

FLUID BOUNDARIES: THE SOCIAL CONSTRUCTION AND MEMORY  
OF FUTURE CATASTROPHIC ENVIRONMENTAL RISK  
IN A COMMUNITY ON THE OREGON COAST

by

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## THESIS ABSTRACT

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Title: Fluid Boundaries: The Social Construction and Memory of Future Catastrophic Environmental Risk in a Community on the Oregon Coast

The Oregon coast is facing the dual perils of climate change and the catastrophic Cascadia subduction zone earthquake and tsunami, yet many communities remain unprepared. Using qualitative interviews with residents of Coos Bay, Oregon, this study traces how communities facing these perils socially construct their visions of change by “remembering the future” and how this future memory influences unsettlement that, in turn, can trigger revision of strategies of action to deal with environmental risk.

Participants understood these risks through three interrelated themes: analogy to familiar circumstances such as regular winter flooding, narratives of isolation and self-reliance based in collective history, and visions of symbolic preparedness. Each of these themes drew the conversation away from the material reality of environmental catastrophe, reducing relative unsettlement. Since the way that communities collectively understand environmental risk may influence preparatory action, these observations can help to explain the disjunction between knowledge of risks and response.

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# CHAPTER I

## INTRODUCTION

In recent years, sociologists have used a number of theories developed outside of the realm of environmental studies to improve our understanding of people's idiosyncratic responses to environmental risk (e.g. Norgaard, 2011, Brulle et al., forthcoming). Environmental risk, and especially risk posed by climate change and other natural disasters, presents special challenges to individuals and communities due to the uncertainty inherent in how these risks will manifest over time. For example, while scientists are in substantial agreement that the effects of climate change will be felt on the Oregon coast, significant uncertainty exists as to the exact nature of these effects and when they will manifest. This includes wildly variant predictions of the expected frequency and magnitude of future coastal flood events, as well as about how such flood events might impact physical landforms and human communities (Baron et al., 2015, Cheng et al., 2015, Wong et al., 2014, Moser et al., 2014, Mote et al., 2014, Serafin & Ruggiero, 2014, National Research Council, 2012).

On the Oregon coast there exists another form of risk posed by coastal change: that of the Cascadia subduction zone (CSZ) earthquake and tsunami that, in addition to reaching a magnitude of eight or higher on the Richter Scale, may bring tsunami waves of eight meters or more (Wood et al., 2010, Rogers et al., 1996, Satake et al., 1996). While these results have a historical antecedent—the tsunami that was traced by Satake et al. (1996) to about 9 p.m. on the evening of January 26, 1700 using Japanese imperial tsunami records, geological insight, and indigenous knowledge passed down within the Pacific Northwest—uncertainty in this context is primarily temporal. Although a future

CSZ earthquake and tsunami is close to a geological certainty, significant uncertainty exists as to exactly when it will occur. Recently published media accounts have suggested that there is a 37% chance of another earthquake striking the Oregon coast within the next 50 years (Casey, 2015). Residents of the Oregon coast live their lives in the shadow of potential catastrophe.

Responses to climate change and other catastrophic risks are not susceptible to purely rational analysis both because people imperfectly predict catastrophic risk (Cerulo, 2006) and because what information they have at their disposal may be uncertain to begin with or not in a form conducive to use by a lay audience (Prudhomme et al., 2010). While the nature of catastrophic environmental change may magnify the role of contextual uncertainty in environmental risk, in practice risk and uncertainty are inextricable. This is expressed in the definition of risk used by Jaeger et al. (2010): “A situation or event in which something of human value...has been put at stake and where the outcome is uncertain.” Clearly, risks arising from both climate change and seismic events fit within this definition, which emphasizes the human factors that complement their geophysical or climatological base.

Climate change is a “wicked problem”—a term used for problems that “have no easy solutions in that they are beyond the capacity of any one organization to solve” (Maibach et al., 2011, p. 1, Rayner, 2012). Accordingly, on a local scale it may be more productive to view responses to potential climate risk as the product of a multitude of decisions and reactions made on an institutional level, on an individual level, and within the interactions between these levels. Earthquake and tsunami preparedness may be centrally managed (Stallings, 1995) but the far-reaching consequences of the CSZ event

also involve a multiplicity of vulnerability concerns that should be addressed by understanding not only the applicable geology but also a wide variety of social structures, from the institutional to the local and individual (Wood et al., 2015, Wood et al., 2010, Tierney, 2007, Stallings, 1995). Leiserowitz (2006, p. 45) underscores the importance of individual risk perception in motivating appropriate social response in the climate change context: “Risk perception can fundamentally compel or constrain political, economic, or social action to address particular risks.”

