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Organizing for climate adaptation: Competing visions in Boston

Nichole Wissman-Weber and David L. Levy

Climate impacts have significant economic, social, and environmental consequences for cities to consider (Adger et al. 2005). In 2020 alone, climate-related disasters such as the droughts in East Africa, South Asian floods, and wildfires in Australia and the American West cost billions of dollars and brought immense suffering. This shifting environment, which is creating new, difficult-to-manage risks (Beck 2009), has been designated the Anthropocene (Steffen et al. 2007) – a new epoch characterized by human impacts on the climate and biodiversity loss (Clark 2014). The Anthropocene concept is shifting our collective understanding and response to environmental changes, which in turn generate material changes to the urban and natural environments (Gephardt Jr et al. 2009; Johnson et al. 2014; White et al. 2015).

The Anthropocene thus raises questions regarding how organizations, institutions, markets, and governance structures adapt. Although environmental problems are frequently framed as narrow managerial-technical problems amenable to simple solutions, the Anthropocene provides “the opportunity for a re-politicisation of environmental challenges” and to explore “many futures – imaginaries about worlds that would be good to live in and ways of reaching them” (Lidskog and Waterton 2016, 399). This exploration questions the path of continu-

ous economic growth, casts doubt on optimistic renditions of scientific progress, and probes the power relations vested in structures for defining, managing, and distributing risk (Beck 2009; Cable et al. 2008).

Contending with climate change through adaptation Coastal cities in the northeastern US began planning in earnest for climate adaptation following Hurricane Sandy in 2012, which caused widespread death and economic losses and was linked to climate change by the scientific community and the mass media (Trenberth et al. 2015). These cities are leading the way because they have substantial assets at risk and possess the administrative capacity and resources to engage in adaptation (see Shi et al. 2015). The media have struggled to convey the unprecedented size and intensity of the storm systems, the record rainfall and flooding in Houston, and the scale of devastation in Puerto Rico.

Most cities are in the early stages of planning: they are establishing initiatives, such as Climate Ready Boston (CRB), to assess and model likely physical impacts; estimate future costs under various scenarios; conduct cost-benefit analyses of adaptation measures; and explore financing mechanisms. They are forging local networks of stakeholders that include government agencies at multiple levels, community groups, and the private sector – primarily property developers, insurance companies, and consultants (Adger et

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al. 2009; Anguelovski and Carmin 2011). Adaptation measures under consideration vary across temporal and spatial scales, ranging from multibillion-dollar harbor protection schemes to smaller-scale projects to protect neighborhoods and changes to zoning and building codes (Kirshen et al. 2008). Major foundations are funding studies of new financial mechanisms for resilience.

This process of organizing for adaptation raises several questions: How do organizations make sense of the risks associated with the Anthropocene? Which actors and what frames are engaged in the planning and decision-making processes? How do new processes and structures evolve to “manage risk”? How are these response processes affected by differential power and interests? What conflicts arise regarding risk management mechanisms and priorities, for example, between resilience and economic growth? And who will benefit from climate adaptation resources?

Risk regimes: Organizing for the unprecedented

We develop the concept of a “risk regime,” building on earlier work on risk society (Beck 2009; Beck et al. 1992), value regimes (Levy and Spicer 2013; Levy et al. 2016), urban regimes (Mossberger and Stoker 2001; Whitehead 2013), and organizational management of risk (Linnenluecke et al. 2012; Whiteman et al. 2011). We use this risk regime concept to examine the interaction of physical risks with economic, political, and discursive forces and the ways in which new processes are emerging that shape the construction, management, and allocation of risk. We illustrate the framework with a case analysis of climate adaptation in Boston.

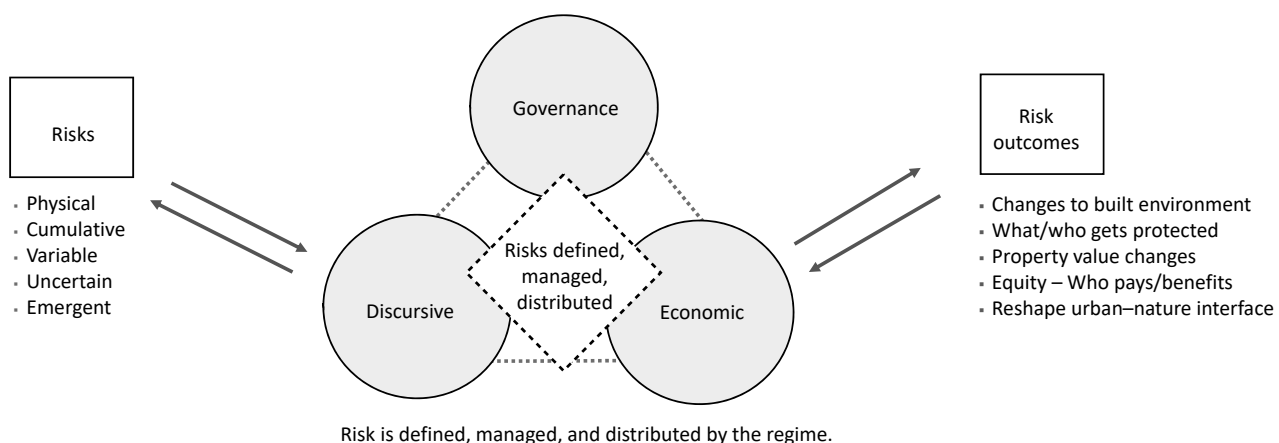
The Anthropocene concept suggests that risks have become “less readily identifiable, more problematic, less easily managed, and more anxiety-provoking” (Gephart Jr et al. 2009, 192), and thus cannot be objectively assessed (Holt 2004). Critical perspectives on risk management questions draw attention to the political economy of risk and the ways that perceptions of environmental risks are shaped by cultural context (Beamish 2001). Risk perceptions are actively

