm-isaac-on-verge-of-becoming-a-category-1-hurricane.html?pagewanted=all>.

99. Molly Hennessy-Fiske & David Zucchino, *Nervous Gulf Residents Brace for Gathering Storm*, ORLANDO SENTINEL, Aug. 28, 2012, at A7.

100. Schwartz & Robertson, *supra* note 98. President Obama offered similar comments in the wake of Superstorm Sandy: "[W]hen disaster strikes, we see America at its best." Mary Bruce, *Obama Invokes Superstorm Sandy on the Campaign Trail*, ABC NEWS (Nov. 1, 2012), <http://abcnews.go.com/blogs/politics/2012/11/obama-invokes-superstorm-sandy-on-the-campaign-trail/>.

101. *Hurricane Katrina: Preparedness and Response by the State of Louisiana: Hearing Before the Select Bipartisan Comm. to Investigate the Preparation for and Response to Hurricane Katrina*, 109th Cong. 2 (2005) (statement of Governor Kathleen Blanco).

102. Wayne Washington, *Can FEMA Handle S.C. Hurricane? Candidates Vary on if Agency Should Stay Part of Homeland Security*, COLUMBIA ST. (S.C.), Aug. 26, 2007, at B9. Describing those assisting with disaster response as the cavalry, even if they have no relationship to the military, is not uncommon. See Steffani Nolte, *Progress Energy Crews Restore Power to North Carolina*, FLORENCE MORNING NEWS (S.C.), Aug. 29, 2011.

The metaphor of natural event as attack is reinforced by the fact that the domestic response to natural disaster closely parallels responses to military action. Waiting for the “cavalry” evokes images of battlefields and weary soldiers desperate for reinforcements. Moreover, in the wake of natural disaster, local communities actually await aid from the military. For example, members of the New York National Guard’s 101st Cavalry were activated to assist areas damaged by Superstorm Sandy.¹⁰³ Thus, victims of Superstorm Sandy were, quite literally, waiting for the “cavalry.” The military also has a prominent role in engineering efforts to stave off disaster. The Army Corps of Engineers is primarily charged with construction and maintenance of structural defenses to natural hazards.¹⁰⁴ And emergency management agencies evolved out of civilian defense groups designed to address threats of air raid during times of armed conflict.¹⁰⁵ The vivid image of military convoys rushing to disaster sites only reinforces the sense that we are, indeed, at war with nature.¹⁰⁶

All of this talk of war, assault, and attack perpetuates vulnerability to natural hazards by framing reconstruction as necessary. In the aftermath of 9/11, the phrase “these colors don’t run” became a popular means of communicating America’s resolve.¹⁰⁷ Retaliation and reconstruction were seen as the only available response to the terrorist attacks, else the terrorists would have secured a victory over the American psyche. Natural disasters trigger a similar response, a “knee-jerk reaction . . . to rebuild the same roads and bridges that existed before and bigger, more expensive homes.”¹⁰⁸ Where a foreign agent—be it a foreign power

103. Richard Goldenberg, *N.Y. Mobilizes More than 2,300 Guardsmen to Battle Hurricane Sandy Aftermath*, DEF. DEP’T DOCUMENTS, Oct. 3, 2012. National Guard units from other states were also deployed to respond to Superstorm Sandy. See *National Guard Soldiers Activated for Sandy*, ARMY TIMES (Oct. 29, 2012), <http://www.armytimes.com/news/2012/10/ap-national-guard-activates-750-in-pa-for-sandy-102912/> (noting that Pennsylvania, New York, and Virginia activated more than 3,000 national guard soldiers to respond to Superstorm Sandy).

104. See, e.g., *About Us*, U.S. ARMY CORPS OF ENGINEERS, <http://www.usace.army.mil/About.aspx> (last visited Nov. 1, 2012).

105. Quarantelli et al., *supra* note 6, at 20.

106. See, e.g., Sun, *Disaster Mythology*, *supra* note 56, at 1133 (quoting CNN’s Wolf Blitzer as describing the arrival of National Guard troops in New Orleans following Hurricane Katrina as “eight convoys and troops are on the ground at last in a place being described as a lawless, deadly war zone”).

107. See *Old Glory Gave Comfort to a Wounded Nation, Often Waved in Dissent or Disagreement, It Gave Us Unity After Attacks*, GRAND RAPIDS PRESS (Grand Rapids, Mich.), Sept. 11, 2011, at A16.

108. Kate Spinner, *Girding Nation for Weather Extremes*, SARASOTA HERALD-TRIB. (Sarasota,

or an overly proud fish—causes harm to the homeland, we respond using a militaristic frame in which we must defend ourselves and ultimately defeat the other. Such responses may be appropriate in the case of terrorist attack or armed conflict, but they have no value in the face of hurricanes, tornados, and earthquakes that pay no mind to society's actions.¹⁰⁹ Natural events do not *intend* to cause destruction and terror. Proudly demonstrating a commitment to rebuild in the same hazard-prone locations will not deter future events. The rhetoric of conflict forecloses, or at least renders more difficult, decisions to rebuild in more sensible, safer locations because, in the narrative of armed conflict, such response represents capitulation and retreat.¹¹⁰

III. COGNITIVE OBSTACLES

The symbolic obstacles to reform discussed in the previous Part synergize with aspects of human cognition that systematically skew public perception of disaster risk.¹¹¹ Even when science provides a

Fla.), Jan. 27, 2012, at B1. Notably, that “communities, by and large . . . assume that they will rebuild after disasters is a relatively recent development.” James K. Mitchell, *American Disasters During the Twentieth Century: The Case of New Jersey*, in NATURAL DISASTERS, CULTURAL RESPONSES, *supra* note 12, at 327, 337. In a detailed account of disaster history in New Jersey—a state that we rarely associate with natural disasters—Mitchell explains that numerous small communities along the New Jersey Coast and located in the fire-prone pine barrens have been abandoned. Only in the last few decades have we become so enamored of structural approaches to disaster mitigation that a presumption of reconstruction has arisen. *Id.* at 336–37.

109. Similarly, Professors Sun and Jones explain that restricting information may be appropriate in some circumstances during wartime to prevent thinking enemies from exploiting that information to the detriment of national security. See Sun & Jones, *supra* note 58, at 15. But this justification does not apply to natural disasters. *Id.* at 49.

110. Indeed, discussion of necessary migration of development away from coastlines to reduce vulnerability to hurricanes and rising sea levels is typically phrased in terms of retreat. See, e.g., J. Peter Byrne & Jessica Grannis, *Coastal Retreat Measures*, in THE LAW OF ADAPTATION TO CLIMATE CHANGE 267 (Michael B. Gerrard & Katrina Fischer Kuh eds., 2012). The very concept of “recovery” as generally used today reinforces the notion that in the aftermath of disaster, the only appropriate response is to rebuild. Take for example a relatively technical definition of recovery provided in the sociological literature. Recovery is defined as “a community reaching that point in its social and economic development that it would have reached had no disaster occurred.” Bates & Peacock, *supra* note 54, at 302; see also *id.* at 326 (explaining that most disaster assistance in the United States “has the aim of restoring the system to its former condition”). However, so defining recovery stacks the deck. It means that we can only recover by rebuilding. Recovery, under that definition, does not include decisions not to rebuild but rather to integrate affected communities into others in less hazard-prone areas.

111. This section focuses on the ways that cognition skews perceptions of probabilities that risks will manifest. It does not, therefore, address cognitive processes that favor instant gratification over longer-term benefits. See Lazarus, *supra* note 41, at 1035 (“Human beings naturally discount the temporally and physically distant because of the apparent lack of direct

reasonably certain prediction about the likelihood of disaster, the human brain may unreasonably discount that risk. The perception that reconstruction isn't risky reinforces the intuition that rebuilding is a symbolic necessity. This Part explores cognitive errors that may skew perceptions of natural hazards and thereby directly affect not only policymakers' interest in reducing vulnerability but also the public demand for such action.

