Rebecca Elliott

'Scarier than another storm': values at risk in the mapping and insuring of U.S. floodplains

Article (Accepted version) (Refereed)

‘Scarier than another storm’: Values at risk in the mapping and insuring of U.S. floodplains[1]

Rebecca Elliott
Department of Sociology
London School of Economics
Houghton Street
London WC2A 2AE
United Kingdom
r.elliott1@lse.ac.uk

[1] **Acknowledgements:** The author wishes to thank Marion Fourcade, Calvin Morrill, Fabien Accominotti, Liene Ozolina-Fitzgerald, Leon Wansleben, Tim Monteath, Liz Koslov, Daniel Aldana Cohen, Dan Hirschman, and Rachael Schwom, as well as the anonymous reviewers, for their constructive comments and advice on earlier drafts.

ABSTRACT

How do people respond to the ways in which insurance mediates environmental risks? Socio-cultural risk research has characterized and analyzed the experiential dimension of risk, but has yet to focus on insurance, which is a key institution shaping how people understand and relate to risk. Insurance not only assesses and communicates risk; it also economizes it, making the problem on the ground not just one of risk, but also of value. This article addresses these issues with an investigation of the social life of the flood insurance rate map, the central technology of the U.S. National Flood Insurance Program (NFIP), as it grafts a new landscape of 'value at risk' onto the physical and social world of New York City in the aftermath of Hurricane Sandy. Like other risk technologies, ubiquitous in modern societies as decision-making and planning tools, the map disseminates information about value and risk in order to tame uncertainty and enable prudent action oriented toward the future. However, drawing together interview, ethnographic, and documentary data, I find that for its users on the ground, the map does not simply measure 'value at risk' in ways that produce clear strategies for protecting property values from flooding. Instead, it puts values—beyond simply the financial worth of places—at risk, as well as implicates past, present, and future risks beyond simply flooding. By informing and enlarging the stakes of what needs protecting, and from what, I argue that plural and interacting 'values at risk' shape how people live with and respond to environmental risks that are mediated by insurance technologies.

KEYWORDS

Risk, insurance, flood, value, map

In October 2014, the Office of the New York City Comptroller calculated that the city had over U.S. $129 billion of property value at risk of flooding. This calculation was made possible by new 'flood insurance rate maps' produced by the Federal Emergency Management Agency (FEMA) and used to set flood insurance premiums for homes and small businesses through the U.S. National Flood Insurance Program (NFIP). The new maps showed that the official flood zones had expanded; the property value at risk had increased as a result, 120 percent over the previous maps. In his report, the Comptroller concluded that this assessment of 'value at risk' should motivate spending today that would help the city's residents to adapt to a potentially traumatic future: 'With such immense value arrayed along the City's coast, we must act now to make the necessary investments to protect our homes, our businesses and our neighborhoods from the future effects of climate change… While the costs of resiliency projects are high, investing in the City's future will pay enormous dividends, both to our waterfront communities and our broader economy' (Stringer 2014).

As the Comptroller's report illustrates, information about value and risk is meant to guide prudent action oriented toward the future. Insurance technologies, such as the NFIP's maps, ostensibly tame uncertainty and thereby empower individual and collective actors to act with greater confidence, to take informed steps that will avoid or minimize future losses (Beck 2006; Zinn 2016). But as New Yorkers confronted these new maps in the months following Hurricane Sandy, they responded with alarm. The new maps were 'scarier than another storm,' in the words of one Rockaway, Queens homeowner (Interview, 21 October 2013). Drawing together interview, ethnographic, and documentary data, this article examines the social life of the flood insurance rate map as it grafts a new landscape of 'value at risk' onto the physical and social world of New York City in the aftermath of Hurricane Sandy. By situating the flood map in time and place, I find that for its users on the ground, the map does not simply measure 'value at risk' in ways that produce clear strategies for

protecting property values from flooding. Instead, it *puts* values—beyond simply the financial worth of places—at risk, as well as implicates past, present, and future risks beyond simply flooding. These 'values' include shared beliefs, as well as attributions of emotional and social worth attached to places, put 'at risk' not only of flood, but of economic strain, political change, and uncertain threats from climate change. In light of these findings, I argue that by informing and enlarging the stakes of what needs protecting, and from what, plural and interacting 'values at risk' shape how people live with and respond to environmental risks that are mediated by insurance technologies.

In the sections that follow, I begin by outlining an analytical framework that employs the theoretical and methodological approach of socio-cultural risk research to investigate the understudied experiential dimension of insurance technologies. Doing so focuses attention on not only the social construction and complex local meanings of risk, but also of value. By economizing risk, insurance deploys information about value to make the financial stakes of a particular risk relevant to decision-making. Socio-cultural risk research, extended to this empirical site, can also address the potential plurality of relevant forms of value for shaping strategies of what to do about flooding. I then describe my methodology and data before providing a brief account of how the NFIP economizes flood risk, on the basis of flood maps in order to reduce that risk, and of the remapping of flood risk in New York City. I present evidence and analysis of plural values and risks in time and place. In the conclusion, I discuss the broader heuristic usefulness of analyses of 'values at risk' for clarifying what is at stake for individuals and communities, and what they seek to protect, when confronted with the visualization and economization of changing environmental risks.

Insurance technology, risk and value in socio-cultural risk research

Risks and their technical management are a preoccupation of modern societies (Baker and Simon 2002). Public authorities deploy scientific technologies of risk assessment in order

to generate information about various harms that can guide individual and collective decision-making, distribute resources, and mitigate threats (Collier 2014; Lakoff and Klinenberg 2010; Power 2004; Hutter 2010; Rothstein, et al. 2006). In the context of natural hazards, risk technologies define where or what is 'at risk' and how risky that place or property is (Zeiderman 2016). To produce flood and other natural hazard maps, for instance, risk experts assimilate historical data from past events and current data on topography, and potentially other variables, in order to depict risk visually, as zones of higher or lower risk (Porter and Demeritt 2012; Wetmore 2007). As sociologists have shown across a variety of empirical sites, however 'objective' these analyses might appear, technologies are neither politically neutral nor socially inert. When deployed in the service of risk assessment, technologies create risk objects and define frames of reference for their users (Hilgartner 1992; Wynne 1992). They thereby participate in the social construction of risk, both reflecting and enacting commitments regarding what is relevant to its definition and management (Perrow 1984; Webb 2011). The social science of risk has treated insurance as a risk technology primarily from a Foucauldian perspective, looking at how it formats people and social processes (Collier 2014; Johnson 2013; Simon 1988; O'Malley 1996, 2004). The flood insurance rate map indeed formats the experiential dimension of risk, shaping experiences and understandings as well as specifying strategies of action, but in ways that necessarily interact with prevailing social conditions. Beyond the initial moment of formatting, how do people respond to the ways in which insurance mediates environmental risks? What could make something like a flood insurance rate map 'scarier than another storm'?