contested and shaped by organizations with economic interests, for example, over nuclear power (Cable et al. 2008) or genetically modified food (Schurman and Munro 2009). Indeed, “risks emerge from the very organizing processes through which they are assessed and managed” (Maguire and Hardy 2013, 232). Organizational pressures of hierarchy and cost control can exacerbate risks and silence concerns about them (Gephart Jr 2004; Perrow [1984] 2011). Nyberg and Wright (2016) describe how agents define and cement particular risk framings and develop market processes that monetize risk, translating physical into financial risk that can be controlled and transferred.

The concept of a risk regime describes the configuration of actors, rules, markets, and norms that is emerging to address urban climate risk. The contestation over risk definition and management is driven by competing imaginaries (Levy and Spicer 2013; Taylor 2004), which provide a shared sense of meaning “to articulate strategies, projects and visions oriented to these imagined economies” (Jessop 2010, 345). These imaginaries provide some coherence regarding the nature, extent, and manageability of risk, the role of regulatory and market institutions, the distribution of burdens and benefits, and the priority accorded to urban development, social equity, or environmental goals. “Such imaginaries anticipate and invite a significant restructuring of economic, social, cultural and political arrangements, and hence are often highly contested” (Munir et al. 2018).

Theories of urban environmental regimes are particularly relevant for climate adaptation. Whitehead (2013) argues that cities represent “the spatial manifestation of the complex of economic and political processes ... that shape and condition the urban experience.” These processes create tensions when “urban carbon control must be synchronized within a seemingly perpetual imperative for urban growth”

Figure 1: Risk regime conceptual framework



(1352). The traditional “growth coalition” of property developers, financial institutions, and city governments (Harding 1994) is likely to dominate climate urban adaptation policy.

Our risk regime framework suggests how a network of actors structures the way that risk is defined and managed. Figure 1 depicts the economic, governance, and discursive configurations that constitute a regime, and the dialectic between the destabilizing potential of physical risks, the structure and processes of the regime, and potential outcomes. The economic dimension of the regime concerns mechanisms of value creation, market structures, and business models at the firm and city levels; the discursive dimension relates to the semiotic systems that structure conceptions of risk and appropriate responses; and the governance dimension includes formal and informal rules, power relations, and organizations with authority (Levy et al. 2015).

Managing climate risks in Boston, Massachusetts

Boston has been considered a leader in planning for both climate mitigation and adaptation. Various reports have signaled a growing awareness of climate risks, a more sophisticated knowledge of specific impacts, and a move toward adaptation and implementation. For example, “A Climate of Progress” (Boston 2011) recognized the need to “give adaptation the same priority as mitigation,” and documented social and economic inequities associated with climate risks. The region also has an active community of nongovernmental organizations (NGOs), university researchers, consulting firms, and investors engaged on climate issues.

Hurricane Sandy in 2012 placed adaptation on the agenda of policymakers and business, even though Boston narrowly avoided major damage because the storm hit at low tide. The *Rising Tide* (2013) report included the first vulnerability assessment of flood risk in Boston and urged flexible adaptation strategies across agencies and sectors. Subsequent assessments, including the CRB reports, provided a more granular picture of risks. Boston is fourth in the US in terms of value-at-risk (Hallegatte et al. 2013) partly because large swathes of the city were built on filled-in harbor areas (Boston 2016). Reports paint a challenging future as the century progresses:

... almost 20 percent of Boston’s land area will be inundated by a 1% flood, exposing almost 90,000 residents and \$90 billion worth of real estate to flooding and 10 percent of Boston will be at risk of chronic stormwater flooding ... If

these climate hazards are not addressed, they will threaten Boston’s livability and economic viability, and they will disproportionately impact socially vulnerable populations ... (Boston 2016, 1)

Boston has experienced substantial development in vulnerable waterfront areas of the city, and significant flooding affected the Seaport district and other coastal areas during two “100 year” storms in early 2018. Enduring inequality has also been a source of tension. Boston has one of the highest levels of inequality for a major US city (Berube and Holmes 2016) and community groups highlight the intersection of climate risks with other vulnerabilities, such as low-quality housing, poor healthcare, and lack of insurance. Business groups have begun to evaluate the impact of climate risks on real estate, tourism, insurance, and operations. A Better City, a local group of 130 companies in multiple sectors including retail and property, has expanded its work from emissions reductions to adaptation and resilience.