In recent decades, psychologists have uncovered numerous ways that cognition leads to seemingly irrational decision making.¹¹² Processes of so-called "bounded rationality" lead to systematic skew in thinking that can have profound implications for law.¹¹³ The human brain has trouble conceptualizing probabilistic events, particularly those with low frequency and high severity.¹¹⁴ This problem becomes extreme as probabilities approach zero. As a form of mental shortcut, in some circumstances the mind perceives very low probabilities as impossibilities. So, for example, scholars investigating insurance markets have suggested that this mental shortcut may account for widespread underinvestment in insurance to protect against very-low-probability events, particularly natural disasters.¹¹⁵ Similarly, viewing low risks as zero risks may lead

relevancy to their own lives."). I do not mean to suggest, however, that public perceptions of risk are unimportant to public policy. Risk perception may be "irrationally" skewed by discounting. *See id.* It may also be more responsive to those effects of disaster that are hard to quantify, such as psychological responses of victims or even those physically unaffected. As Paul Slovic explained, "'riskiness' means more to people than 'expected number of fatalities.'" Paul Slovic, *Perception of Risk*, 236 *SCIENCE* 280, 285 (1987). *But see* Frank B. Cross, *Facts and Values in Risk Assessment*, 59 *RELIABILITY ENGINEERING & SYS. SAFETY* 27, 27 (1998) (arguing that "the public's risk perception is pervasively infected by ignorance or illegitimate value judgments"). Scientific estimates of the probabilities of floods, blizzards, earthquakes and the like are also subject to a degree of social construction because, in most cases, the data require interpretation. *See* Tom Horlick-Jones, *Meaning and Contextualization in Risk Assessment*, 59 *ENGINEERING & SYS. SAFETY* 79, 81 (1998). But in the context of natural disasters at least, predictions about periodicity have a real-world check because, over time, a certain number of disasters will strike any particular area. This Part addresses the cognitive obstacles to accurately comprehending the likelihood of natural disasters.

112. For general treatments of the psychology of bounded rationality, see *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* (Thomas Gilovich et al. eds., 2002); *JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES* (Daniel Kahneman et al. eds., 1982).

113. *See* Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 *STAN. L. REV.* 1471, 1477-78 (1998); *see also* John Conlisk, *Why Bounded Rationality?*, 34 *J. ECON. LITERATURE* 669, 669-70 (1996).

114. *See, e.g.*, Christine Jolls & Cass R. Sunstein, *Debiasing Through Law*, 35 *J. LEGAL STUD.* 199, 208-09 (2006).

115. *See, e.g.*, Kunreuther & Pauly, *supra* note 22, at 11; Howard Kunreuther et al., *Making Low Probabilities Useful*, 23 *J. RISK & UNCERTAINTY* 103 (2001); Paul Slovic et al., *Preference for*

individuals to make economically irrational decisions about where and how to build.

Consider how this cognitive error could affect someone owning property in a five-hundred-year flood plain. Such a risk might be sufficiently low that decisions about development will be made with no thought to flood risk, even if construction is economically marginal and would not be cost justified if the risk of loss were taken into account. This error also may infect government decisions, which are often made with little consideration for low likelihood events. Flood-control dams are rarely built to withstand five-hundred-year flood events and the NFIP does not include any minimum design standards for buildings subject to such risks.¹¹⁶ In some circumstances, of course, these decisions are economically rational based on the risks, but in others, risks may simply be neglected. This is true despite the fact that a flood that occurs on average every 500 years has a one percent chance to occur every five years, and a ten percent chance to occur every fifty years. And such floods have produced significant damage, as the residents of Duluth, Minnesota, discovered in June of 2012, where a five-hundred-year flood caused more than \$100 million in damage.¹¹⁷ Because individuals and policymakers perceive risks likely to actualize an average of once every five hundred years as risk-free, they may overlook cost-justified mitigation efforts.

Other cognitive processes distort perceptions of natural hazards even when they are perceived. These rare events may be subject to two competing cognitive errors that lead to systematic devaluation of risk. The first, the gambler's fallacy, biases estimation of risks in the immediate aftermath of disaster. The gambler's fallacy causes people to believe that an unlikely event that has recently occurred is less

Insuring Against Probable Small Losses: Insurance Implications, 44 J. RISK & INS., 237, 254–55 (1977). But see Susan K. Laury et al., *Insurance Decisions for Low-Probability Losses*, 39 J. RISK & UNCERTAINTY 17 (2009) (presenting data from an experiment indicating that “individuals are more likely to purchase insurance for the higher-consequence, lower-probability events”).

116. See, e.g., Exec. Order No. 11,988, 42 Fed. Reg. 26,951 § 6(b) (May 24, 1977) (defining “base flood” for purposes of NFIP as a “flood which has a one percent or greater chance of occurrence in any given year”); U.S. GEN. ACCOUNTING OFFICE, GAO/RCED-95-125, *MIDWEST FLOOD: INFORMATION ON THE PERFORMANCE, EFFECTS, AND CONTROL OF LEVEES 2-3* (1995) (noting that a “typical” federal flood control levee protects against a “100-year flood,” while non-federal levees often provide lesser protection).

117. See Jennifer Brooks, *Special Session Set for August on Flood Relief*, STAR TRIB. (Minn.) (July 12, 2012), <http://www.startribune.com/politics/statelocal/162147585.html?refer=y>.

likely to recur in the near future.¹¹⁸ The gambler's fallacy is basically the belief that lightning doesn't strike the same place twice.¹¹⁹ The gambler's fallacy, then, leads individuals and government entities to overinvest in reconstruction in the wake of disaster based on a mistaken assumption that a period of repose and relative safety will follow.

Interviews with those struck by multiple disasters bear out the operation of the gambler's fallacy. In upstate New York, a business executive for a company that had built a large commercial facility in a floodplain damaged in Hurricane Irene explained that since flooding had recently occurred, "[w]e thought we had a hundred years."¹²⁰ Similarly, a Louisiana property owner explained his decision to rebuild saying "something like [Hurricane] Katrina happens only once in a hundred years. . . . By that time, I'll be dead."¹²¹ As a Florida resident explained, "I never had a problem. Then came [a hurricane]. Afterward, I said it wouldn't happen twice."¹²² Similarly, in repeated flooding of the Susquehanna River in 2006 and 2011, one local resident explained that he believed the 2006 event had been a "once-in-a-lifetime flood" and another emphasized that "you don't expect it two times in five years."¹²³ This type of thinking can lead people to invest heavily in the wake of disaster.¹²⁴

118. See Stephen P. Stich & Richard E. Nisbett, *Justification and the Psychology of Human Reasoning*, 47 PHIL. SCI. 188, 192–93 (1980) (explaining the gambler's fallacy); see also Tristram McPherson, *Moorean Arguments and Moral Revisionism*, 3 J. ETHICS & SOC. PHIL. 2, 20 (2009) ("Ordinary reasoners display robust endorsement of irrational inference patterns such as the gambler's fallacy.").

119. The idiom fails to even accurately describe the behavior of lightning. See *MythBusters: Lightning Strikes Twice* (Discovery Channel television broadcast Apr. 5, 2011), available at <http://dsc.discovery.com/tv-shows/mythbusters/videos/lightning-strikes-twice-minimyth.htm>.

120. Semple, *supra* note 31.

121. Peter Whoriskey, *New Orleans Repeats Mistakes as it Rebuilds: Many Houses Built in Areas Katrina Flooded Are Not on Raised Foundations*, WASH. POST (Jan. 4, 2007), <http://www.washingtonpost.com/wp-dyn/content/article/2007/01/03/AR2007010301593.html>.

122. Tyler Bridges, *Victims Are Stunned by Ferocity of Storm*, MIAMI HERALD, Oct. 6, 2000, at B2.

123. Sarah Hofius Hall et al., *Flood Victims Recount Their Experiences*, TIMES-TRIBUNE (Scranton, Pa.) (Sept. 10, 2011), <http://thetimes-tribune.com/news/flood-victims-recount-their-experiences-1.1201023>.