Within the sociology of risk, a tradition of socio-cultural research has developed the methodological and theoretical tools best suited to answering these questions, which pertain to the experiential dimension of risk. This research examines risk in the social fabric, paying

particular attention to the 'spatially and temporally patterned dynamics involved in risk issues' (Pidgeon, et al. 2006: 96). People situate risks relative to the 'time and place coordinates' of their lives (Tulloch and Lupton 2003: 108; see also Lupton 2013) and formulate their understandings of risk and responses to it in light of a range of contextual factors, only some of which might have to do with the natural hazard or technological risk itself, as researchers often presume (Pidgeon, et al. 2006; Wynne 1992). By employing qualitative and interpretive research strategies, this scholarship has shown that the 'risks' residents perceive, or to which they ascribe paramount importance in their daily lives, may instead issue from political institutions, experts, or more general conditions of anxiety and precarity (Baxter and Lee 2004; Irwin, Simmons and Walker 1999; Parkhill, et al. 2010; Wilkinson 2001; Irwin and Wynne 1996). This body of research thus suggests the answer to the question of how people respond to the insurance mediation of environmental risks can be found in the particular ways in which insurance gives meaning to risk. In order to investigate this, I situate the flood map—the central instrument of flood insurance—in time and place. In doing so, I maintain an empirical openness to multiple, coexisting, and potentially mutually influencing meanings of risk, as demonstrated by socio-cultural risk research, which produce local risk orientations that interpret environmental hazards in the context of a wider set of perceived vulnerabilities.

Much of socio-cultural risk research seeks to empirically clarify some of the plausible but unexamined assertions about life in a risk society made in Beck's foundational work. Beck (1992, 1999) was himself keenly interested in insurance. However, socio-cultural risk research has not yet focused on insurance as a key mediator of the experience of environmental and other risks. Yet insurance is central to how people relate to certain perils, which suggests greater attention ought to be paid to the economization of environmental risk. Through economizing risk— articulating a physical risk to a market mechanism—insurance

makes environmental risk a financial matter, something that must be managed at the level of a household's and/or a local community's economy, whether or not the insured understand, believe in, or care about the underlying risk per se. As such, the map of flood risk may be scarier than the flood itself because of it is not just a flood map: it is a flood *insurance rate* map. It can have near- and long-term economic consequences. Maps showing higher flood risk mean higher flood insurance premiums. Higher risk and higher premiums threaten property values and local tax bases, i.e. properties at high risk of flooding, with expensive flood insurance premiums as a result, scare off potential buyers. This is highly consequential in the U.S. context, where the economic security of many people is bound up in the property values of their homes. Socio-cultural research recognizes the relevance of economic conditions as part of the social context that influences risk experiences and orientations, but it rejects a determining role for economic value and interests as 'overly limiting models' of local risk orientations (Parkhill, et al. 2010: 52; see also Eiser, van der Pligt, and Spears 1995). Nevertheless, in this case, insurance rating made possible by the flood map can significantly change the material implications for the mapped community and for the individuals therein—whether or not they are worried about flooding. We should therefore also address how the economic consequences attendant on changing depictions of risk are interpreted and experienced.

By making the understudied mediation of risk by insurance technology its empirical focus, this article also analytically centers *value* as it is deployed and understood in the context of economized risk. The flood map is meant to motivate action on the basis of information not only about risk, but also about value, incentivizing the kinds of risk mitigating decisions suggested in the Comptroller's report in order to produce flood-resilient changes to the built environment (Aerts, et al. 2014). However, sociologists know that financial or monetary value is embedded in and interacts with other aspects of social

organization, which can impact how those values then shape social action (Fourcade 2011; Beckert and Aspers 2011). How might the flood map implicate values beyond the financial? How do the economic changes enacted by the flood map potentially interact with other forms of value, shaping how people respond to the insurance mediation of flood risk? In the analysis, the attention to multiple meanings of risk is thus coupled with a more pluralist understanding of the forms value can take. Multiple forms of value do indeed appear as disparate findings across socio-cultural risk research—sometimes explicitly, sometimes implicitly—as imbricated with the meaning ascribed to risk and how people respond to it. Affectively charged values, in the sense of beliefs or moral commitments, as well as a sense of 'being valued' shape perceptions of risk at the level of individual biography (Tulloch and Lupton 2003; Irwin, Simmons and Walker 1999; Henwood, et al. 2008, 2011; Parkhill, et al. 2010, 2011). Non-financial attributions of worth, i.e. valued social relationships or 'ways of life', which provide a sense of belonging and well-being, are bound up with experiences and understandings of 'risky' places (Masuda and Garvin 2006; Bickerstaff and Walker 2001; Henwood, et al. 2008; Parkhill, et al. 2010). Shared values also form a central part of the cultural worldviews that participate in the construction of risk (Douglas 1992; Douglas and Wildavsky 1982; Dake 1992). This research has not yet thematized values, though insurance is a site in which value is explicitly mobilized to shape strategies of action. Plural values and risks together may influence understandings of and strategies for what to do about the problem of flooding, in ways that may defy the expectations of informed, confident action expected to follow from 'taming' uncertainty by visualizing and economizing flood risk.

Methodology and data

In addition to the interpretive approach of socio-cultural risk research, the design of the broader study draws on relational approaches to qualitative research, which point attention to the 'points of contact and conflict' between differently positioned actors, rather

than pre-determined, bounded categories of people, e.g. 'residents' or/versus 'experts' (Desmond 2014: 555). As Zeiderman (2016) notes, in the context of risk governance, 'Although technical experts attempt to separate themselves from the humans and nonhumans they seek to define, measure, and manage, they rarely succeed at doing so; they almost always remain entangled with them' (90). This approach allowed me to capture issues as they developed and as actors attempted to navigate them in context and through interaction with each other (Lamont and White 2007). For this study, these points of contact were around the flood map and insurance premiums. The project involved interviews with 65 actors who encounter and interact with flood insurance; 'users' of the flood insurance rate map in particular include: affected residents, insurance professionals, New York City and federal government officials, housing and consumer advocates, lawyers, urban planners, floodplain managers and engineers, and New York state legislators. Through these interviews, I sought to capture accounts, experiences, and understandings of the 'problems' and 'solutions' that were salient to respondents, as well as what was at stake in the decision of what to do, or what to advise residents to do, in response to the new landscape of risk and value.

In the same spirit, I traversed the many settings across the city in which maps and insurance were applied, discussed, and/or debated in order to collect ethnographic data, over the course of October 2013-November 2014. These included door-to-door canvassing by FEMA community liaisons; hurricane recovery meetings convened by local civic associations, non-profits, and local government; meetings of architects' organizations; meetings of housing counselors; and flood insurance 'help desk' events convened by housing organizations, where residents consulted lawyers, housing counselors, architects, planners, and insurance professionals. I coded interview transcripts and field notes using an inductive-deductive approach. With a set of start-codes from the literature, I created categories in and with the data related to risk response and experience. Within this focus, what I came to

recognize as problems of time and place emerged inductively as salient themes. Further analysis of this data allowed me to see that these 'problems' pertained to how multiple relevant values and risks introduced into view more, and sometimes competing, considerations for users of the map in deliberations over what to do about flooding. Documentary data relevant to this analysis also come from reports of the City of New York, RAND, and the National Academies of Science.

Flood as an economized problem: the NFIP and the remapping of flood risk in New York City

Before turning to how New Yorkers responded to the new flood insurance rate map, here I explain how the NFIP enacts a particular logic of risk reduction through the economization of risk, though this logic has failed in practice in New York City and in floodplains nationwide. The NFIP provides virtually all flood insurance for homes and small businesses in the U.S. Since 1973, purchase of flood insurance has been mandatory for all property owners with federally backed mortgages in the official high-risk flood zones depicted on the program's flood insurance rate maps. The NFIP assigns an actuarial (i.e. risk-based) rate, incorporating from the maps the flood zone and 'base flood elevation' (BFE, the height of expected floodwaters), to insured properties. Premiums can be lowered through risk mitigating actions, e.g. elevating the home above the BFE or relocating out of the high-risk flood zone. Nationwide, the NFIP thus is meant to incentivize specific rational strategies of action on the basis of economized risk: risk mitigation both saves money on flood insurance premiums, by reducing the risk to the property, and protects property values, as suggested by the Comptroller's report.

