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Hazards, Climates and Cultures: Reflections on recent scholarship and proposals for further research

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Abstract

Writing in 2006 in the aftermath of Hurricane Katrina, James K. Mitchell challenged social science researchers of hazards and disasters to broaden their research agenda. He advocated a move beyond simply applying existing social science insights to contemporary events to reflection on the larger project of the production of knowledge through academic research, the application of that knowledge to public policy, and the role of the social sciences in these endeavours. In particular he urged consideration of the context dependent nature of scientific knowledge on hazards, the relationships between scientific and non-scientific ways of understanding and responding to disasters, and the complex and often contradictory ways in which hazards can be framed, interpreted and understood. Ten years on from this challenge, this paper reviews scholarship that has addressed some of these concerns and proposes questions for further research. It argues that while social science research has advanced in some of the directions proposed by Mitchell, the challenge of complex, dynamic and contradictory interpretations of hazards and the implications of the provisional nature of knowledge remain understudied. It also suggests that while recent innovations in the co-production of hazards knowledge are welcome, there may be significant challenges to utilising these approaches on a wider basis.

1. Introduction

When Hurricane Katrina struck the US Gulf Coast in August 2005 its impacts made painfully obvious to a wider audience, a suite of issues that were all too familiar to social science researchers who had studied the relationships between human society and the processes or events we describe as natural hazards and disasters. In an attempt to shift the discussion away from some of the simplistic and inaccurate narratives that dominated media coverage and political discourse in the aftermath of Katrina, the US Social Science Research Council conveyed a forum entitled *Understanding Katrina: Perspectives from the Social Sciences*, to explore how social science research could help to understand the causes of the disaster and its impacts, how the affected communities might recover, and how similar tragedies might be prevented in the future. This online forum includes over thirty contributions written by forty scholars and practitioners representing a wide spectrum of academic disciplines including geography, sociology, history, anthropology and political science. Many of the contributions illuminated important aspects of the disaster through the application of existing social science

knowledge. For example Susan Cutter applied well established geographic perspectives on socio-economic vulnerability to explain who suffered most during the disaster and why (Cutter, 2006). Neil Smith drew on critical perspectives to challenge narratives of Katrina as a 'natural' disaster and emphasised the socio-economic decision-making that produces vulnerability (Smith, 2006). Charles Perrow applied the insights of organisational sociology to analyse the role of the Federal Emergency Management Agency in the disaster (Perrow, 2006).

Each contribution to the forum offered important insights into the causes and consequences of the disaster. These remain relevant today as they provided important suggestions for how the social sciences might contribute to the goal of preventing similar events in future. However these papers generally did not reflect on the larger project of the production of knowledge through academic research, the application of that knowledge to public policy, and the role of the social sciences in these endeavours. Ken Mitchell's contribution took up these broader questions, exploring the role of social science research in society and challenging social scientists to embrace a broader and more radical research agenda. He argued that the response of the social sciences to the disaster would be as insightful in what it told us about the social sciences as in what it told us about the disaster itself. He asked whether the social sciences might engage with "largely uncharted intellectual territory, to consider how different systems of knowledge about our ambiguous physical environment, and competing systems of action within our fractious society, can be brought together in pursuit of survival, security, sustainability and the other diverse goals that humans wish to obtain" (Mitchell 2006).

Ten years on from Mitchell's challenge, this paper revisits some of the questions he raised and reflects on the extent to which they have been addressed in social science scholarship over the past decade. It begins by outlining Mitchell's observations and proposed research agenda in more detail, before reviewing literature that through its applied, theoretical or methodological contributions has in some way advanced hazards research in the directions he suggested. The paper concludes by arguing that while substantial progress has been made, significant uncharted intellectual territory remains.