124. For example, following 2006 flooding of a post office, a couple purchased the building to live in and invested substantial money and energy in custom design. The home was then destroyed in Hurricane Irene. See Josh Mrozinski, *In Hard-Hit Neighborhoods, Rebuilding Begins*,

The gambler's fallacy depresses estimation of risk in the immediate aftermath of disaster, but as time passes and memories of the aftermath fade, a second cognitive error may kick in and continue to skew risk perceptions.¹²⁵ Specifically, the availability heuristic may replace the gambler's fallacy, leading to a similar result. The availability heuristic leads people to assess the likelihood that something will occur based on the ease with which an example of it comes to mind.¹²⁶ Over time, the experience of disaster will come to mind less easily, leading to assumptions of relative safety and causing people to make decisions as though the natural hazards no longer existed. When disaster strikes again, people express surprise and shock at the ending of a long period of calm.¹²⁷ As an experienced insurance adjuster put it, "Wherever it's been a long time since the last hurricane . . . people become complacent."¹²⁸

Another version of the availability heuristic may also be at work. People typically believe that others make rational decisions, and observing others living and working in hazard-prone areas may lead to assumptions about safety.¹²⁹ In other words, observing others

TIMES-TRIBUNE (Pa.) (Sept. 3, 2011), <http://thetimes-tribune.com/news/in-hard-hit-neighborhoods-rebuilding-begins-1.1197435>.

125. The results of this cognitive error may vary between individuals. For some, the availability heuristic may drown out the gambler's fallacy, particularly where a natural disaster has had unusually powerful affects. Spikes in insurance purchasing in the wake of certain disasters suggest that particularly in the very short term, property owners may have heightened perceptions of risk. For example, between September 30, 2011 and August 31, 2012, the number of NFIP policies purchased in Vermont grew by about sixteen percent. See *National Flood Insurance Program: Total Number of Policies in Force*, FED. EMERGENCY MGMT. AGENCY (Mar. 2012), <http://www.fema.gov/policy-claim-statistics-flood-insurance/policy-claim-statistics-flood-insurance/policy-claim-13-2> (follow "Total Number of Policies in Force" hyperlink) (identifying 3,719 policies in Vermont as of September 30, 2011); *National Flood Insurance Program: Policy Statistics*, FED. EMERGENCY MGMT. AGENCY, <http://bsa.nfipstat.fema.gov/reports/1011.htm> (last visited Jan. 13, 2013) (identifying 4,327 policies in force as of August 31, 2012). As a result, "availability and salience [may] create short-term spikes in demand immediately after a horrific natural disaster, but, as the vividness of the event recedes, the gambler's fallacy kicks in to depress demand for insurance." See PIDOT, *supra* note 18, at 33 n. 123.

126. See Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1477-78 (1998) (explaining the availability heuristic).

127. Hurricane Irene was the worst storm in Vermont since 1927. See Matt Sutkoski, *The Power of Water*, BURLINGTON FREE PRESS, Sept. 4, 2011, at D1. Of course, it should come as no surprise that one-hundred-year flooding occurs twice in the span of ninety years.

128. Susan R.A. Honeyman, *When Uncommon Storms Make a Surprise Visit*, ROUGH NOTES, May 1, 2012, at 66, available at http://www.roughnotes.com/rnmagazine/2012/may2012/2012_05p066.htm.

129. See Timur Kuran & Cass R. Sunstein, *Availability Cascades and Risk Regulation*, 51 STAN.

living and working in hazard-prone areas provides readily available examples that appear to suggest that risks are low. Similarly, people often overestimate the effectiveness of mitigation measures.¹³⁰ Because cognition depends in part on observation of the behavior of others, cognitive errors can compound, causing whole communities to adopt false understandings of disaster risk based on assumptions about the beliefs of others.¹³¹

This dynamic can be particularly strong when public-works projects designed to reduce hazards are involved.¹³² For example, people overestimate the protection afforded by dikes designed to protect against floods, and this is particularly so when others live and work in the shadow of those projects. This hard lesson has been taught repeatedly. The Central Valley of California is a particularly dramatic example. Before the construction of dams, the valley was subject to dramatic flooding.¹³³ After dams were constructed, residential and commercial development swiftly dominated the landscape to such an extent that “new homeowners have little notion that they live in a floodplain.”¹³⁴ But dams can only contain so much water, and in 1997 more than 185 homes were flooded when the Tuolumne River jumped its heavily engineered banks.¹³⁵ Hurricane Katrina also taught the lesson of engineering increasing vulnerability in even more dramatic fashion.¹³⁶

L. REV. 683, 710–12 (1999) (discussing social framing of risk perception).

130. The National Hurricane Center, for example, instructs people not to tape their windows before a hurricane because it “leads to a false sense of security.” Mike Schneider, *Don't Tape Your Windows Before a Hurricane, Officials Say*, VIRGINIAN-PILOT, Mar. 28, 2012, at A3. As David Ropeik aptly described in the Washington Post following Superstorm Sandy, “The more control over a risk you think you have, the less worrisome it feels, no matter how false that sense of control might be.” David Ropeik, *Superstorm Sandy Reminds Us Why It's Easy to Underestimate Danger*, WASH. POST (Nov. 2, 2012), http://articles.washingtonpost.com/2012-11-02/opinions/35503963_1_natural-disasters-generators-chris-christie.

131. See Kuran & Sunstein, *supra* note 129, at 711.

132. Raymond Burby has termed this the “safe development paradox,” whereby efforts to enhance safety result in increased vulnerability to natural hazards. See Burby, *Paradoxes*, *supra* note 22, at 173–78.

133. See DEPARTMENT OF WATER RESOURCES, STATE OF CALIFORNIA, A CALIFORNIA CHALLENGE—FLOODING IN THE CENTRAL VALLEY iii (2007), available at <http://www.water.ca.gov/news/newsreleases/2008/101507challenge.pdf>.

134. See Elliot Diringier & Ramon G. McLeod, *Floods Warn Valley of Worse to Come / Storms, Growth Expose Region's Rising Risk*, S.F. CHRON., Mar. 3, 1997, at A1.

135. *Id.*

136. See AMERICAN SOCIETY OF CIVIL ENGINEERS HURRICANE KATRINA EXTERNAL REVIEW PANEL, THE NEW ORLEANS HURRICANE PROTECTION SYSTEM: WHAT WENT WRONG AND WHY 61–

The cognitive errors this Article has been discussing skew perceptions of risk at both the individual and socio-political level. This occurs because these errors influence policymakers individually and also shape the public's appetite for regulation. Where the electorate believes development is relatively risk free, they are likely to oppose regulation that will increase the cost of development.¹³⁷

Moreover, sophisticated parties can harness cognitive phenomena to advance their political agenda. Timur Kuran and Cass Sunstein have identified "availability entrepreneurs" leveraging cognitive errors in the context of political debates about technological risks.¹³⁸ Kuran and Sunstein identify circumstances where advocates for restrictive policies have highlighted or even invented risks to trigger the availability heuristic.¹³⁹ Similarly, availability entrepreneurs with vested interests in relaxed development policies may emphasize, as part of their advocacy, examples of development in hazard-prone areas that have not experienced catastrophic losses. In so doing, examples of "safe" development may more easily come to mind, causing people to overestimate safety.

In addition to the cognitive phenomena discussed above, the very fact that people perceive natural disasters as natural may lead to an underappreciation of risk. In experimental settings, individuals express a substantially greater degree of concern about artificial risks than natural risks, even when the risks are of the same magnitude.¹⁴⁰ So, people assume they are relatively safe in the face of flood risk, even as they demand swift political action in response to artificial hazardous substances like those detected at Love Canal.¹⁴¹

63 (2007), available at http://www.asce.org/uploadedFiles/Publications/ASCE_News/2009/04_April/ERPreport.pdf (explaining that lack of quantification of risks related to New Orleans hurricane protection system meant that "residents . . . could not have known the actual risks with which they were living"); Burby, *Paradoxes*, *supra* note 22, at 176.

137. As Cass Sunstein has explained, "If citizens believe that they have much to gain and little to lose from risk regulation, they will favor risk regulation; leaders should be expected to respond to what citizens believe, and their own judgments are influenced by an intuitive kind of cost-benefit analysis as well." Cass R. Sunstein, *On the Divergent American Reactions to Terrorism and Climate Change*, 107 COLUM. L. REV. 503, 524 (2007).

138. Kuran & Sunstein, *supra* note 129, at 687-88.

139. *Id.*

140. See W. Kip Viscusi, *Carcinogen Regulation: Risk Characteristics and the Synthetic Risk Bias*, 85 AM. ECON. REV. 50, 53-54 (1995).