In practice, the NFIP has not charged risk-based rates to a significant number of policyholders, nor has it consistently enforced the mandatory purchase requirement, allowing builders to continue to develop and sell homes in floodplains around the country while shifting risk to homeowners and taxpayers. When Sandy hit, 20 per cent of policyholders

nationwide and 75 per cent of the policies in force in New York City were eligible for subsidies (City of New York 2013). A 'grandfathering' provision had also allowed property owners to keep older (typically lower) rates when their maps changed (Committee on the Affordability of National Flood Insurance Program Premiums 2015).[1] Three months before Sandy hit, Congress passed the Biggert-Waters Flood Insurance Reform Act, which would phase out these 'below-risk' rates from the program, justified in part as a way to keep the program financially solvent and to encourage rational decision-making in the face of worsening flood risk due to climate change (Elliott 2017). When this reform passed, FEMA was in the middle of updating its maps for the greater New York City area, the city's first significant update since 1983. City officials had long been requesting updated maps. In 2007, then-Mayor Michael Bloomberg launched his 'PlaNYC' effort to make New York City 'greener' and 'greater,' specifically launching initiatives to deal with climate change that included formally calling upon FEMA to update the City's flood insurance rate map to account for sea level rise (City of New York 2011). With Biggert-Waters in place, however, when this new map was adopted, it would enact the NFIP's shift towards full actuarial rating—which would subsequently take place in communities all over the country as their own maps were updated.

Hurricane Sandy barreled into New York City in October 2012, destroying property at the city's waterfront where many of its working-class residents own homes.[2] The city's effective maps, based on 1983 data, had predicted only 54 per cent of the Sandy-flooded area in Queens and 67 per cent of the Sandy-flooded area in Staten Island (Shaw 2013). Twenty-three percent of homeowners had flood insurance before Sandy (Dixon, et al. 2017). In the

[1] For reasons of space, this article cannot address the history and politics of subsidies and grandfathering in detail; see Knowles and Kunreuther (2014) and Elliott (2017).

[2] These are also the areas of the city with high concentrations of public housing. I do not address the distinct experiences of public housing residents who, because they are not homeowners, are not subject to the changes to flood maps and insurance in the same way (though they are certainly affected by any planning undertaken by the city in response to the revised estimate of risk).

wake of the storm, local and federal officials wanted residents to have the 'best available' information about flood risk and insurance, given the changes to the maps and the loss of below-risk rates—especially because property owners who received federal assistance after Sandy would be required to purchase flood insurance. After some consultation with city staff, FEMA released a series of draft maps. Each draft revised the boundaries of the flood zones and the BFEs, but the general tendency was apparent from the first: the official flood zones had grown and the BFEs were going higher. Ultimately, the maps put almost 400,000 New Yorkers in the City's high-risk flood zones, making it the nation's largest floodplain by population, and more than doubled the number of structures inside the zones from around 35,000 to 71,500 (Department of City Planning 2014).

Across the newly mapped high-risk flood zones, 90 per cent of one-to-four family properties were owner-occupied; just under 40 per cent of households were low income. With the loss of subsidies and grandfathering, the median premium for one-to-four family properties in high-risk zones would increase from $3,100 to $5,600 per year, and at least 25 per cent of policyholders would pay premiums in excess of $12,300. For properties mapped into the flood zones for the first time, the median premium would increase from $2,700 to $4,200, and at least 25 per cent of property owners would pay in excess of $4,700. Thirty-three per cent of households would be housing-burdened (i.e. a ratio of homeownership costs to household income greater than 0.4) by the increases to flood insurance under the new maps and with grandfathering eliminated. This could increase the likelihood of loan defaults (Dixon, et al. 2017). In the words of an official with the New York City Department of City Planning, addressing a meeting of architects, the maps would create 'a substantial amount of economic and financial pressure to become resilient,' i.e. to elevate or relocate to avoid or lower these rising premiums (Field notes, 29 October 2014). The City's Sandy recovery program, Build It Back, would help homeowners navigate their options in light of these

changes, with ‘pathways’ that included additional financing for home elevation and buyouts of homes.

Values at risk in time and place

In its use for public policy, the flood insurance rate map frames ‘value at risk’ as the relationship between ‘objective’ measures of specific properties of things, that is, the specifically *financial* value of the built environment in a given location and its risk *of flooding*. In so doing, it asserts and privileges the characteristics of a place that are presumed relevant to decision-making and enacts a temporality of action based on a singular risk, wherein knowledge of current flood risk, based on knowledge of the past, is meant to motivate behavior oriented toward future expectations (Lane, Landström, and Whatmore 2011). As such, the Comptroller emphasized the financial returns to mitigation, not only in the form of savings on yearly insurance costs, but also in the form of protected property values. In the wake of Sandy, New Yorkers also by and large understood they were at risk of floods; a post-storm survey of homeowners in flood prone areas of New York City found that 86 per cent of respondents believed they lived in a high flood risk area (Botzen, Kunreuther, and Michel-Kerjan 2014). Yet despite the financial value at stake, and despite the apparent flood risk, communicated through the flood insurance rate map, the matter of how to respond in New York City was not straightforward. In this section, I examine the social life of the flood map in New York City and uncover what values it *puts* at risk, and at risk from what, for its users on the ground. For the sake of analytical presentation, I organize the findings below around risks in time and values of/toward place, in order to address the time- and place-situated experiential dimension of this economized risk, though these are of course intertwined in the context of a life or in the making of any broader social change.

Multiple risks in past, present, and future

The map does more than simply measure current flood risk. For its users in New York City, the map was the apparent source of new economic risk; it exposed political risks surrounding flood insurance; and it posited an ambiguous relationship to climate change risk. As socio-cultural researchers have shown in other empirical contexts, what it therefore means to be 'at risk', or what one is at risk of/from, is invested with multiple meanings for actors on the ground, unfolding along multiple timelines, such that decisions cannot be undertaken with reference to the intensifying flood risk alone. Grace, in Broad Channel, Queens, raised her home once before in order to mitigate her risk and lower her flood insurance premiums. The new map showed she was at higher flood risk and she was considering elevating again, but this was an expensive proposition:

> 'You're going to have to come up with another 100K. Where am I going to get another 100 grand? Do you know how much it took to save 100 grand? OK, I'll save it, but my kids won't go to college' (Interview, 26 February 2014).

Grace knows that raising her home again will save her money on flood insurance in the future as well as protect the resale value of her home; she understands the financial incentives. But she also knows what it took for her to raise the money before, and she knows that spending the money on this now will require tradeoffs over time that she feels are inhumane. Protecting the home from flooding today may mean no money in the future to support her children's education—the creation of another kind of economic risk, in the broader context of her life and in her 'projections of family biographies' (Tulloch and Lupton 2003: 107) via her children. For Grace, making the decision to mitigate again is not a simple calculation based on current flood risk. Rather, it needs to be reconciled with her previous financial efforts to do so and her felt financial obligations going forward. A few streets over, Trish also sought to mitigate her personal flood risk through home elevation, but she ran out of money for the job and could not get a second mortgage to finance its completion, leaving her family indefinitely

physically and economically insecure: ‘I do things to protect myself,’ but ‘We’re struggling now. Going into debt, at 52 [years old], is not where I wanted to be’ (Interview, 21 October 2014). The decision to address flood risk might be framed as prudent in the long term, but residents had to manage immediate economic problems. Following through on mitigation and realizing its rewards is a protracted process, which can introduce economic uncertainties that families will have to manage for unknown stretches of time. Grace and Trish had survived the flood; they had repaired their homes, at least to a livable standard. For them, it was the map that presented an economic threat now that the waters had receded. The map, and the risk-based insurance premiums it made possible, might work to reduce flood risk across the city, but like other risk-reduction strategies, it could increase exposure to other risks for the residents therein (Gotham 2016).