2. Mitchell's Challenge and Its Implications

In his 2006 reflections on Hurricane Katrina, Ken Mitchell argued that social science research on environmental hazards must focus on the recognition that scientific knowledge is both context dependent and provisional, while also analysing the often complex relationships between scientific knowledge on the environment and other systems of knowledge and interpretation. This means recognising that the same process, event or location that could represent a hazard can also be interpreted in a wide variety of other ways. For example "the storm that could devastate might also connote an opportunity for profit, a welcome test of personal resilience, a heightened aesthetic experience, a catharsis and a wide range of other meanings that are rooted in our society's diverse interests and values." (Mitchell, 2006). A clear consequence of this approach is the recognition that these diverse interpretations may often be incompatible with each other and may change over time in response to changing contexts or to the shifting priorities or values of the actors concerned. Mitchell suggests that

we must “recognize that interpretations of hazard are multiple, unstable, contested and often mutually incommensurable” (2006). He proposes that in doing so hazards researchers can engage a wider constituency of actors in contributing both to advancing knowledge on risk and hazards in society but also to informing more effective decision-making and policy to prevent future disasters.

These questions are not just academic or theoretical considerations but have important implications for decision-making and policy. A practical example of this emerged in the Clontarf area of Dublin City during 2011 when a proposed flood defences scheme featuring large sea walls was vigorously opposed by hundreds of local residents. While the flood hazard presented by coastal surges in this part of the city was recognised by both the City Council engineers and the local population, Dublin Bay also had other meanings and significance for the local residents. Chief among these was the aesthetic value of the coastal landscape. The residents recognised the coastline as a source of risk through high tides and storm surges but views across the bay were also considered a vital visual amenity that would be lost as a result of the large sea walls proposed. Consequently the residents resisted the proposed defences which would undoubtedly have protected homes, businesses and local infrastructure from current and future floods. Instead they campaigned for smaller defences that offered a lower level of flood prevention but would not obstruct views across the bay. This dispute arose due to the fact that local residents employed framings and experiences of the local coastal environment that were more complex than those anticipated by the City Council engineers who were focused primarily on reducing exposure to flooding. While their interpretations of the coastal landscape, its risks, resource and amenities were clearly in tension with each other, the local residents sought a flood management strategy that balanced their somewhat incommensurable interpretations of a hazardous environment.

While Mitchell’s focus was environmental hazards, these questions have obvious wider application, both to all forms of contemporary environmental change, but also to processes of socio-economic and cultural change. Climate change, disasters, globalisation, sustainability and numerous other contemporary social, economic, cultural and environmental issues are all interpreted in diverse, dynamic and often contradictory ways by the variety of actors who experience them. In the next section I review work that addresses some of Mitchell’s proposals, through exploring divergent interpretations of hazards, by analysing the social and cultural contexts within which hazards knowledge is produced and by widening the constituency of participants in decision-making.

3. Recent Developments in Hazards Research

Mitchell’s challenges raises questions for the theoretical, methodological and applied contributions of the social sciences and related disciplines to the study of hazards, disasters and environmental change. This section of the paper reviews selected examples of research that I suggest collectively represent important steps towards addressing two aspects of his challenge. They shed new light on the diversity of ways in which human beings make sense of and understand hazards and disasters and their interactions with them, and they broaden the constituency of contributors to knowledge production and decision-making, both within the context of academic research and in applied decision-making. These literatures come

largely from within traditional social science disciplines such as geography and sociology but valuable contributions are also emerging from other sources such as the developing field of environmental humanities.