141. See Kuran & Sunstein, *supra* note 129, at 697-98.

A final cognitive error that may affect risk perceptions is known as the “affect heuristic,” which causes emotion to influence cognition, and particularly judgments about risk. The operation of the affect heuristic skews risk perception based on emotional attachment.¹⁴² So, for example, people tend to perceive things they like as being low risk and things they don’t like as being high risk.¹⁴³ This may lead to erroneous correlation of risks and benefits, whereby that which is beneficial is perceived as being safe and vice versa.¹⁴⁴ The problem is, of course, that risks and benefits are not always correlated, and this may be particularly true in the context of development. Property subject to high natural hazards may also have amenities that make it particularly attractive for residential or commercial development. For example, ocean front property is both highly desired for its aesthetic attributes and also high risk. The affect heuristic may lead people to discount risks when they have emotional attachment to a particular piece of property. In other words, a potential homebuyer who forms a rapid emotional attachment to a house will be susceptible to overestimating the house’s safety.

The symbolism of reconstruction addressed in Part II may itself activate the affect heuristic. The rhetoric of armed conflict creates social pressure to rebuild as a symbol of resistance and resolve and to avoid the appearance of surrender. Thus, policies favoring swift reconstruction activate positive emotions, while those disfavoring such activities activate negative emotions. Through the affect heuristic, these emotional responses become part of the public perception of natural hazard risk. Redevelopment, then, is not only culturally imperative but is also perceived as a relatively safe decision.

Assessment of redevelopment in the wake of disaster is, therefore, vulnerable to a range of cognitive errors. Coupled with the symbolic factors affecting risk perception, these factors often militate in favor of development even where such development is “irrational” in the market sense that risks outweigh benefits. This does not mean, of course, that all decisions to build in the face of natural

142. See Melissa L. Finucane et al., *The Affect Heuristic in Judgments of Risks and Benefits*, 13 J. BEHAV. DECISION MAKING 2 (2000).

143. See *id.*

144. See *id.* at 13.

hazards are irrational. Indeed, as we shall see in Part IV, the structure of American political institutions separates the costs of disaster from the benefits of development and consequently creates a situation where, from the private landowner's or local government official's perspective, overinvestment in development is often highly advantageous.

IV. STRUCTURAL OBSTACLES

Parts II and III have explained that the cultural and cognitive context of disaster policy is hostile to restrictive development policies. As a result of that context, people invest more heavily in hazard-prone areas than common sense or economic reality supports, and government officials resist regulation. Effective disaster policy also faces obstacles from the very structure of the government institutions charged with its promulgation and effectuation. Some of these problems arise from relationships unique to the American constitutional experience and the principles of federalism it embodies. Others are inherent in the democratic structures of government more generally. These obstacles create substantial incentives for private individuals and government officials to facilitate development in hazard-prone areas.

The first structural obstacle arises from vertical relationships between local, state, and federal governments and their respective responsibilities for natural disaster policy.¹⁴⁵ To understand those relationships, consider Brattleboro, Vermont, a town that lies at the confluence of the West River and the much larger Connecticut River.¹⁴⁶ Based on flood maps prepared in 1977, the town contains approximately 1000 acres in one-hundred-year floodplains.¹⁴⁷ The

145. See, e.g., Ben Depoorter, *Horizontal Political Externalities: The Supply and Demand of Disaster Management*, 56 DUKE L.J. 101, 104 (2006). Dispersal of authority across federal, state, and local governments also has substantial ramifications for rescue efforts, law enforcement, and humanitarian response in the wake of natural disaster. See generally Stephen M. Griffin, *Stop Federalism Before It Kills Again: Reflections on Hurricane Katrina*, 21 ST. JOHN'S J. LEGAL COMMENT. 527 (2006).

146. See *Map of the Town of Brattleboro, VT.*, MAPSONLINE.NET, <http://www.mapsonline.net/battleborovt/> (last visited Oct. 27, 2012).

147. See *Brattleboro, Vermont Town Plan Map Series: Flood Hazard Areas*, BRATTLEBORO.ORG, <http://www.brattleboro.org/vertical/sites/%7BF60A5D5E-AC5C-4F97-891A-615C172A5783%7D/uploads/%7BDC196E51-1FDA-4CD9-B71A-4A4FDFC0F03D%7D.PDF> (last visited Oct. 27, 2012); 1 TOWN OF BRATTLEBORO, BRATTLEBORO TOWN PLAN 121 (2004), available at <http://www.brattleboro.org/vertical/sites/%7BFABA8FB3-EBD9-4E2C-91F9->

Brattleboro zoning laws largely control land use and development within the town, and to a large extent, the town's policies dictate the extent of its vulnerability to flooding.¹⁴⁸ Brattleboro's zoning code generally prohibits construction within stream channels themselves,¹⁴⁹ but allows new development in floodplains so long as minimum building standards are met.¹⁵⁰ These standards, while locally adopted and enforced, largely reflect the minimum standards that the federal government requires for NFIP eligibility.¹⁵¹

This is a pretty typical arrangement. Land-use planning and regulation of property have long been viewed as central functions of local government. That allocation has been consistently endorsed by the Supreme Court and featured in an 1868 Supreme Court decision, *Swift v. Tyson*.¹⁵² *Swift* famously held that federal courts could generally interpret the common law without regard to decisions of state courts.¹⁵³ *Swift* concomitantly held that the federal courts had no independent authority over the "rights and titles to things having a permanent locality, such as the rights and titles to real estate, and other matters immovable and intra-territorial in their nature and character."¹⁵⁴ The commitment to generally—although not absolutely—entrust land-use decisions to state and local governments has persisted. In 2008, a plurality decision of the Supreme Court echoed the views expressed in *Swift*. As Justice Scalia wrote, "[r]egulation of land use . . . is a quintessential state and local power."¹⁵⁵

The federal government tinkers with land-use planning at the margins through the NFIP and laws like the Coastal Zone

C74DE6CECDFD%7D/uploads/Ch_10_Natural_Resources.pdf. Flood maps of this vintage are common but recognized to substantially underestimate risks. See, e.g., *supra* note 26 (discussing the failure of NFIP to maintain up-to-date flood maps).

148. See generally TOWN OF BRATTLEBORO, VT., ZONING ORDINANCE art. III, § 3210 (July 3, 2007).

149. *Id.* § 3257(d).

150. See *id.* § 3255.

151. See FEMA, NATIONAL FLOOD INSURANCE PROGRAM COMMUNITY ENROLLMENT AND ELIGIBILITY HANDBOOK, *supra* note 36.

152. 41 U.S. 1, 8–9 (1842), *overruled by* *Erie R.R. Co. v. Tompkins*, 304 U.S. 64, 79–80 (1938). Even before *Erie* largely ended the project of federal common law, federal courts had already recognized exclusive state control over the law of property, including land use. See *id.* at 18–19.

153. *Id.* at 9–10.

154. *Id.* at 18.

155. *Rapanos v. United States*, 547 U.S. 715, 738 (2006) (plurality opinion).

Management Act and Coastal Barrier Resources Act, which create incentives for local governments to restrict or at least regulate development.¹⁵⁶ On its face, section 404 of the Clean Water Act also appears to have substantial implications for flood risk by requiring parties seeking to fill wetlands to secure permits from the federal government.¹⁵⁷ But regulations that implement the act render this tool ineffective because they require the Army Corps of Engineers to defer to land-use and zoning decisions made by state and local government.¹⁵⁸ The Corps implementation of those regulations has been even more favorable to local views. As Oliver Houck has explained, for example, robust political opposition in Louisiana to any effort to limit wetlands development resulted in a culture at the Corps that automatically approved virtually every request for a permit to fill wetlands.¹⁵⁹

The local government, then, decides whether to allow development to occur in high-hazard areas, a decision that may significantly increase the severity of the natural hazard itself. Local governments also exert substantial control over how development occurs through building codes, which can require construction practices designed to protect against hazards.¹⁶⁰

156. Coastal Zone Management Act, 16 U.S.C. §§ 1451–1464 (2006); Coastal Barrier Resources Act, 16 U.S.C. §§ 3501–3510 (2006). Unfortunately, the federal minimum standards may become the default in many jurisdictions, leading local government officials to question the wisdom of creating obstacles to development that are not required by federal law. See, e.g., BRATTLEBORO SELECTBOARD, MAY 15TH MEETING MINUTES 3 (2007), available at <http://bit.ly/BrattleboroMinutes> (“Tim Cuthbertson asked why we were putting in a more stringent standard that is not strictly required. We are putting in obstacles for new development and should not be mandated.”). For an analysis of the CZMA suggesting that it has caused little change in the development practices in states hostile to restrictive land use, see Oliver A. Houck, *Retaking the Exam: How Environmental Law Failed New Orleans and the Gulf Coast South and How It Might Yet Succeed*, 81 TUL. L. REV. 1059, 1073–76 (2007).