Exposure to new kinds of economic risk was familiar to Meg, a legal aid attorney in Staten Island, who showed me a list of reasons that her clients were refusing elevations. For many, there simply was no money for it. Even when the construction itself was funded partially or entirely by the City’s Build It Back program, many clients could not afford temporary rent (often in addition to a mortgage payment) to bridge the time that they would be displaced from their homes during construction. Like Grace and Trish, many of Meg’s clients felt overwhelmed by the prospect of undertaking a lengthy mitigation project: ‘One [thing] we hear a lot is: I’m just exhausted. I’m too tired; don’t talk to me about this. I’m done. It’s over’ (Interview, 23 October 2014). Scott, an insurance broker who sells NFIP policies, had experienced the same thing: ‘The biggest reason people aren’t doing [elevation], believe it or not, is they’re beaten down. They’re beaten. They’ve had enough… I get it.’ (Interview, 18 March 2014). In the wake of the storm, as many were calling for smarter rebuilding and land use, professionals like Meg and Scott, who interacted with homeowners facing tough choices, said that people were not in denial of the flood risk. Rather, it was that

though the end result of risk mitigation might be financially desirable, the time it would take to get there was indeterminate but anticipated to be long, generating or intensifying economic risks that were difficult to bear.

The map also provoked discussion of political risks surrounding flood insurance, which had in the past, and could again at an unknown point in the future, lead to unpredictable changes to the map or to the program more generally, thereby changing the economic situation on the ground, even in the absence of further flooding. All insurance systems are politically determined (Baker and Simon 2002; Ericson, Barry, and Doyle 2003) but U.S. flood insurance, as a public, federal program, is conspicuously shaped by shifting political priorities, funding schedules, and reform agendas (Knowles and Kunreuther 2014). The NFIP as a whole has to be reauthorized by Congress every five years, which means the regulatory arrangements for mapping and pricing flood risk can and do change, often setting off further local changes to land use, building code, and zoning regulations. In addition, flood risk is itself dynamic, changing due to climatic conditions, as well as further real estate development, increasing population density, and other changes to an area's topography (Collins 2009). As a result, producing 'accurate' flood maps that can be used to define the 'true cost' of the risk and the 'value at risk' requires regular updates to assimilate new data and developments in risk science and technology. In successive map updates, the lines that delimit the high-risk flood zones may move; the base flood elevation may go up or down. Through a formal 'appeals' process, local communities can contest these changes on the basis of their own data and technical assessments, and many do (Elliott and Rush 2017). Government engineers and officials treat the task of mapping flood risk as one of technical and objective risk definition. But for local communities, trust in scientific and political institutions is also relevant to the 'frame of reference' through which people interpret and act on risk (Wynne 1992).

These political risks of the NFIP, familiar from past experience with the program and an anticipated feature of its future existence, introduced an additional factor complicating the decision of not just when, but also whether or how to mitigate risk. Sophia's house in Broad Channel was completely destroyed in Hurricane Sandy. She planned to rebuild at higher elevation. However, 'if the federal government can come in and say, OK, you built to code in 2014, but now it's 2025, and you're no longer up to code—then what? They're going to keep changing the rules of the game mid-way?' (Interview, 26 February 2014). Sophia knew those rules could change further, or change back, at the next NFIP reauthorization, map update, or sooner. At a flood insurance help desk in Staten Island, a housing counselor described the situation to me:

> 'We know flood insurance is going to go up… the question is, is it 15 per cent, is it 18 per cent, is it 25 per cent? … What are people to do? … They're facing flood insurance rate increases very, very quickly, and most people in this community are on the margins of being able to pay their mortgage… Homeowners have an enormous amount of distrust in government, and the government hasn't helped their case any, with all the promises, and broken promises, and when things are going to happen' (Field notes, 21 March 2014).

Based on the consultations he had done, he said: 'I wouldn't say people flat-out don't want to elevate.' Instead, they seemed to want to 'wait and see' if the changes to the map and insurance rates would last. New York City's new map was a political artifact that would take years to be formally adopted and go into regulatory effect. Dave, a Rockaway resident, summarized, with some exasperation, the questions about the changing map that local residents put to FEMA officials at a civic association meeting in the winter of 2013:

> 'You're telling me my house, where it's sitting, the way our area is configurating, that I'm in the most vulnerable flood zone, therefore my insurance is X, Y, Z. But if these

> resiliency measures are taken, does that, is that taken into account, and does that move me out of the floodplain, or does it affect my insurance? At that time, the answer was, "I don't know," I believe, at that meeting, because nobody was thinking that far ahead' (Interview, 31 October 2014).

Residents wanted to know if, in the near future, the city invested in structural flood protection or other community-wide flood risk mitigation, they would each see reductions to their flood insurance that would protect their property values and prevent them from having to take on expensive personal mitigation projects or consider relocating now. The terms of assessing, pricing, and distributing flood risk would always be in some respects politically tentative, subject to tweaking or wholesale reimagination at unpredictable junctures over the near and long term. Preparedness for the future implied not simply a response to intensifying flood risk, but also some ability to absorb the vagaries of political processes that might repeatedly change the rules, and the resulting costs and property values, over time. Users of the map understood the situation on the ground as dependent not just on changing flood risk, but on larger political and regulatory forces, which can breed 'complex resentments and frustrations' (Henwood, et al. 2008: 433).

The Comptroller's report also confidently connected the new flood map to climate change adaptation that would protect the financial value at risk in the city. But for users on the ground, the new map and insurance prices were an ambiguous and politically contentious signal of how 'near' or 'far' climate change might in fact be (Norgaard 2011). From a technical standpoint, the map did not formally 'account for' already occurring or future climate change, or even for the flooding from Hurricane Sandy. It was based on historical data of previous flood events, not on projections of future sea level rise or storms to come.[3] Yet sea levels had already risen in the region (Miller, et al. 2013) and, with the recent

[3] FEMA, through a reconvened Technical Mapping Advisory Council, is currently mandated to incorporate climate science and sea level rise projections into its flood map products.

experience of Sandy, New Yorkers debated whether the map was indeed reflecting local effects of climate change. Dave from Rockaway described the new map as a 'fantastic Exhibit A for climate change':

> 'I think that, just from the changing, the amount of homes in flood zones has at least doubled. And that tells you something—and that's not out of preparedness—it's a reaction to what happened… I think that it's a very real thing now, and I think that people here are very keenly aware of that' (Interview, 31 October 2014).

But Meg, the legal aid attorney, was uncertain about whether to make flood insurance 'a climate change issue' in her work with clients:

> 'That has been such a volatile issue, that I don't want to associate anything I'm saying about flood insurance increases and what you need to do with something that some people may consider still fiction. Because this is not fiction—whether you believe that or not, [flood insurance] is reality. I know the City is trying to talk about it a lot that way, and [New York] Governor Cuomo came out strongly about that, and that's great. But for me, we've got all these hurdles of credibility to overcome. So I don't mention climate change. But we do hear people in the community on either side of that. Some who are saying, look, this is climate change, and we've got to deal with what we've got to deal with, and others who say, hell with it' (Interview, 23 October 2014).