Recent years have seen an increased focus on attempting to untangle and understand the diverse ways in which individuals, groups and organisations make sense of and interpret hazards, disasters and environmental changes. Scholars have explored the relationships between disaster risk reduction and cultures and the ways in which values, beliefs and proprieties shape how hazards are experienced and managed (Bankoff, *et. al.*, 2015). While recognising that the concept of culture is itself complex and dynamic, researchers have increasingly recognised the need to engage with culture gaps such as those that allow outsiders in particular contexts (often well intentioned NGOs or other organisations engaged in disaster risk reduction activities) to conceptualise risks and vulnerabilities in ways that are sometimes radically at odds with how the same processes or events are interpreted by the communities they intend to help (Bankoff, *et. al.*, 2015). There is also now an increased awareness that local communities often do not speak with one voice and different groups within them interpret risk and vulnerability in a variety of ways (Bankoff, *et. al.*, 2015). Studies of culture and disaster risk reduction have examined a diverse range of issues and themes including among many others; the reasons why populations return to the same exposed locations in the aftermath of disasters (Cannon, 2008), the influence of paradigms of securitisation in shaping contemporary approaches to hazards and disasters (Hewitt, 2015), the role of built environments in cultural adaptation to disasters (Bankoff, 2015), the influence of religion and beliefs in shaping interpretations of and responses to disaster (Schipper, 2015) and the interactions between contemporary celebrity culture and disasters (Alexander, 2015). While the study of human dimensions of hazards and disasters has often been dominated by social science research methods commonly used in fields such as geography, sociology and anthropology, humanities approaches have also shed new light on the ways in which human interactions with hazards and disasters are shaped through the stories that are told about them through mediums such as literature and art. Alexander (2016) explores the portrayal of disasters in western art, outlining how different types of hazards have been presented in a wide diversity of ways in a range of historical contexts. Rigby (2015, 2008) utilises the tools of literary studies to weave together historical and literary narratives to evaluate how a range of hazards including earthquakes, storms, floods and fires have been framed in a variety of historical contexts. In doing so she argues that the stories we tell about contemporary risk, hazards and environmental changes will play an essential role in determining the course of societal interactions with contemporary environmental challenges.

While burgeoning literature on culture and disasters has emerged within the broad field of natural hazards research a similar emphasis has emerged within studies of climate change. Driven in large part by the influential work of Mike Hulme (2015; 2012; 2009) there is now a substantial volume of literature exploring the diverse ways in which the ideas of climate and climate change are conceptualised, framed and understood and the ways in which climate knowledges are produced. Scholars have examined the ways in which values and beliefs shape perceptions and conceptualisations of climate (Bellamy and Hulme, 2011; Hulme 2009), experiences of climate in diverse historical contexts (Adamson, 2012), examples of historic debates over the causes of local or regional climate change (Moon, 2010), the roles of

scientific and medical knowledge and the tourism industry in changing perceptions of climate over time (Carey, 2011), and the roles of the complex interactions between cultural norms, emotions and lived experiences in shaping responses to contemporary climate change (Norgaard, 2011). In addition to this work within what can now be described as the field of climate and cultures, there is also a growing literature that utilises the concept of frames to examine the ways in which individuals and organisations make sense of climate change in a variety of contexts (Fleming *et. al.*, 2015; Fuenfgeld and McEvoy, 2014; Gasper, *et. al.* 2013; Morton, *et. al.*, 2011). Researchers exploring vulnerability and adaptation also increasingly recognise the importance of framings of risk and vulnerability in shaping both academic research and applied decision making (Collette, 2016).

Alongside the growing emphasis on recognising the multitude of complex ways in which hazards, disasters and environmental changes can be understood, interpreted and framed, there has also been an increasing caution against positions that privilege one type of knowledge over another, particularly in the relationships between what are described as local knowledges and expert knowledges (Haughton, *et. al.*, 2015). A consequence of this sensitivity has been an interest in developing methods for co-production of knowledge involving a range of stakeholders including experts such as planners and engineers, academic researchers from both the physical and social scientists, local residents, businesses and other interested parties (Landstrom, *et. al.* 2011; Lane, *et. al.* 2010; Mitchell, *et. al.*, 2016; Whatmore and Landstrom, 2011). Such co-production approaches are often challenging and time consuming, requiring an openness to new possibilities from all parties involved. However they have demonstrated that real changes in outcomes from those that were likely without co-production can occur, and their impacts can continue long after the formal processes of knowledge co-production have concluded (Whatmore and Landstrom, 2011). Co-production approaches can fundamentally change the positions of scientists and scientific knowledge (Lane, *et. al.* 2010; Landstrom, *et. al.*, 2011), can reveal the breadth and depth of knowledge possessed both by those traditionally classified as experts and those classified as lay populations (Lane, *et. al.*, 2010) and can produce new constituencies or publics, thus reshaping the local politics of hazards management decision-making (Lane, *et. al.*, 2010; Whatmore and Landstrom, 2011).