157. 33 U.S.C. § 1344 (2006).

158. See 33 C.F.R. § 320.4(j)(2) (2011).

159. Houck, *supra* note 156, at 1069–73. As Houck explained: “At a time [the early 1980s] when, nationally, Corps permit denials averaged two percent, the New Orleans district was averaging one-tenth of one percent. Clearly, this was a district and a region with a different attitude about protecting wetlands.” *Id.* at 1071.

160. See, e.g., New York City Building Code, Appendix G § G303.7(1) (2011) (prohibiting grading and fill in flood hazard areas “[u]nless such fill is placed, compacted and sloped to minimize shifting, slumping and erosion during the rise and fall of flood water and, as applicable, wave action”), available at <http://publicecodes.cyberregs.com/st/ny/ci-nyc/b200v08/index.htm?bu=YC-P-2008-000006>; City of South Pasadena Florida Building Code § 108-18(A) (“All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure.”), available at

Problems arise because local governments have significant incentives to underregulate, allowing development to occur where it should not and using insufficiently protective practices.¹⁶¹ Local governments typically receive much or all of their funding from property taxes, meaning that more development means more tax dollars and the ability to provide more services to residents. Increasingly, local governments fund public projects based on sophisticated financing instruments that turn projected increases in tax revenue into present dollars.¹⁶² This practice, called “tax increment financing,” only increases the pressure on local governments to maximize development.

On the other side of the ledger, local governments pay relatively little of the costs of disaster, which are largely displaced to the federal government. The federal government has long been in the business of providing financial and technical assistance in the wake of disasters,¹⁶³ and this role has only increased over time.¹⁶⁴ Once a federal disaster is declared, which occurs with increasing frequency,¹⁶⁵ the Stafford Act authorizes payment from the federal treasury to reimburse seventy-five percent or more of the costs local governments pay to rebuild public infrastructure,¹⁶⁶ and local governments often receive a higher percentage.

This is precisely what occurred in Vermont following Hurricane Irene. FEMA authorized reimbursement of ninety percent of the cost

<http://www.ecode360.com/7147993>.

161. See Burby, *Paradoxes*, *supra* note 22, at 178–81.

162. See George Lefcoe, *Competing for the Next Hundred Million Americans: The Uses and Abuses of Tax Increment Financing*, 43 URB. LAW. 427 (2011). Lisa Grow Sun provides a careful description of the redevelopment of the Portland, Oregon, waterfront as an example of public funds, including over a hundred million in tax increment financing, increasing hazard risk. Sun, *Smart Growth*, *supra* note 30, at 2189–90. If serious flooding destroys or severely damages the new development, Portland would have considerable incentive to secure state or federal disaster assistance to enable reconstruction to minimize shortfalls in projected tax revenue already dedicated to future bond payments.

163. See Michele L. Landis, “Let Me Next Time Be ‘Tried By Fire’”: *Disaster Relief and the Origins of the American Welfare State 1789–1874*, 92 NW. U. L. REV. 967 (1998).

164. U.S. GOV’T ACCOUNTABILITY OFFICE, *FEDERAL DISASTER ASSISTANCE: IMPROVED CRITERIA NEEDED TO ASSESS A JURISDICTION’S CAPABILITY TO RESPOND AND RECOVER ON ITS OWN*, *supra* note 76, at 9–11 ; see also *id.* at 29–30 (noting that the current methodology for declaring a federal disaster does not accurately account for the ability of state and local governments to adequately respond).

165. See Thomas Frank, *Disasters’ Strain FEMA’s Resources*, USA TODAY, Oct. 24, 2011, at A1.

166. Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121–5207 (2006).

of repairs¹⁶⁷ and reported providing \$18 million to the state of Vermont and its municipalities by the end of 2011.¹⁶⁸ On top of the federal funding, the state agreed to reimburse local governments for all remaining costs that exceeded the revenue that would be generated by a three-cent tax increase.¹⁶⁹ In Brattleboro, a town that has an annual revenue of over \$14 million and that sustained substantial damage, this translated into a maximum direct cost to the town of about \$340,000.¹⁷⁰

The finances of local governments are, of course, influenced by more than just direct outlays for repair of public infrastructure. Property values may fall in the wake of a natural disaster, particularly if residents or business owners incur high recovery costs themselves.¹⁷¹ The financial wellbeing of those residing within a jurisdiction affects overall economic health. And, of course, democratically elected leaders must be responsive to local concerns.

Local governments receive only mute forms of those signals, however, because individuals suffering losses from disaster also receive substantial subsidies.¹⁷² The federal government provides

167. See FED. EMERGENCY MGMT. AGENCY, RELEASE NO. 4022-080, FEMA WILL GIVE VERMONT 90 PERCENT FUNDING FOR IRENE REPAIR WORK (2012), available at <http://www.fema.gov/news-release/fema-will-give-vermont-90-percent-funding-irene-repair-work>.

168. See FED. EMERGENCY MGMT. AGENCY, RELEASE NO. 4022-072, MORE THAN \$72 MILLION IN DISASTER AID SUPPLIED TO VERMONT IN 2011 (2011) [hereinafter Dec. 2011 FEMA Report], available at <http://www.fema.gov/news-release/more-72-million-disaster-aid-supplied-vermont-2011>.

169. See Memorandum from Sue Minter, Irene Recovery Officer, to Municipal Officials Involved in Irene Recovery (July 11, 2012), available at <http://www.trorc.org/pdf/irene/FEMA%20updates%20for%20PA%20July%202012.pdf>.

170. *Id.*; TOWN OF BRATTLEBORO, 2011 ANNUAL REPORT 65 (2011), available at [http://brattleborovtrebuild.govoffice.com/vertical/Sites/%7BFABA8FB3-EBD9-4E2C-91F9-C74DE6CECDFD%7D/uploads/Town_Report_2011_FINAL1\(1\).pdf](http://brattleborovtrebuild.govoffice.com/vertical/Sites/%7BFABA8FB3-EBD9-4E2C-91F9-C74DE6CECDFD%7D/uploads/Town_Report_2011_FINAL1(1).pdf). A report produced by the U.S. Department of Commerce estimates that Windham County, which contains Brattleboro, will eventually receive \$35 million in public assistance. See U.S. DEP'T OF COMMERCE, VERMONT DR-4022, ECONOMIC IMPACT ASSESSMENT 7 (2012), available at http://vtstrong.vermont.gov/Portals/0/Documents/Vermont_Econ_Impact_Final%20-%2042312.pdf.

171. Where individual property owners bear the cost of recovery the market should internalize that cost as a liability attached to the property, thereby reducing the property's relative value. Cf. David Ariosto, *First Irene, Then Sandy: Jersey City Recovers, Again*, CNN WIRE (Nov. 14, 2012), <http://www.cnn.com/2012/11/14/us/new-jersey-irene-sandy/index.html> (quoting Jersey City resident as saying "[t]he more this flooding happens . . . the lower property values will sink" (ellipses in original)).

172. As will be discussed, significant federal resources are available to home and business owners in the wake of a natural disaster. The Stafford Act does require, however, some

direct financial assistance in the form of individual grants and loans and block grants provided to state and local governments for recovery projects. In the wake of Irene, the federal government provided \$22.7 million in grants and \$17.6 million in low-interest loans to homeowners and renters,¹⁷³ \$19 million in loans to businesses,¹⁷⁴ and over \$20 million in such community development block grants.¹⁷⁵ All told, the federal government is expected to pick up seventy-five percent of the total \$733 million cost of recovering from Irene.¹⁷⁶ Beyond the federal funds, local governments typically receive further subsidies from the state. The state of Vermont, for example, offered to reimburse towns that received reduced property taxes in the wake of Irene and also agreed to pay certain costs of infrastructure repairs not covered by the federal government.¹⁷⁷

Natural disasters' costs are not only shifted to the federal and state governments, but such events also generate substantial charitable donations, making additional funds available to those that live and work in areas affected by natural disasters. This charity

homeowners that have previously received disaster relief to purchase flood insurance to remain eligible for future disaster relief. See 42 U.S.C. § 5154a(a) (2006).