Amy, an insurance consumer advocate whose organization assisted policyholders in the wake of Sandy, said she knew 'rising water is going to wipe things out.' Yet she said she had trouble figuring out, 'where should my organization be?':

> 'I figured out early on, there was a bit of a schizophrenic problem here. Like I could be lockstep with my environmental colleagues in saying, don't allow new construction, don't allow new construction. But how do you say to someone who's been living—the firefighter—how do you say to them, "I'm sorry"… But see, you can

> hear how my focus keeps coming back to wanting people to be able to have insurance, which is not a radical—the radical thing is, "Don't let them live there." And I can't be there, because my constituency is the people who are trying to live their lives, and they don't know from rising sea levels, they just know I've got to drive my kid to school, I've got to get to work, you know?' (Interview, 18 November 2013).

Amy does not know if she should interpret the new map as grounds for urging homeowners, even if they can make it work financially today, to move out of harm's way given a potentially riskier (and more expensive) future. As Meg indicated, though the city and state governments connected the new map and insurance premiums to rising sea levels and climate change, map users on the ground grappled with how or whether to factor climate change into planning for next month's mortgage payments, next year's insurance renewal, or the next property sale. As Tulloch and Lupton (2003) found in their study of risk biographies, people grapple with a not yet/no longer temporality in the context of their own lives—in this case, an ambiguous temporality connected to the flood map. The city was *not yet* facing climate change risk that made its waterfront entirely physically or financially uninhabitable. But at the same time, the changing picture of risk on the map suggested the city's waterfront communities were *no longer* as safe or economically viable as they once were.

In delivering new information about current flood risk, the flood map generated and exposed other kinds of risks relevant to local understandings of past, present, and future. For many, the map did not make flood the central thing they felt 'at risk' from, so much as the economic risks attendant on mitigating their exposure over the short and long term, or the political risks of historically precarious institutional arrangements. The map also raised questions about the present and future of climate change risk, and when the costs of insurance would be too high to bear. In the face of these plural risks, unfolding along multiple

timelines, residents had to make a decision today or soon. For residents like Trish and Sophia, who responded ostensibly rationally to the changing economization of flood risk, the relevance of these other risks to their personal situations made them feel less rather than more secure. Through their interactions with residents, engineering, insurance, legal, and housing experts also understood these multiple risks as relevant to what they would advise and when. The map's specification of current flood risk created an ambivalence from being caught between the rationality of flood risk mitigation and other reasons to 'wait and see.'

Multiple values of and toward place

Through economizing risk, flood insurance makes a physical risk financially consequential, in the New York City context generating the hardships and uncertainties described above. However, for users on the ground, the stakes of the map were, at the same time, about more than the threatened financial value of places in the flood zones. The map also threatened shared values of fairness and equity, that is, what those places were owed or entitled to, as users contemplated how insurance-driven flood risk reduction would transform the communities subjected to it. In raising the possibility that some communities already are or soon will be effectively financially uninhabitable, the map also threatened the social and emotional value imbued in places.

The zones on the flood map designated places—entire neighborhoods—as newly or more intensely risky, prompting questions not only about shared fates but also about collective responsibility. Beau, a flood map engineer who worked on the region's maps, suggested that individual mitigation should be 'one piece' of a broader effort to make entire communities more resilient, justified in part by the collective failures that had put people in the floodplain to begin with:

> 'Those people are at huge risk… And obviously I can't tell people to get out of their house. And that will be unfair because as I say, for them it's catch-22, and we as a

> society put them there, partially. So we have to find a way out, but it's not only the insurance rates. That's one piece of the whole puzzle, of mitigation options, approaches, and basically being able to help those communities, the whole society, not to be constantly on the hook for billions of losses after every single flood event' (14 October 2013).

Though the map made the problem of property at risk one for the local community, Beau acknowledged that 'we as a society put them there.' Weak land use enforcement in the past implied a broader sharing of financial responsibility for that risk today as a matter of fairness to those places now facing such high risk. Scott, the insurance broker, also thought that responsibility ought to be distributed differently: 'It's maybe time to look at [flooding] and look at the causes. Now, where do I think the funding should come from? Everybody who's contributing to global warming—forget the cap and trade—tax the bastards and have them pay for all this' (18 March 2014). For Beau and Scott, the map highlighted the contradiction between a collectively produced but locally emplaced financial burden. The flood risk was what it was, but the value of fairness shaped their understandings of how its economic consequences, enacted through the flood map, ought to be managed.

The flood zones on the map also overlaid existing spatialized socio-economic differences reflected in the geography of the city, generating tensions around equity. More affluent communities, in New York City and nationwide, can better absorb higher household costs and protect their own property values as intensifying flood risk is reflected on new flood maps. If New York City maintains development on its waterfront, who will ultimately live in redeveloped, more flood resilient places is an open question. After Sandy, some homeowners whose houses were or would soon be financially underwater had the option of letting the city acquire their land through Build It Back—which it could then redevelop. Meg, the legal aid attorney, said professionals in her world 'have a real concern that what's going

to happen is they're going to be redeveloped for wealthy people.' She pointed out that using financial value as a lever to incentivize redevelopment did not come with a 'right of return for all those people who have already been pushed out' (Interview, 23 October 2014). With lower property values, residents who sold homes they could no longer afford to insure, or that would not sell for a return, might not be able to find affordable housing elsewhere in this very expensive city.

Residents registered concern about equity, as well; in the words of Grace in Broad Channel:

> 'They would take this entire community, level it, and sell it to the one per cent, the two per cent of the population that make a hell of a lot more money than I could ever dream of. They'd put up houses here, or condos, sell them at two or three million dollars apiece, but meanwhile, the regular Joe Shmoes out there, they're making 50,000 dollars a year… Are they going to turn around and say that the Hamptons… are they going to tell them that *they* can't rebuild their neighborhood? I sincerely, with my heart of hearts, do not believe that' (Interview, 26 February 2014).

Her neighborhood might be a risky place to live, but so was the Hamptons on the coast of nearby Long Island, where the rich and famous kept their summer homes. Though from a technical standpoint, the map treated every place 'equally,' subjecting it to the same risk assessment as any place else, poorer places would experience these options as a threat to their continued existence and the pressures of insurance would heighten spatially uneven economic well-being in the city and region. As Curran (2013) notes, class inequalities mean that the burdens of risk exposure, visualized on the map, and adaptation, incentivized through assessing the 'value at risk', will be unequally felt. These distributional effects on more versus less affluent places undermined the legitimacy of the map's ostensible purpose of helping to protect at-risk places.

The new map also imperiled the emotional and social values attached to place. It narrated parts of the city as risky, perhaps too risky—and too expensive—for some communities to remain intact. Some residents might be able to elevate their homes in place, but some would have to move on. This was an existential threat, subjectively and materially disrupting connections to emplaced identities, social relations and networks, collective experiences, and ways of life. A New York state assembly representative for Rockaway described it as 'a brick to the head' (Interview, 21 March 2014); his constituents were trying to wrap their minds around whether or for how long they should defend their flood zone homes and communities. When I asked Dan in Broad Channel if the new map might lead him and his neighbors to move, he replied: 'You're wasting your breath… we're never going to move away.' He described Broad Channel:

> 'This is working class families… The people who live here are the people who pick up your garbage; they teach your kids; they keep you safe from criminals; and they run into burning buildings. That's who lives here… There's a sense of community down here that's existed since the 20s, and after the storm, this town had the first resource center up, two nights after the storm… We have a sense of community that I think is very strong, and something that is admirable, and something that the country's always sought to support' (Interview, 22 October 2013).