4. Reflections on the literature and proposals for future research

This review of the literature does not claim to be a comprehensive overview of scholarship on hazards, disasters and environmental change over the last decade as such an undertaking would be well beyond the scope of this paper. Instead these selected examples serve to highlight instances of research and scholarship that push the boundaries of the environmental social sciences into some of the uncharted intellectual territory that Ken Mitchell challenged us to embrace in his reflections in the aftermath of Hurricane Katrina (Mitchell, 2006). As outlined in the preceding section there is now a clearly a substantial and growing body of literature focused on both hazards and climate that is highlighting the diversity of ways in which environmental processes and events are framed, conceptualised and understood by a diverse range of human actors in a very wide variety of cultural contexts. Although emerging from distinct groups of researchers deploying a range of approaches, this

work is helping to illuminate how diverse constituencies can interpret the same events in radically different ways and demonstrates the implications of these divergent interpretations for decision-making and policy. This work has also produced a much greater awareness of and sensitivity to the contexts within which hazards knowledge is produced and used. There is also now a small but growing group of researchers who have employed innovative co-production approaches to generating knowledge on risk and hazards. Their experiments in co-production have brought together experts and lay populations to create new constituencies of knowledge producers and decision-makers. All of these are welcome developments and they have advanced both the theoretical and applied contributions of the social sciences to enabling us to understand and live more effectively with environmental shocks, stresses and changes.

However there is much work still to be done to address some aspects of Mitchell's challenge. To conclude this paper I offer some brief reflections on the limitations of the progress made in the past decade and further questions for the social science of hazards and disasters to consider in the years ahead. While there is now a substantial body of literature that explores diverse framings, interpretations, understandings and conceptualisations of hazards, disasters and climate, much of this work explores divergence between different groups of stakeholders such as external experts versus local populations. While this recognition is very welcome there has been limited engaged with the complex, contradictory and messy ways in which the same groups or individuals may interpret the same hazard in diverse ways. The same event, process, or local environment may constitute a threat to life or property and a source of inspiration or aesthetic pleasure for the same individual or groups. These multiple and often contradictory interpretations of the same experience may be held in tension and the balance between them may shift over time in response to new knowledge or experience or changing social, cultural, economic or political contexts. To return to the Dublin example mentioned earlier, the views of local residents on the balance between their desire to preserve a treasured amenity and the need to protect homes and businesses from flooding may shift if a combination of sea level rise and more intense storm events leads to further flooding. The sea may change from being viewed as both an amenity and a hazard to being primarily considered as a hazard. Alternatively other factors such as increased awareness of the health benefits of exercise or a desire to connect with the 'natural' environment might heighten the recreational value attached to unrestricted access to the shoreline.

A focus on the diverse ways in which hazards are understood also raises profound questions about how hazards knowledge is used in decision-making. If as Mitchell suggests in his 2006 piece, all hazards knowledge must be considered context dependent and provisional, we must then consider whether the lessons learned in on case study can have wider application and can be applied elsewhere? If all hazards management decisions must be considered provisional then we must develop methods for ongoing reflection, review and revision when necessary, in response to new information or experiences.

Experiments in co-production of knowledge such as that which brought together local stakeholders, natural scientists and social scientists to explore flood hazards in the English village of Pickering (Landstrom, *et. al.* 2011; Lane, *et. al.* 2010; Whatmore and Landstrom, 2011) also raise important questions for academic hazards research and its practical applications. Co-production typically involves a significant commitment of time and