Organizing the risk regime: Three imaginaries

Our immersion in Boston’s adaptation process involved attending many meetings and interviewing a range of actors. Analyzing this data helped us identify three imaginaries that represent distinct approaches to understanding and managing risks. The imaginaries are performative in that they represent how actors think the regime *ought* to be structured and inform strategies that actors pursue to realize them. The actual positions taken by various actors, as well as the trajectory of the emerging regime in practice, draw elements from several of these imaginaries.

The *business as usual imaginary* emerged as a cautious approach that stresses uncertainties in forecasts of climate impacts, the high cost of resilience investments, and concern that ambitious initiatives might disrupt existing business models and power relations. While acknowledging that climate risks exist, advocates for this imaginary emphasize the need for flexibility as the future unfolds and the risks of expensive and unnecessary actions. The key actors advocating for aspects of this imaginary are private sector actors, particularly property developers, but also some city officials concerned with the tax base.

The existing governance of the physical development of the city is largely in the hands of private property developers and investors, but constrained and guided by municipal zoning, planning, and permitting. The business community feared that rising concerns over climate risks would lead to stricter reg-

ulatory policies and higher construction and insurance costs. One real estate sector representative stated that: “One-size-fits-all building codes will be expensive; they don’t reflect the specific vulnerabilities and risks of each location and type of building. I am skeptical about requirements. The market is driving energy efficiency, and will drive resilience. Forcing developers to do the right thing assumes they are ignorant.” Another developer argued for an approach based on return on investment (RoI): “We are building to an uncertain sea-level future. We need careful investing but not overinvesting. Risk and cost has to balance out. One has to be careful, we should start with smaller measures.”

The property development sector did not deny climate risks, and was beginning to be concerned about property values declining as awareness of risks grew. It was therefore open to large-scale technological fixes that might enable business to continue as usual in the city and keep insurance costs down – as long as most of the cost was borne by federal and state funds. One adaptation project under consideration was a harbor barrier that could cost \$8–\$15 billion.

The *innovative models and finance imaginary* involved the transformation of physical risks into technical and financial problems amenable to management, perhaps even revealing new business opportunities. This imaginary goes beyond “trusting the market,” as in the business as usual imaginary, relying more on innovation and entrepreneurship to create new markets and business models. Risks are acknowledged in this imaginary, but they are tamed and controlled through models that purport to convey with precision the extent and cost of flooding with particular probabilities at various times decades hence. These risks would then be amenable to cost–benefit analysis and to the development of sophisticated financial instruments, supported by a new raft of resilience metrics and disclosures that attempt to capture the “value” of investments that reduce future losses.

Cities and towns were enchanted by the promise of technical expertise and market solutions that relieved them of the financial and political costs of adaptation. This promise also helped secure finance and insurance companies an influential seat at the policy table. Advanced analytics and innovative financial and insurance mechanisms, such as catastrophe and performance bonds, were proposed as innovative solutions to cities lacking the capital for adaptation investments. One global insurance executive stated: “Insurers can work for cities. Once we’ve got the modeling, you can create the rules of the game for finance – resilience investment and catastrophe bonds. It isn’t all bad news, there is a real business and city level dividend with climate risks.” The focus on models and monetization, however, made it difficult to include social factors such as equity in adaptation planning. A consultant in a risk modeling firm remarked: “You have to put a number on equity and social issues, unfortunately – you have to make sure it’s monetized if you want it to be included in adaptation. If you don’t monetize, then it won’t be included.”

In the *radical change imaginary*, the Anthropocene was considered too unstable for climate risks to be manageable with technical and financial instruments, however innovative. Proponents of this imaginary were typically environmental activists and community groups, who often express awareness of their vulnerabilities and marginalization from decision-making processes. The radical change imaginary also questioned underlying structures of governance, the primacy of economic values, and relationships at the human–nature interface. One community non-profit director stated: “We can use this time to redesign how planning happens in the city and reimagine who gets to make what decisions over the long-term, and really democratize climate and displacement.”