173. See Wilson Ring, *Vt Irene Recovery Bill at \$733M, More Work to Do*, VT. TODAY (June 15, 2012), <http://vermonttoday.com/apps/pbcs.dll/article?AID=/20120615/NEWS03/706159860>; *Southeastern Vermont Irene Long Term Recovery Committee*, WINDHAM COUNTY VT STATUS INFO. (Nov. 15, 2011), <http://www.windhamstatus.org/2011/11/15/southeastern-vermont-irene-long-term-recovery-committee>. FEMA reports that it provided more than \$23.1 million in aid to individuals and families and \$31.2 million in low-interest disaster loans to small businesses. See Dec. 2011 FEMA Report, *supra* note 168. These figures do not include additional funds provided in 2012.

174. See FED. EMERGENCY MGMT. AGENCY, RELEASE NO. 4022-073, FEDERAL AID FOR IRENE, SPRING 2011 FLOODING TOPS \$100 MILLION IN VERMONT (2012), available at <http://www.fema.gov/news-release/federal-aid-irene-spring-2011-flooding-tops-100-million-vermont>; see also U.S. SMALL BUS. ADMIN., FACT SHEET—DISASTER LOANS: VERMONT DECLARATION #12784 & #12785 (2011), available at http://www.sba.gov/sites/default/files/VT%2012784%20Fact%20Sheet%20TS%20Irene%20Amend%205%20adds%203%20cos%209-15-11_1.pdf; *Irene Disaster Loan Deadline is June 1*, TIMES ARGUS (May 14, 2012), <http://timesargus.com/article/20120514/BUSINESS03/705149993/1006/BUSINESS>.

175. See *The US Department of Housing and Urban Development (HUD) Community Development Block Grant Disaster Recovery Funding (CDBG-DR)*, I AM VT. STRONG, <http://vtstrong.vermont.gov/Home/StateRecovery/HUDCommunityDevelopmentBlockGrant.aspx> (last visited Oct. 27, 2012).

176. See Ring, *supra* note 173.

177. See Peter Hirschfeld, *Winners and Losers as Legislature Closes Session*, VT. TODAY (May 6, 2012), <http://www.vermonttoday.com/apps/pbcs.dll/article?AID=/20120506/NEWS03/705069821/-1/NEBJ>; Peter Hirschfeld, *House Approves Tax Relief for Irene-Ravage Towns and Cities*, VT. PRESS BUREAU (Jan. 5, 2012), <http://www.vermontpressbureau.com/house-approves-tax-relief-for-irene-ravage-towns-and-cities>; *Irene and Jobs, a Record of Results*, VERMONT (May 5, 2012), <http://governor.vermont.gov/newsroom-irene-and-jobs-a-record-of-results>.

comes in many forms, from large-scale organizational efforts to celebrity concerts.¹⁷⁸ These funds are, in part, used to provide services to displaced individuals, but money is often made available to rebuild homes and businesses.¹⁷⁹ This, in turn, further reduces the amount of the cost of recovery borne directly either by the individuals living and working in areas subject to natural hazards or the local governments that govern these areas.

All of these sources of funding substantially dampen financial signals to local governments to responsibly manage development in areas subject to natural hazards. Local government officials have the luxury of adhering to the view that the “free market” should drive development because neither the local government, nor its residents, will face the full costs of making foolish choices.¹⁸⁰

That natural disaster aid distorts public policy is not to suggest that it should be stopped altogether. In my view, social policy should encourage an ethic of helping others that have lost their homes and businesses in natural disasters. Catastrophic moments can also build international goodwill and feelings of unity that benefit society. While engaged in response activities in Vermont following Hurricane Irene, one National Guard veteran said, “This is the proudest I’ve been [about] anything I’ve been involved in—being able to help out our neighbors in a time of need.”¹⁸¹ At the same time, it is worth considering the reasons that social and charitable resources are channeled to those afflicted by events that we term “natural” disasters rather than more generally to those in need. That society chooses to provide financial compensation to those harmed by

178. *Grace Potter Concerts Raise \$300,000 for Flood Relief*, BURLINGTON FREE PRESS, Oct. 22, 2011, at W7; see also *Students Hold Penny Drive to Save Covered Bridges*, BURLINGTON FREE PRESS, Oct. 22, 2011, at W12; Hallenbeck, *supra* note 43; Bob Audette, *More Irene Money Coming to Windham County*, CLASSIC HITS 92.7 WKVT (July 21, 2012), <http://wkvt.com/2012/07/20/More-Irene-money-coming-to-Windham-County/13777730>.

179. See, e.g., Kimberly Drelich, *Kellogg Raises \$50,000 for Marine Businesses Harmed by Sandy*, THE DAY (New London, Conn.) (Dec. 29, 2012), <http://www.theday.com/article/20121229/NWS01/312299976/-1/zip06>. In the wake of Superstorm Sandy, the Robinhood Foundation provided more than \$17 million to relief organizations including those dedicated to repairing and rebuilding homes and businesses. See ROBIN HOOD, <http://www.robinhood.org/rhsandy> (last visited Jan. 14, 2013).

180. See Baird Helgeson, *Risky Rebuilding*, TAMPA TRIB., Nov. 5, 2006, at 1. In the wake of Hurricane Ivan, the mayor of Pensacola, hard hit by the storm, opposed any restrictions on development, suggesting instead that the “free market drives [development], the way it should be.” *Id.*; see also PIDOT, *supra* note 18, at 37.

181. Hallenbeck, *supra* note 43, at A1.

floods, hurricanes, and other natural events, but is generally more reluctant to aid those harmed by events perceived as human caused, may largely be a result of the social construction of natural disasters as being caused by nature.¹⁸² Moreover, the fact that a natural disaster is an *event* may distract attention away from the desperate poverty and needs that many of our most vulnerable citizens experience on an ongoing basis.

In addition to distortions caused by vertical divisions of authority between local, state, and federal governments, the relationship between neighboring local jurisdictions impedes sensible development. This horizontal allocation of natural disaster policy vests land-use decisions in local governments whose borders do not neatly map onto geographic features that dictate natural hazards.¹⁸³ Because natural boundaries often span political boundaries, the benefits and costs of one jurisdiction's development policies may be displaced onto neighboring jurisdictions.

Flood risk is a quintessential example. Development within a watershed influences the likelihood and severity of flooding by increasing runoff and reducing natural capacity to absorb high water. In other words, one town's decision to allow disturbance of natural floodplains within its borders may well lead to increased flooding within the borders of lower elevation towns. Moreover, towns in close proximity to each other often compete for commercial and residential development in an effort to channel funding streams into their jurisdiction. This dynamic has the potential to lead to a classic race to the bottom. Local governments may feel pressure to allow land to remain deregulated to attract business, particularly because they fear that the decisions of neighboring towns may undo any effort to curb vulnerability that they attempt. This concern is not just hypothetical. For example, during deliberations by the Brattleboro

182. As Professor Michelle Landis Dauber has argued, differentiation between losses due to "natural" causes and human causes makes little sense from the perspective of those suffering losses. See Landis, *supra* note 163, at 995. In a vivid example of this from early in American history, Daubert contrasts the dramatic losses suffered by a sea captain whose valor led to the capture and criminal trial of would-be pirates with those of individuals whose homes burned in a city-wide fire in Arlington, Virginia. *Id.* at 967–69.

183. The vertical and horizontal relationships discussed here are different than the horizontal and vertical political externalities that Ben Depoorter has identified as arising from disaster management. See Depoorter, *supra* note 144, at 108–10. This Article discusses the relationship between government entities, while Depoorter examined the relationship between political actors and their constituents.