resources from all of the participants involved. This presents challenges for academic researchers whose resources depend on external research grants, for local officials and decision-makers whose resources are often heavily constrained and subject to a range of competing demands, and for local residents and other stakeholders with a range of other goals, aspirations, and demands on their time. As experiments in both the production of knowledge and the application of that knowledge in decision-making, co-production methodologies blur the distinctions between the categories of academic research and applied decision-making which have often been viewed as separate. While research funders may be quite willing to support such initiatives when they are novel and innovative it is not clear how they might be funded if they are to be rolled out on a wider basis. The successful use of co-production to date has also been in locations where recent events or experiences have created the conditions to bring a coalition of interested parties together, for example the 2007 flood in Pickering (Lane, *et. al.* 2010; Whatmore and Landstrom, 2011) or Hurricane Sandy in New Jersey in 2012 (Mitchell, *et. al.*, 2016). Given the time and resource commitments involved, implementing co-production techniques in locations where recent experiences have not created similar conditions or where hazards are seen as pressing concerns by one group (such as academic researchers) but not by other stakeholders may also prove more difficult. These issues present a challenges for hazards researchers to explore whether co-production techniques can be evolved in ways that preserve or enhance all of their benefits, while at the same time reducing the resources and commitments required in order to implement them more widely.

In summary, it is clear that while much progress has been made in exploring the uncharted intellectual waters that Ken Mitchell highlighted in 2006, there is still considerable scope for further fruitful intellectual expeditions. Further consideration of the questions and issues raised here will continue to push the social science of hazards and disasters in new directions and to enhance their contribution to helping us to live with hazards in ways that also allow us to achieve the many diverse goals that human beings strive to achieve.

References

- Adamson, G. (2012). 'The languor of the hot weather': everyday perspectives on weather and climate in colonial Bombay, 1819-1828. *Journal of Historical Geography* 38(2): 143-154.
- Alexander, D. (2016). The portrayal of disaster in western fine art. *Environmental Hazards*.
- Alexander, D. (2015). Celebrity culture, entertainment values... and disaster. In *Cultures and Disasters: Understanding cultural framings in disasters risk reduction*, F. Kruger, G. Bankoff, T. Cannon, B. Orłowski and E.L.F. Schipper (eds.), pp. 179-192. Abingdon, Routledge.
- Bankoff, G. (2015). Design by disasters: seismic architecture and cultural adaptation to earthquakes. In *Cultures and Disasters: Understanding cultural framings in disasters risk reduction*, F. Kruger, G. Bankoff, T. Cannon, B. Orłowski and E.L.F. Schipper (eds.), pp. 53-71. Abingdon, Routledge.

Bankoff, G., T. Cannon, F. Kruger and E.L.F. Schipper (2015). Introduction: exploring the links between cultures and disasters. In *Cultures and Disasters: Understanding cultural framings in disasters risk reduction*, F. Kruger, G. Bankoff, T. Cannon, B. Orłowski and E.L.F. Schipper (eds.), pp. 1-16. Abingdon, Routledge.

Bellamy, R. and M. Hulme (2011). Beyond the Tipping Point: Understanding perceptions of abrupt climate change and their implications. *Weather, Climate and Society*. 3(1): 48-60.

Carey, M. (2011). Inventing Caribbean climates: how science, medicine, and tourism changed tropical weather from deadly to healthy. *Osiris*. 26:129-41.

Canon, T. (2008). Vulnerability, 'innocent' disasters and the imperative of cultural understanding. *Disaster Prevention and Management*, 17(3) 350-357.

Colette, A.L. (2016) The politics of framing risk: Minding the vulnerability gap in climate change research. *World Development Perspectives*. 1: 43-48.

Cutter, S. (2006). The Geography of Social Vulnerability: Race, Class, and Catastrophe. *Understanding Katrina: Perspectives from the social sciences*.
<http://understandingkatrina.ssrc.org/Cutter/> [10 July 2016].