Dan described a 'place character' that was threatened by the rising price of flood risk and that he vowed to defend (Molotch, Freudenberg, and Paulson 2000; Devine-Wright 2013). While they may not be sufficiently flood-resilient, they were socially resilient, able to get organized in the face of the storm's devastation, a point of pride. As Henwood, et al. (2008) note, the 'riskiness' of a place can be experienced as a kind of stigmatization, which local residents resent and resist when it threatens their emotional and social attachments to place. Trish, choking up as she spoke, said, 'Living on the water, we saw the change.' She was not in

denial; she believed what the map was showing her about her community. ‘Sure, you can walk away,’ she said. ‘But I, I don’t want to. I’m not ready’ (Interview, 21 October 2014). Places have multiple values, made by the similarly plural investments of their inhabitants over time; emotional and social investments necessarily comingle with financial ones (Henwood, et al. 2008; Becher 2014; Dunn 2013). For New Yorkers, this complicated any rational calculation of the costs—explicit or otherwise—of staying as is, mitigating the risk, or relocating elsewhere.

The emotional and social value of threatened places also resonated with experts and local officials. A city official who works on flood insurance issues said, ‘It’s about their home, the place they love to live’ (Interview, 4 March 2014). At a Staten Island flood insurance help desk, in between consultations with homeowners, a city planner mused to colleagues:

> ‘There’s something kind of beautiful about the neighborhoods in these areas that are not going to exist in 50 years, who feel such a strong connection to place, that they don’t want to go anywhere. You can look them in the eye and tell them it won’t be there in 50 years, and they’ll say, ‘OK, but until then…’ There’s something kind of beautiful about that’ (Field notes, 21 March 2014).

He could understand delaying or rejecting the push toward risk reduction as deriving from an intelligible affection for and desire to protect cherished places.

The flood map did not simply or unproblematically measure financial value at risk; rather, it put multiple values ‘at risk.’ Values of fairness and equity, along with the emotional and social value of places, shaped attitudes toward what to do about the financial value at risk, enlarging the stakes of what needed protecting.

Conclusion

By getting underneath the procedural rationality of the NFIP's flood insurance rate map and situating it in time and place, the findings here empirically complicate conventional deployments of 'value at risk'. The remapping and repricing of flood risk was meant to change understandings of the landscape. The city and FEMA pushed new information about value at risk in the hope and expectation that it would change behaviour. And it did, for many New Yorkers. Some residents did mitigate their property-level risk or relocate. Officials and experts did their jobs, helping residents to make the kinds of financial calculations that would have bearing on their short- and long-term futures. The empirical story here does not show that the technology of flood insurance fails to produce the kinds of effects it is designed to produce, as in fact both the policymakers and economists who design this public policy, as well as more critical insurance scholars working in a Foucauldian tradition, would emphasize. Yet however 'rational' the ultimate outcome, the experience of living at and responding to flood risk, as mediated by flood insurance, involves situating oneself along multiple timelines over which a variety of perceived risks might unfold and recast the decision. It also involves contemplation of commitments to values of fairness and equity vis-à-vis threatened places, which shape judgments of what is a right or good course of action in dealing with the problem of flood risk and its cost. Emotional and social values 'rooted in the connections…built up over time between person and place' (Henwood, et al. 2008: 433) also constitute the worth attributed to places and, when those values are put 'at risk', they inform the individual and collective outcomes that seem acceptable.

It is not simply that the flood insurance rate map as a technology cannot bracket out these considerations; the map itself provokes them, seeming to make the map the problem, rather than the threat of flooding it depicts. Even when people take steps to mitigate their flood risk, they may not feel that they are in fact 'better off'. When they have to contend with flood risk as an immediate economic cost, they may feel and be simultaneously more and less

secure, more and less resilient. Even when experts and officials do their jobs, they may feel the policy and the situations facing residents are in themselves unfair. This is illustrative of the often 'conflictual and contradictory nature of risk-reduction' (Gotham 2016: 790). Diagnosing conflicts and contradictions in other contexts in which risks are governed through their economization can clarify whether, how, when, and with what results risk reducing action is taken. Given a particular constellation of risks and values, it may indeed seem better not to protect yourself against flooding (Harries 2008, 2012), at least for a time, as lawyers and housing counselors discovered in their work with residents who were refusing home elevations, even partially financed ones. Homeowners may refuse to purchase increasingly expensive flood insurance if they can evade the mandatory purchase requirement, leaving them financially exposed when the next flood hits. As Wynne (1992) notes, publics respond to threats they perceive coming from the risk *discourses* imposed by expert and political institutions, rather than or in addition to the underlying hazard itself. This can explain why communities around the country—including, eventually, New York City in June 2015—often mobilize to fight the 'accuracy' of flood maps or insurance rates in order to move the boundaries of the flood zones or lower the price of insurance (Elliott 2017; Elliott and Rush 2017). This effort does not necessarily reflect 'naïve expectations of zero risk' (Wynne 1992: 282); recall that 86 per cent of New York survey respondents believed they lived in a high flood risk area (Botzen, Kunreuther, and Michel-Kerjan 2014). Rather, communities seek to protect what is valued—property, but also cherished connections, fairness—not only from the flood, but from the flood map. They can do so on the basis of new collective political identities created by the map itself, like 'flood zone homeowners' (Elliott 2017). Public interactions with risk technologies thus provide a site for connecting debates around obligation and responsibility to risk politics (Bulkeley 2001; Bickerstaff, Simmons and Pidgeon 2008). Though meant to motivate confident, informed action, using insurance

technology to depict and communicate ‘value at risk’ exposes the presence of interacting, plural values and risks relevant to the steps taken today, only some of which might have to do with mitigating the natural hazard risk itself in preparation for a potentially watery future. This suggests that in the face of increasing calls for individuals and communities to (re)build ‘smarter’, policies and programs need to address the broader mix of factors that shape how the pressures to do so are experienced and interpreted (Adger, et al. 2013).

I have argued that socio-cultural risk research should bring its interpretive approach to bear on insurance. This then requires examining the particular experience of environmental risks that are not just visualized on maps, communicated by experts, or discussed in the media, but are also economized, thereby becoming financially ‘real’ for individuals and local communities. Doing so is particularly important given the increasing appearance of climate change adaptation efforts that depend upon these kinds of risk-economizing interventions (Webb 2012). This is not to say that risk experiences and orientations can be reduced to ‘nothing but’ economic interest, as some political economies of risk seem to suggest. Indeed, I have shown that the implicated values and risks in some sense exceed the narrow temporal and spatial parameters—both financial and physical—the flood map specifies as ‘relevant’ to guiding action. Rather, the analysis demonstrates that, as Gotham (2016) notes, the local contexts in which risk reduction interventions take place, and in which people create meaningful lives, are at once ‘material and symbolic’ (801). Residential places are commodified such that, when mediated by insurance, flood risk is necessarily and simultaneously a matter of economic consideration. This was reflected in New York City through local meanings and experiences of risk that connected flood maps to economic strain. It was also reflected in the concerns raised about fairness and equity, which related to how financial responsibility ought to be distributed and to how the threat to property values would interact with existing economic inequalities. Yet at the same time, it is not simply property

value that drives orientations to flood risk or flood maps; residential places have 'meaning and significance for people and they act, sometimes passionately, on that meaning' (Logan and Molotch 1987: 102). In sum, through changing official landscapes of risk and value, insurance generates material consequences, which are experienced and interpreted in a broader context of risks and values that may lead its particular logic of incentivized risk reduction to break down when put to the test on the ground.