Selectboard on a proposal to limit new impermeable surfaces within floodplains, the concern was raised that the forestry practices of surrounding towns contributed to flooding and would undermine the new policy.¹⁸⁴

Misalignment of political and natural boundaries extends beyond just the relationship of towns. Many natural systems span state and national boundaries, further complicating the policy picture. For example, the Connecticut River, which flooded along significant portions of its length in Hurricane Irene,¹⁸⁵ finds its source in Fourth Connecticut Lake in New Hampshire, flows south along the border between Vermont and New Hampshire, and enters Massachusetts and eventually Connecticut. Its watershed also extends well into Canada. The policy choices of each state and neighboring Canadian provinces work in combination to affect flood risks along the river's entire length.¹⁸⁶

Both the vertical and horizontal dynamics described arise roughly from economic externalities. The policy choices of local governments resulting in increased vulnerability to natural hazards impose considerable costs, but neither the local governments themselves, nor their constituents, fully bear those costs. Instead, these costs are displaced onto state and federal taxpayers, donors, and the residents of neighboring jurisdictions. Put another way, the decision of local government officials to enact sensible policies to control development in areas subject to natural hazards creates some benefits felt beyond their borders, which benefits local government officials cannot capture and, therefore, have little incentive to pursue.

Beyond these problems, which we might consider economic in nature, disaster policy also presents a prime opportunity for

184. See, e.g., BRATTLEBORO SELECTBOARD, APRIL 17 MEETING MINUTES 2 (2007), available at <http://bit.ly/BrattleboroMinutes>; BRATTLEBORO SELECTBOARD, APRIL 17TH MINUTES 2 (2007), available at <http://www.brattleboro.org/vertical/Sites/%7BF60A5D5E-AC5C-4F97-891A-615C172A5783%7D/uploads/%7B04A5BE4C-AAFC-4E5E-8512-4790A373738B%7D.PDF>.

185. See Jim Kinney, *Hurricane Irene Still Swelling Rivers; Connecticut Yet to Crest in Holyoke*, Springfield, REPUBLICAN (Springfield, Mass.), Aug. 29, 2011.

186. The great rivers of the western United States span jurisdictions too numerous to list and have resulted in complex international treaties between the United States, Mexico, and Canada to govern flood control projects and the allocation of water. See, e.g., Barbara Cosens, *Resilience and Law as a Theoretical Backdrop for Natural Resource Management: Flood Management in the Columbia River Basin*, 42 ENVTL. L. 241, 243 (2012).

government capture.¹⁸⁷ That is because the cost of bad policy is both broadly distributed (to federal taxpayers, for example) and unpredictable, while the benefits of bad policy are highly concentrated in a few highly organized and well-funded industries. Public choice theory suggests that in such circumstances, policymakers disproportionately favor the interests of the few, even if doing so undermines social welfare.¹⁸⁸ This means that even where ample information about disaster risk exists, there may be “no politically powerful constituency ready to support legislators and agency officials” advocating for policies to reduce disaster vulnerability.¹⁸⁹ Moreover, disaster policy may be particularly subject to government capture because of the symbolic and cognitive obstacles discussed above. The public misperceives risk and overvalues reconstruction as a signal of societal resolve.¹⁹⁰ As a result, even where regulation would enhance social welfare, the public may provide little or no counterbalance to the significant influence wielded by the development community.

Return again to the debate in Brattleboro about restricting development in floodplains. The public debate consistently referenced concerns about restricting development, and the development community generated opposition.¹⁹¹ This same dynamic plays itself out around the country and on the national stage. In California, for example, the development community has fiercely opposed development restrictions in floodplains in the central valley, where more than 750,000 people already live in

187. Government capture refers to the often-documented phenomenon whereby a highly-motivated interest group can disproportionately influence—in other words, “capture”—government policy. See Timothy K. Kuhner, *The Separation of Business and State*, 95 CALIF. L. REV. 2353, 2362 (2007); John S. Wiley Jr., *A Capture Theory of Antitrust Federalism*, 99 HARV. L. REV. 713, 724 (1986).

188. See, e.g., Depoorter, *supra* note 145, at 108–09; see also ROBERT R. M. VERCHICK, FACING CATASTROPHE: ENVIRONMENTAL ACTION FOR A POST-KATRINA WORLD 54–56 (2010); see also Daniel A. Farber & Philip P. Frickey, *The Jurisprudence of Public Choice*, 65 TEX. L. REV. 873, 892 (1987) (discussing origins of the public choice economics account of legislation).

189. Lazarus, *supra* note 41, at 1045.

190. See discussion *supra* Parts II, III.

191. Bob Audette, *Board Nixes Erosion Hazard Regulation*, BRATTLEBORO REFORMER (Brattleboro, Vt.), Jan. 20, 2010; Joel B. Baird, *Brook's Rage Cuts Off Brattleboro Residents*, BURLINGTON FREE PRESS (Burlington, Vt.), Aug. 30, 2011, at B4; see also Michael Grunwald, *Wetlands Protection Rules Due; Army Corps Would Slow Development*, WASH. POST, Mar. 3, 2000, at A1; Spencer Hunt, *Groups Object to Big Darby Plan; Builders and Landowners Tell State that Proposed Protections Go Too Far*, COLUMBUS DISPATCH (Columbus, Ohio), Mar. 22, 2006, at C1.

floodplains.¹⁹² In Birmingham, Alabama, soon after forming an advocacy organization, business and development interests successfully scuttled plans to substantially curtail development in the floodplain of Five Mile Creek, which had flooded in 2003 causing a billion dollars in damage.¹⁹³ And in Brevard County, Florida, a large development company lobbied for looser development restrictions within the ten-year floodplain.¹⁹⁴ Indeed, developers have even opposed requirements to notify potential buyers that property lies within a twenty-five-year floodplain.¹⁹⁵ The political advocacy of the development industry makes sense since building in areas subject to natural hazards and, indeed, responding to natural events generates substantial revenue.¹⁹⁶ Economic losses, on the other hand, are paid out by the federal treasury and, therefore, policies to reduce those losses lack a concentrated constituency.

Other political dynamics also impede effective disaster policy. Natural hazards are probabilistic and require long planning horizons, while elected officials tend to have a short-time horizon calibrated to achieve reelection. From the perspective of an elected official, gains likely to occur during their term in office are more valuable than losses that will accrue outside of that time period.¹⁹⁷ So, for example, politicians may be more sensitive to an immediate influx of tax dollars than to the greater social costs that may not actualize until decades in the future. Disaster policy may also fail to get on the agenda of policymakers because other issues, such as school funding,

192. Elliot Diring & Ramon G. McLeod, *Floods Warn Valley of Worse to Come: Storms, Growth Expose Region's Rising Risk*, S.F. CHRON., Mar. 3, 1997, at A1.

193. See Jeff Hansen, *New Business Alliance Flexes Its Muscles to Get Its Way; Foes Accuse BARD of Putting Its Desires Above Community's*, BIRMINGHAM NEWS (Ala.), Dec. 10, 2006, at 1.

194. *County Delays Wetlands Changes*, FLA. TODAY (Melbourne, Fla.), June 3, 2010, at B1.

195. See Brian Haas, *New Homes Plan Passes*, BRADENTON HERALD (Bradenton, Fla.), Aug. 9, 2002, at C1.

196. Insurance companies are an interesting case. They make money off of providing a hedge against risk but also face steep losses when natural disasters strike. This dichotomy incentivizes the company to reduce vulnerability—either by declining to offer insurance or reducing the risks faced by the properties they insure—or find other sources of financing to lay off some of their risk. In recent years, the federal treasury has been an attractive target and there has been a concerted, although as of yet unsuccessful, effort to secure passage of legislation to create federal multi-peril insurance. See PIDOT, *supra* note 18, at 48–49; Gene Taylor, *Federal Insurance Reform After Katrina*, 77 MISS. L.J. 783, 790 (2008). The business of transacting insurance claims has its own constituency. See Russell Grantham, *Hitting the Road After Catastrophe*, ATLANTA J.-CONST., Sept. 4, 2011, at D1.

197. Brian Galle, *The Tragedy of the Carrots: Economics and Politics in the Choice of Price Instruments*, 64 STAN. L. REV. 797, 847 (2012).

law enforcement, and unemployment, have more immediate effects.¹⁹⁸

V. CONCLUSION

I have focused on obstacles to sensible disaster policy and they present something of a grim picture. The language we use, the political systems we rely upon, and even the way that we think thwart efforts to regulate behavior in response to natural hazards and result in ever-increasing vulnerability. And these obstacles often interact, creating a policy landscape particularly hostile to reform.