The radical change imaginary also envisages more radical changes to the material urban form and its boundaries with nature. In contrast to the notion of a harbor barrier as a sharp boundary wall protecting the city from the dangers of nature, the “Boston Living with Water” discourse has been promoted, through design competitions in Boston and New York, as a more progressive concept that blurs urban boundaries with nature and can address multiple goals. One local design idea suggested “Boston as Venice,” with a network of canals allowing storm-surge to penetrate the city without causing damage. The vision is to achieve a climate future that is “economically and socially sustainable, inclusive and equitable, and beautiful” (Living with Water 2015). Though primarily located in the design community, this integrative vision resonates strongly with community groups. Community organization members called for a broader conception of resilience that considers equity, people, and place. One leader passionately argued that: “The land underneath you has become more valuable than you. Investment needs to be about people, private and public spaces in the neighborhood.”

The emerging risk regime: The progressive instrumentalists

The emerging risk regime: The progressive instrumentalists

Our study suggested that the trajectory of the emerging regime is being shaped by competition and cross-fertilization among three imaginaries, which constitute visions of future risk regimes, but are rooted

in actors' interests, interpretive frames, and institutional locations. These are multiple competing visions regarding the desired contours of the emerging regime. For example, a risk regime could be driven primarily by public agencies and regulations or by markets and private business. It could envisage large-scale region-wide engineering projects such as a harbor barrier, or a more incremental approach. It could entail a more profound reconsideration of the human and urban interface with nature, or an extension of the traditional view that natural risks can be modeled, tamed, and managed.

We characterize the risk regime we observe actually emerging in the Boston region as *progressive-instrumentalist*, with close parallels to Stone's (1993) "middle-class progressive urban regimes." It reflects a degree of convergence among the core actors and has hegemonic appeal in its apparent promise to reconcile economic growth and resilience through technical analysis, consensus around scientific assessments, multi-stakeholder governance, business and financial innovation, and creative urban design. It also represents a process of compromise and accommodation, as business and government recognize the need for a collaborative, systemic approach that mobilizes and adapts regulations, markets, and private capital.

As a hegemonic accommodation, however, the progressive-instrumentalist regime does not reflect all stakeholder interests and viewpoints equally. Technical and financial actors, interests, and models are privileged and dominate the key decision-making meetings. Although equity concerns are noted occasionally in official reports, the radical change imaginary has largely been marginalized, being vocalized and represented in separate fora and with quite different language and norms. The regime is also riven with internal tensions. For example, while the need for new governance mechanisms to address the systemic character of climate risks is recognized, there is also evident reluctance to change decision-making processes in more structural ways.

In the economic realm, it is unclear how innovative finance and insurance markets will generate the resources needed, given the scale of investments required and elusive returns on resilience investments. The political struggles over who pays and who is protected have yet to play out. Crucially, the models and assessments used to tame, monetize, and manage risk, thereby keeping stakeholders at the table, run the risk of serious "misfires," for example, by omitting more severe scenarios. Reconciling resilience with continuing coastal development may prove illusory; the emerging risk regime could well be inadequate to prevent disastrous climate-related impacts.

Climate adaptation in the Anthropocene

Climate adaptation is the organized effort to grapple with emerging and unprecedented climate impacts. Our study illuminates how a network of professionals, business managers, policymakers, and community members is working to develop the organizational and knowledge infrastructure to manage risks. In studying the actors, processes, and discourses entailed in grappling with adaptation in the Boston region, we bring a grounded and decidedly organizational lens to conceptualize the Anthropocene.

The Anthropocene also opens an opportunity to explore "many futures – imaginaries about worlds that would be good to live in and ways of reaching them" (Lidskog and Waterton 2016, 399). Yet the recognition that the Anthropocene presents unprecedented and unpredictable impact stands in sharp contrast to the emergent technocratic risk regime that purports to reconcile climate change with preserving the economic and political status quo. It might be more accurate to say that the Anthropocene itself is being constructed within this organizational process, in that the contested process of structuring a risk regime molds our understanding of planetary risks as well as the material responses to it. Approaching adaptation from the perspective of the Anthropocene and risk society demonstrates the discontinuity between the historical stability of the climate – and the social and economic institutions that evolved within it – and an unstable, unpredictable future in which our institutionalized mechanisms for managing risk are inadequate. Moreover, society is locked into climate disruptions for generations to come (League et al. 2019). While the Intergovernmental Panel on Climate Change repeatedly calls attention to the narrow window of opportunity for reducing emissions, they are still rising (World Meteorological Organization 2020).

The events of 2020 – a pandemic, unprecedented climate-related disruptions, social movements demanding racial justice, and political upheaval – have brought wider attention to human vulnerabilities and to the inequalities associated with environmental and public health crises. As society contends with these challenges, there are emerging opportunities to address the structural social and economic rifts that shape the nature and distribution of risks, as well as the differential benefits and costs of public action. Fundamentally, the way in which we understand and manage risks to remain within planetary boundaries will reconfigure our relationship with the natural environment.

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