The particular values and risks implicated in New York City are to some extent necessarily specific to it at this moment in its history, with its specific socio-spatial patterns of habitation. However, when applied to other empirical cases in which 'value at risk' is deployed to motivate risk-reducing action, the analysis undertaken here can be encapsulated as an inquiry into *values* at risk. This extends socio-cultural risk research's openness to multiple meanings of risk in order to inform analyses by thematizing a more pluralistic operationalization of value and the forms it can take, which can in turn clarify our assessments of local understandings of, and strategies for addressing, environmental risks. Where insurance is used to mediate environmental risks, sociologists can focus on the operations of its central risk technologies to elucidate what values are at stake, financially and otherwise, for local communities who have to use these technologies to make decisions and plan for the future. For instance, we would expect this to yield different relevant values and risks in areas more affluent than the outer boroughs of New York City, i.e. places where much of the housing stock may be vacation homes and the material resources of those affected are not so precarious. However, vacation homeowners might still also feel a keen sense of loss of an emotionally or socially valued place. They might also feel unsure of how to situate their own decisions vis-à-vis climate change risk. But they might be thinking about investments, or inheritances for their children, rather than about next month's mortgage payments. We can also examine 'values at risk' to address questions about the challenges

facing renters or public housing residents, who do not experience a direct threat to the 'exchange value' of property, but may indeed feel other values threatened as policy changes are made in response to new visualizations and economizations of risky areas on flood maps. Future research might also address how configurations of value and risk manifest differently or are reconciled in cases where communities desire and mobilize for relocation away from risky areas, such as community-led buyout efforts (Koslov 2016) and housing relocation (Ziederman 2016).

New York City has undergone changes that are being visited upon floodplains around the U.S. and the world. In the wake of several recent catastrophic floods, the UK Environment Agency is also redrawing its flood maps, with implications for residents' insurance costs and property values (Rudgard 2016). If and when climate change impacts intensify, fates will be determined by some combination of physical transformation to the landscape and the insurance mediation of changing risks, some combination of being physically and financially underwater. I have shown that providing more information about value and risk does not necessarily generate empowered decision-makers who stand to benefit from moves toward 'resilience', but instead generates ambivalent outcomes and actors. For scholars interested in how the economization of changing risks unfolds in social life, attention to 'values at risk' can clarify the uneven, fitful nature of our attempts to keep our heads above water.

References

Adger, W.N., Barnett, J., Brown, K., Marshall, N. and O'Brien, K. 2013, 'Cultural Dimensions of Climate Change Impacts and Adaptation', *Nature Climate Change* 3: 112-17.

Aerts, J.C.J.H., Botzen, W.J.W., Emanuel, K., Lin, N., de Moel, H., and Michel-Kerjan, E.O. 2014 'Evaluating Flood Resilience Strategies for Coastal Megacities', *Science* 344(6183): 473-5.

Baker, T. and Simon, J. 2002 *Embracing Risk: The Changing Culture of Insurance and Responsibility,* Chicago: University of Chicago Press.

Baxter, J. and Lee, D. 2004 'Explaining the Maintenance of Low Concern Near a Hazardous Waste Treatment Facility', *Journal of Risk Research* 7: 705–29.

Becher, D. 2014 *Private Property and Public Power: Eminent Domain in Philadelphia,* New York: Oxford University Press.

Beck, U. 1992 *Risk Society: Towards a New Modernity,* London: Sage.

Beck, U. 1999 *World Risk Society,* Cambridge, UK: Polity Press.

Beckert, J. and Aspers, P. 2011 *The Worth of Goods: Valuation and Pricing in the Economy,* New York: Oxford University Press.

Bickerstaff, K., Simmons, P. and Pidgeon, N. 2008 'Constructing Responsibilities for Risk: Negotiating Citizen-State Relationships', *Environment and Planning A* 40: 1312-33.

Bickerstaff, K. and Walker, G. 2001 'Public Understandings of Air Pollution: The 'Localisation' of Environmental Risk', *Global Environmental Change* 11(2): 133-45.

Botzen, W., Kunreuther, H. and Michel-Kerjan, E.O. 2014 'Understanding Individual Flood Risk Perceptions and Flood Insurance Choices to Build More Resilient Communities: A Survey of New York City Residents', *Issue Brief: Informed Decisions on Catastrophe Risks.* Philadelphia, PA: Wharton Risk Center.

Bulkeley, H. 2001. 'Governing Climate Change: The Politics of Risk Society?' *Transactions of the Institute of British Geographers* 26(4): 430–447.

City of New York. 2011 *PlaNYC: A Greener, Greater New York,* New York, NY.

City Of New York. 2013 *PlaNYC: A Stronger, More Resilient New York,* New York, NY.

Collier, S.J. 2014 'Neoliberalism and Natural Disaster: Insurance as a Political Technology of Catastrophe', *Journal of Cultural Economy* 7(3): 273-90.

Collins, T.W. 2009 'The Production of Unequal Risk in Hazardscapes: An Explanatory Frame Applied to Disaster at the US–Mexico Border', *Geoforum* 40(4): 589–601.

Committee on the Affordability of National Flood Insurance Program Premiums. 2015 *Affordability of National Flood Insurance Program Premiums: Report 1*, Washington, D.C.: National Academies Press.

Curran, D. 2013 'Risk Society and the Distribution of Bads: Theorizing Class in the Risk Society', *The British Journal of Sociology* 64(1): 44-62.

Dake, K. 1992 'Myths of Nature: Culture and the Social Construction of Risk', *Journal of Social Issues* 48(4): 21-37.

Department of City Planning. 2014 *Coastal Climate Resiliency: Retrofitting Buildings for Flood Risk*, New York City: Department of City Planning.

Desmond, M. 2014 'Relational Ethnography', *Theory and Society* 43: 547-79.

Devine-Wright, P. 2013 'Think Global, Act Local? The Relevance of Place Attachments and Place Identities in a Climate Changed World', *Global Environmental Change* 23: 61-9.

Dixon, L., Clancy, N., Miller, B.M., Hoegberg, S., Lewis, M.M., Bender, B., Ebinger, S., Hodges, M., Syck, G.M., Nagy, C., and Choquette, S.R. 2017 *The Cost and Affordability of Flood Insurance in New York City*, RAND Corporation.

Douglas, M. 1992 *Risk and Blame: Essays in Cultural Theory*, London: Routledge.

Douglas, M. and Wildavsky, A. 1982 *Risk and Culture: An Essay in the Selection and Interpretation of Technological and Environmental Dangers*, Berkeley, CA: University of California Press.

Dunn, J.R. 2013 'Security, Meaning, and the Home', in P.A. Hall and M. Lamont (eds.) *Social Resilience in the Neoliberal Era,* Cambridge, UK: Cambridge University Press, 183-205.

Eiser, J.R., van der Pligt, J. and Spears, R. 1995 *Nuclear Neighbourhoods: Community Responses to Reactor Siting,* Exeter: University of Exeter Press.

Elliott, R. 2017 'Who Pays for the Next Wave: The American Welfare State and Responsibility for Flood Risk', *Politics & Society* 45(3): 415-40.

Elliott, R. and Rush, E. 2017 'Stormy Waters: The Fight Over New York City's Flood Lines', *Harper's Monthly,* June.