The interactions between and among the three obstacles take many forms. The discourse of disaster causes people to view positively efforts to rebuild because within the metaphor of armed conflict, rebuilding means defying the efforts of the enemy and failing to rebuild means retreat. The positive emotion this symbolism vests in reconstruction may, in turn, trigger the affect heuristic, resulting in exaggerated belief about the safety of rebuilding in hazardous locations.

Cognitive errors simultaneously feed back into the symbolic value placed on rebuilding in the wake of disaster. People systematically underappreciate the degree of risk of building in areas subject to natural hazards, making reconstruction appear relatively risk free. In other words, people perceive victory over nature as relatively easy to achieve because cognitive biases make natural hazards appear less dangerous. Where victory appears cheap, courses of action that lead to perceived defeat will be treated as particularly suspect.

These cognitive and symbolic obstacles reinforce the perverse incentives created by the allocation of governmental authority over disaster policy. Local government officials do not only have political incentives not to restrict development, but those incentives are buttressed by their own cognition and the skepticism of the public driven by the cognitive and symbolic dimensions of natural disaster. And, as we have seen, government officials often draw on the armed conflict metaphor, reinforcing the symbolic value attached to reconstruction in the wake of natural disaster.

198. See MILETI, *supra* note 16, at 160.

Recent history bears out the power of these dynamics. Economic losses attributed to natural disasters double every decade, and there is no end in sight.¹⁹⁹ Transforming coastlines, riverbanks, and mountain forests into houses and storefronts also disturbs fragile and important ecosystems, which once provided natural protection against disaster.²⁰⁰

Still, hope remains. The enormity of economic loss is becoming too big to ignore, particularly at a time of increasing scrutiny on government spending. The time may finally be ripe for reform. However, enacting, implementing, and persisting with sensible approaches to natural disasters will require a coordinated approach that takes account of the suite of obstacles discussed in this Article.

None of these obstacles is insurmountable. New institutional arrangements can realign regulatory authority and financial responsibility.²⁰¹ This could take the form of increasing federal responsibility for land-use decisions in hazardous areas. The Army Corps of Engineers could play this role, at least in part, through existing authority under the Clean Water Act. Alternatively, local governments could assume increasing financial responsibility for recovery, creating incentives for better land-use regulation. Local governments could also enter into collaborative partnerships with one another to better coordinate development across jurisdictional lines.²⁰² Or, states could step in, playing a larger role in both planning for natural disasters and paying their price.

Law that generates public information about disaster risk—for example, by providing updated, publicly available, and highly visible flood maps or requiring sellers to disclose natural hazard risks to would-be purchasers of property—may debias, at least to some extent, perceptions of risk. In some circumstances, insurance premiums that correctly reflect risk may serve this role. The cost of insurance can focus the mind, making concrete probabilistic risks that might otherwise be overlooked.²⁰³ At the same time, insurance

199. See FARBER, ET AL., *supra* note 12, at 3.

200. See VERCHICK, *supra* note 188, at 11–24. Robert Verchick suggests that we think of natural conditions that provide services, including disaster-prevention or mitigation services, such as “green infrastructure,” so that they will not get overlooked in development planning. *Id.*

201. See Burby, *Paradoxes*, *supra* note 22, at 181–86; Hudson, *supra* note 25, at 1998–99; Lazarus, *supra* note 41, at 1046–53.

202. See Hudson, *supra* note 25, at 2057–60.

203. See PIDOT, *supra* note 18, at 47. The requirement that owners of homes in one-

markets do not provide a panacea because they are subject to many of the same dynamics this Article has discussed. During the debate surrounding reauthorization of the NFIP, virtually everyone agreed that premiums offered through the program should be “actuarial.”²⁰⁴ But as often, proponents of government insurance programs call for “affordability,” and actuarially sound rates for buildings subject to high risks will often be unaffordable.²⁰⁵ Recent legislation made some improvements to the NFIP: phasing out explicit subsidies, allowing updated flood maps that reflect land-use decisions, and considering a longer timeframe for determining average losses.²⁰⁶ In the future, the program could be further modified to front-load payments so that developers themselves feel the squeeze, and this could more effectively calibrate development decisions to the risk of natural hazards.

Political leaders should also consider the language they use in discussing disaster. Invoking the metaphor of war can prime a demand for reckless reconstruction without regard for the likelihood of future losses. Emphasizing the human role in creating circumstances in which natural events can lead to devastation may facilitate more rational development policy.

For decades, America has pursued a reckless path of building in areas threatened by severe risks from inevitable natural disasters. When disaster has struck, America has rebuilt, setting itself up for

hundred-year floodplains acquire flood insurance to secure federally insured mortgages assists with this price-signaling effect. See 42 U.S.C. § 4012a(b)(1) (2006). Many individuals subject to this legal requirement nonetheless remain uninsured, and the NFIP has struggled to increase the number of other homeowners that purchase flood insurance. See LLOYD DIXON, ET AL., THE NATIONAL FLOOD INSURANCE PROGRAM’S MARKET PENETRATION RATE: ESTIMATES AND POLICY IMPLICATIONS, at xvi–xvii (2006).

204. See generally PIDOT, *supra* note 18.

205. See PIDOT, *supra* note 18, at 15. In one celebrated case, the owner of a Houston-area home valued at \$115,000 received over \$806,000 in insurance payments over eighteen years due to sixteen flooding events. See Francesca Ortiz, *The Tide is Nigh: Rethinking Urban Flood Management*, 9 CHAP. L. REV. 435, 448 (2006). Risks of this magnitude and frequency may be insurable because it is possible to predict the likelihood of an insured event occurring and the amount of loss. See, e.g., Michelle E. Boardman, *Known Unknowns: The Illusion of Terrorism Insurance*, 93 GEO. L.J. 783, 813 (2005). But an actuarially-adjusted premium would likely be unaffordable. That would not be a function of the insurance market failing, however, but rather of an irrational decision to develop on such disaster-prone property.

206. See JESSICA GRANNIS, GEORGETOWN CLIMATE CTR, ANALYSIS OF HOW THE FLOOD INSURANCE REFORM ACT OF 2012 (H.R. 4348) MAY AFFECT STATE AND LOCAL ADAPTATION EFFORTS (Aug. 2, 2012), available at <http://www.georgetownclimate.org/sites/default/files/Analysis%20of%20the%20Flood%20Insurance%20Reform%20Act%20of%202012.pdf>.

another round of destruction. As the president of a real estate firm in New York explained in the wake of Superstorm Sandy, “[I]f history teaches us anything, people always rebuild and they always come back.”²⁰⁷ Fortunately, some government officials and private individuals are beginning to ask the right questions. After Superstorm Sandy, the opinion pages of leading newspapers broadcast the message that the time has come to rethink our approach to building—and rebuilding—in hazard-prone places.²⁰⁸ In the wake of Hurricane Irene, a report published by the Vermont Agency of Natural Resources posed similar questions: “[W]hat will we learn from Irene’s impacts, knowing that severe flooding may continue to become more common? How can we rebuild intelligently, incorporating greater flood resiliency in our communities while protecting our natural environment?”²⁰⁹ Such inquiry is far from the norm, and the suite of obstacles one must confront in facing disaster policy discussed in this Article have historically overcome common sense. But if the nation can successfully grapple with these questions and overcome the obstacles to disaster policy, the next hurricane may simply be a notable weather event and not a natural disaster.

207. Ariosto, *supra* note 4.

208. See, e.g., James D. Fraser, et al., *We’re Too Close to the Sea*, WASH. POST, Nov. 21, 2012; Margaret Hartley, *Effects of Sandy Should Impel Us to Try to Tread Carefully*, DAILY GAZETTE (Albany, N.Y.), Nov. 4, 2012, at E10; Roger K. Lewis, *Heeding the Cruel Housing Lessons of Hurricane Sandy*, WASH. POST, Nov. 16, 2012; Norbet P. Psuty, *The Data Is In. Now We Need Action*, N.Y. TIMES, Nov. 27, 2012.

209. See Sacha Pealer, *Lessons from Irene: Building Resiliency as We Rebuild*, VT. AGENCY OF NAT. RES. (Jan. 4, 2012), http://www.anr.state.vt.us/anr/climatechange/Pubs/Irene_Facts.pdf.