Moreover, the symbolic definitions that people associate with landscapes may influence both their understanding of environmental risks—from the fundamental understanding that a risk exists to, to its potential extent, to our formulation about how it might manifest—and the planning and management choices that are made in response to the risky event (Greider and Garkovich, 1994, Tierney et al., 2001, Tierney, 2007). In the context of natural disaster research, past forays into the social aspects of the effects of natural hazards have helped to identify additional needs that prompted the development of new aid programs (Tierney, 2007).

Keeping this in mind and recognizing the unique interactions of risk and uncertainty in the context of environmental change, environmental sociologists have studied the role of culture in risk perception, most often interrogating how it influences the manner in which people interpret risk (Wildavsky & Dake, 1990, Dake, 1992, Norgaard, 2011, 2009, Tierney, 2007). This project seeks to build upon their efforts by further exploring how the study of environmental risk might better embrace the complexities of socio-cultural systems. This would serve to partially displace the historical reliance on rationalist cost-benefit analysis and a unitary events-based emphasis

on the material reality of environmental catastrophes (Tierney, 2007). In so doing this research aims to enhance our understanding of the varied and often enigmatic beliefs and behaviors that individuals and communities exhibit in response to knowledge of catastrophic risk.

While to an extent people have individualized perspectives on the world, these perspectives are in part socially constructed: meaning and understanding are developed within the context of the variety of communities with which an individual is associated. These thought communities and their associated identities provide the discursive components that people use to envision the world around them and their relationships with it, providing the tools by which communities collectively make sense of situations and contexts (Zerubavel, 2006, 1999, 1997, Gergen, 1999, Norgaard, 2006, 1999).

This paper surveys and synthesizes a number of theoretical perspectives from sociological approaches to culture, risk perception, place, cognition, and disaster in order to understand how residents of the Oregon coast socially construct and thus envision their environmental future given the persistent specter of uncertain catastrophic risk. Using this theoretical basis a framework is then developed to conceptualize a mechanism by which these risks are either addressed or ignored, providing insight into how aspects of cultural and cognitive sociology may be merged to explain a basis for social action or inertia.

First, Section II consists of a brief survey of two dominant sociological approaches to risk that have embraced aspects of culture with greater or lesser success, as well as a summary of the development of risk within the sociology of natural hazards. Second, using Ann Swidler's (2008, 1986) observations of the contextual deployment of cultural tools in "settled" and "unsettled" times, and focusing on the imperfectly defined

distinction between the two terms, Section III.a asks how the environmental risk might create unsettlement within a community. In turn, this unsettlement influences the deployment of cultural tools that are used to analyze, perceive, and respond to risks, driving ideological and social change. Applying a continuum of social unsettlement developed by Lizardo and Strand (2010), it suggests that recognition of future environmental risk may motivate unsettlement and thus the responsive thought processes that predict and predicate social response.

Third, in Sections III.b - d a framework is built using developments in social constructionism and cognitive sociology to assess the way that communities and individuals living in areas that are under threat of severe adverse environmental change may socially develop and negotiate their perception of those risks. This analysis projects Eviatar Zerubavel's (2006, 1997) work on socially developed memory of past events onto our understanding of future contexts in order to propose that the means by which people "remember" future environmental catastrophe may be socially created and mediated in a manner similar to shared memories. It also emphasizes the importance of place identities in how people remember their environmental future, drawing on the meanings associated with place that have been developed by historic and present conditions.

Finally, using in-depth, qualitative interviews and data analysis conducted with residents of a community on the Oregon coast that is facing risks arising from both climate change and the potentially catastrophic CSZ earthquake and tsunami, Sections IV and V identify a series of discursive practices that are based in historically and contemporarily defined identities that members of this community use to socially construct their understanding of future environmental risk. In sum, the goal is to examine

whether the way people think and speak about environmental change as a community might influence unsettlement of their worldview, in light of the context of what it means to be part of that community.

The community of Coos Bay, Oregon was selected as a study site due to its varied socio-history. This history, with a mix of industrial, resource extractive, leisure-based, and other associations with the coast (Robbins, 2006, Huppert et al., 2003), provides a richness of context that is ideal for the development of ideas about secondary and potentially less known aspects of environmental change and risk. Furthermore, as explored in greater detail below, because of this history the residents hold a diversity of opinions and perspectives on coastal change that have been developed through personalized contexts, community experience, and socially constructed narratives.