Ericson, R., Doyle, A. and Barry, D. 2003 *Insurance as Governance,* Toronto: University of Toronto Press.

Fourcade, M. 2011 'Cents and Sensibility: Economic Valuation and the Nature of "Nature"', *American Journal of Sociology* 116(6): 1721-77.

Giddens, A. 1990 *The Consequences of Modernity,* Stanford, CA: Stanford University Press.

Gotham, K.F. 2016 'Coastal Restoration as Contested Terrain: Climate Change and the Political Economy of Risk Reduction in Louisiana', *Sociological Forum* 31(S1): 787-806.

Harries, T. 2008 'Feeling Secure or Being Secure? Why It Can Seem Better Not to Protect Yourself Against a Natural Hazard', *Health, Risk & Society* 10(5): 479-90.

Harries, T. 2012 'The Anticipated Emotional Consequences of Adaptive Behaviour--Impacts on the Take-Up of Household Flood-Protection Measures', *Environment and Planning A* 44: 649–68.

Henwood, K. Pidgeon, N., Sarre, S., Simmons, P. and Smith, N. 2008 'Risk, Framing and Everyday Life: Epistemological and Methodological Reflections from Three Socio-Cultural Projects', *Health, Risk & Society* 10(5): 421-38.

Henwood, K., Pidgeon, N., Parkhill, K., and Simmons, P. 2011 'Researching Risk: Narrative, Biography, Subjectivity', *Historical Social Research* 36(4): 251-72.

Hilgartner, S. 1992 'The Social Construction of Risk Objects' in J. Short and L. Clarke (eds.) *Organizations, Uncertainty and Risk*, Oxford, UK: Westview Press, 39–53.

Hutter, B. 2010 *Anticipating Risks and Organising Risk Regulation,* Cambridge, UK: Cambridge University Press.

Irwin, A., Simmons, P., and Walker, G. 1999 'Faulty Environments and Risk Reasoning: The Local Understanding of Industrial Hazards', *Environment and Planning A* 31: 1311-26.

Irwin, A. and Wynne, B. (eds.) 1996 *Misunderstanding Science? The Public Reconstruction of Science and Technology,* Cambridge, UK: Cambridge University Press.

Johnson, L. 2013 'Index insurance and the articulation of risk-bearing subjects', *Environment and Planning A* 45: 2663–81.

Knowles, S.G. and Kunreuther, H.C. 2014 'Troubled Waters: The National Flood Insurance Program in Historical Perspective', *Journal of Policy History* 26: 327-53.

Koslov, L. 2016 'The Case for Retreat', *Public Culture* 28(2): 359-87.

Lakoff, A. and Klinenberg, E. 2010 'Of risk and pork: urban security and the politics of objectivity', *Theory and Society* 39: 503-25.

Lane, S.N., Landström, C. and Whatmore, S.J. 2011 'Imagining Flood Futures: Risk Assessment and Management in Practice', *Philosophical Transactions of the Royal Society A* 369: 1784–1806.

Lamont, M. and White, P. 2007 *Workshop on Interdisciplinary Standards for Systematic Qualitative Research,* Washington, D.C.: National Science Foundation.

Logan, J. and Molotch, H. 1987 *Urban Fortunes: The Political Economy of Place,* Berkeley, CA: University of California Press.

Lupton, D. 2013 ‘Risk and Emotion: Towards an Alternative Theoretical Perspective’, *Health, Risk & Society* 15(8): 634-47.

Masuda, J.R. and Garvin, T. 2006 ‘Place, Culture, and the Social Amplification of Risk’, *Risk Analysis* 26: 437–54.

Miller, K. G., Kopp, R.E., Horton, B.P., Browning, J.V. and Kemp, A.C. 2013 ‘A Geological Perspective on Sea-Level Rise and its Impacts Along the U.S. Mid-Atlantic Coast’, *Earth's Future* 1: 3–18.

Molotch, H., Freudenburg, W. and Paulson, K. 2000 ‘History Repeats Itself, But How? City Character, Urban Tradition, and the Accomplishment of Place’, *American Sociological Review* 65(6): 791-823.

Norgaard, K.M. 2011 *Living in Denial: Climate Change, Emotions, and Everyday Life,* Cambridge, MA: MIT Press.

O’Malley, P. 1996 ‘Risk and Responsibility’ in A. Barry, T. Osborne, and N. Rose (eds.) *Foucault and Political Reason: Liberalism, Neo-liberalism and Rationalities of Government,* London: University College London Press, 189-207.

O’Malley, P. 2004 *Risk, Uncertainty and Government,* London: The Glass House Press.

Parkhill, K.A., Pidgeon, N.F., Henwood, K.L., Simmons, P. and Venables, D. 2010 ‘From the Familiar to the Extraordinary: Local Residents’ Perceptions of Risk When Living with Nuclear Power in the UK’, *Transactions of the Institute of British Geographers* 35(1): 39-58.

Parkhill, K.A., Pidgeon, N.F., Henwood, K.L., Simmons, P. 2011 ‘Laughing it off? Humour, Affect And Emotion Work In Communities Living With Nuclear Risk’, *British Journal of Sociology* 62(2): 324-46.

Perrow, C. 1984 *Normal Accidents: Living With High Risk Technologies*. New York: Basic Books.

Pidgeon, N.F., Simmons, P. and Henwood, K.L. 2006 'Risk, Environment and Technology' in P. Taylor-Gooby and J. Zinn (eds.) *Risk in Social Science*, Oxford: Oxford University Press, 94–116.

Porter, J. and Demeritt, D. 2012 'Flood-Risk Management, Mapping, and Planning: The Institutional Politics of Decision Support in England', *Environment and Planning A* 44: 2359-78.

Power, M. 2004 *The Risk Management of Everything: Rethinking the Politics of Uncertainty*, DEMOS: London.

Rothstein, H. Huber, M. and Gaskell, G. 2006 'A Theory of Risk Colonization: The Spiraling Regulatory Logics of Societal and Institutional Risk', *Economy & Society* 35(1): 91-112.

Rudgard, O. 2016 'Will the redrawing of flood maps affect your house and insurance?', *The Telegraph*, January 18.

Shaw, A. 2013 'How Well Did FEMA's Maps Predict Sandy's Flooding', *ProPublica*, December 6.

Simon, J. 1988 'The ideological effects of actuarial practices', *Law and Society Review* 22: 771–800.

Stringer, S. 2014 'On the Frontlines: $129 Billion in Property at Risk from Flood Waters', New York City: Office of the New York City Comptroller, Bureau of Policy and Research.

Tulloch, J. and Lupton, D. 2003 *Risk and Everyday Life*, London: SAGE.

Webb, J. 2011 'Making Climate Change Governable: The Case of the UK Climate Change Risk Assessment and Adaptation Planning', *Science and Public Policy* 38(4): 279-92.

Webb, J. 2012 'Climate Change and Society: The Chimera of Behaviour Change Technologies', *Sociology* 46(1): 109-25.

Wetmore, J.M. 2007 ‘Distributing Risks and Responsibilities: Flood Hazard Mitigation in New Orleans’, *Social Studies of Science* 37(1): 119-26.

Wilkinson, I. 2001 ‘Social Theories of Risk Perception: At Once Indispensable and Insufficient’, *Current Sociology* 49(1): 1-22.

Wynne, B. 1992 ‘Risk and Social Learning: Reification to Engagement’, in S. Krimsky and D. Golding (eds.) *Social Theories of Risk,* London: Praeger, 275-97.

Zeiderman, A. 2016 *Endangered City.* Durham, NC: Duke University Press.