Fleming A., L. Rickards and A.M. Dowd, (2015) Understanding convergence and divergence in the framing of climate change responses: An analysis of two wine companies. *Environmental Science and Policy* 51: 202-214

Füenfgeld H. and D. McEvoy (2014). Frame Divergence in Climate Change Adaptation Policy: Insights from Australian Local Government Planning. *Environment and Planning C: Government and Policy* 32: 603-622

Gasper D., A.V. Portocarrero and A.L. St. Clair (2013) The framing of climate change and development: A comparative analysis of the Human Development Report 2007/8 and the World Development Report 2010. *Global Environmental Change*. 23: 28-39

Haughton, G., G. Bankoff and T.J. Coulthard. (2015) In search of 'lost' knowledge and outsourced expertise in flood risk management. *Transactions of the Institute of British Geographers*. 40(3): 375-386.

Hewitt, K. (2015). Framing disaster in the 'global village': cultures of rationality in risk, security and news. In *Cultures and Disasters: Understanding cultural framings in disasters risk reduction*, F. Kruger, G. Bankoff, T. Cannon, B. Orłowski and E.L.F. Schipper (eds.), pp. 19-36. Abingdon, Routledge.

Hulme, M. (2015). Climate and Its Changes: A cultural appraisal. *Geo: Geography and Environment* 2(1): 1-11.

Hulme, M. (2012). Telling a different tale': literary, historical and meteorological readings of a Norfolk heatwave. *Climatic Change* 113(1): 5-21.

Hulme, M. (2009) *Why We Disagree About Climate Change: Understanding controversy, inaction and opportunity*. Cambridge, Cambridge University Press.

- Landstrom, C., S.J. Whatmore, S.N. Lane, N.A. Odoni, N. Ward and S. Bradley (2011). Coproducing flood risk knowledge: redistributing expertise in critical 'participatory modelling'. *Environment and Planning A*. 43: 1617-1633.
- Lane, S.N., N Odoni, C. Landstrom, S.J. Whatmore, N. Ward and S. Bradley (2010). Doing flood risk science differently: an experiment in radical scientific method. *Transactions of the Institute of British Geographers*. 36: 15-36.
- Mitchell, J.K. (2006). Empowering knowledge: A modest proposal for a broader social science research agenda in the wake of Katrina. *Understanding Katrina: Perspectives from the social sciences*. <http://understandingkatrina.ssrc.org/Mitchell/> [10 July 2016].
- Mitchell, J.K., K. O'Neill, M. McDermott and M. Leckner, (2016). Towards a transformative role of local knowledge in post-disaster recovery: Prospects for co-production in the wake of Hurricane Sandy. *Journal of Extreme Events*. 3(1):
- Moon, D. (2010). The Debate over Climate Change in the Steppe Region in Nineteenth-Century Russia. *The Russian Review*. 69(2): 251-275.
- Morton T.A., A. Rabinovich, D. Marshall and P. Bretschneider (2011). The future that may (or may not) come: How framing changes responses to uncertainty in climate change communications. *Global Environmental Change*. 21: 103-109
- Norgaard, K. (2011) *Living in Denial: Climate change, emotions and everyday life*. Cambridge, MIT Press.
- Perrow, C. (2006). Using Organizations: the Case of FEMA. *Understanding Katrina: Perspectives from the social sciences*. <http://understandingkatrina.ssrc.org/Perrow/> [10 July 2016].
- Rigby, K. (2015) *Dancing with Disaster: Environmental histories, narratives and ethics for perilous times*. Charlottesville, University of Virginia Press.
- Rigby, K. (2008) Discoursing on disaster: the hermeneutics of environmental catastrophe. *Tamkang Review*, 39 (1): 19-40.
- Schipper, E.L.F. (2015). Religion and belief systems: drivers of vulnerability and entry points for resilience building? In *Cultures and Disasters: Understanding cultural framings in disasters risk reduction*, F. Kruger, G. Bankoff, T. Cannon, B. Orłowski and E.L.F. Schipper (eds.), pp. 145-154. Abingdon, Routledge.
- Smith, N. (2006). There's No Such Thing as a Natural Disaster. *Understanding Katrina: Perspectives from the social sciences*. <http://understandingkatrina.ssrc.org/Smith/> [10 July 2016].
- Whatmore, S.J. and Landstrom, C. (2011) Flood apprentices: an exercise in making things public. *Economy and Society*. 40(4): 582-610.