## CHAPTER II

### SOCIOLOGICAL AND CULTURAL APPROACHES TO RISK PERCEPTION

Over the past three decades, the two dominant perspectives within the sociology of risk perception have been the risk society approach associated with sociologist Ulrich Beck and cultural theory approach associated with anthropologist Mary Douglas (Tierney, 1999, Wilkinson, 2001, Taylor-Gooby & Zinn, 2006). In order to illustrate a few prevailing themes within the development of social approaches to risk perception, these perspectives as well as a few critiques of each are outlined. Much of the value of these theories lies in the fact that they embrace culture as a wellspring of public risk perception; culture in this context acted as a counterpoint to the rote rationalist calculus of probability and severity often used by experts to describe risk (Tierney, 2007, Leiserowitz, 2006). Preferable to an actuarial approach, each of these methods has



provided “an indispensable means by which we may achieve a *partial* understanding of the cultural reality of risk perception” (Wilkinson, 2001, p. 2, emphasis added). Yet neither of these approaches nor the conceptual rationales that preceded them are sufficient, independently or collectively, for a full appreciation of how risk is mediated and understood. “Risk perception,” it seems, remains “a phenomena in search of an explanation” (Sjöberg, 2000, p. 1).

a. Cultural Theory.

Cultural theory is based in the argument that cultural biases predispose people to view identified risks in different ways. Rooted in the idea that “collective representations of risk perform an important...function in the maintenance of social solidarity” (Wilkinson 2001, p. 4), it takes the view that risk is socially constructed based on three functional “linked domains that constitute a way of life: *cultural biases, social relations, and behavioral strategies*” (Dake 1992, p. 28). “Cultural theorists,” observe Wildavsky and Dake (1990, p. 43), “have proposed that individuals choose what to fear...in order to support their way of life....[S]elective attention to risk, and preferences for different types of risk-taking, correspond to...worldviews or ideologies entailing deeply held values and beliefs defending...patterns of social relations.”

To this end, cultural theory tends to group individuals into categories based upon cultural bias (a rough expression of ideology) towards hierarchical, individualist, egalitarian, fatalist, and autonomous modes of social organization (Dake, 1992). This stands in opposition to the previously institutionalized conception of measurable risk that tended to produce an actuarial “hermeneutic sanitization” of risk theory, “deleting any

other public meanings which are not subsumable to [its] realist-risk framework” (Wynne 2002, p. 470).

Although they were originally conceived in the context of risk associated with novel technologies, Dake (1992) connected these ideologically based cultural biases to more environmentally focused “myths of nature.” Each ideology was linked to a corresponding perspective on how non-human nature and humankind interact. For example, adherents of hierarchical group structuring had an equivalent myth that nature is “robust, but only up to a point” (Dake, 1992, p. 29). Therefore, and in line with the hierarchicalist preference for expert opinion generally, they tend to prefer sustainable development directed by experts. More egalitarian individuals, on the other hand, “espouse the myth that nature is ‘fragile’” and take a more precautionary approach to environmental risks (Dake, 1992, p. 29). Supplementing cultural theory’s formation in the context of collective relationships and identities, it is therefore also possible to bridge the gap between human and environmental identities.

Arguing for the pre-eminence of cultural theory in risk perception, Wildavsky and Dake (1990) outlined the influential perspectives on risk perception that preceded it: these focused on knowledge about risks, as well as individual personality, political allegiance, and economic status. They argued that despite the intuitive appeal of a relationship between each of these concepts and risk, cultural theory better empirically predicted risk preferences. For example, the correlation between greater knowledge and risk preferences was statistically insignificant, and the significant differences predicted by political allegiance were explained by its dependence on the same variables that formed the ideological basis of cultural theory (Wildavsky & Dake, 1990). Notable about

this is not only their conclusions, but also the resilience of simplistic explanations of climate response rooted solely in knowledge, personality, and political allegiance notwithstanding the development of more modern and empirically defensible explanatory models (Wildavsky & Dake, 1990, Norgaard, 2011, 2009).

While cultural theory is preferable to the reductionist theories that preceded it, it also has been critiqued on an empirical basis. In a small sample of Dutch automobile owners Steg and Stievers (2000) found that while the cultural biases that are represented by myths of nature correlate with preferences for risk management strategies, this did not translate into changes in behavior. Their results were “consistent with the proposition that...value orientations, general beliefs, and worldviews do influence specific beliefs, attitudes and norms, but they are not directly related to behavior” (Steg & Sievers, 2000, p. 264). In other words, cultural biases may influence preferences but this should not be taken as proof that they influence behavior: something else appears to be at work outside of the often-presumed causal chain from values to preferences to action.

Sjöberg (2000, p. 6) takes this critique a step further in his review of the empirical evidence supporting cultural theory and other value-based scales: “the success of Cultural Theory is largely an example of the persuasive power of speculation.” He criticizes the early work of Dake as being essentially a political attitude test that relates weakly to risk perception. More importantly, he concludes that as a general matter value scales are unrelated to risk perception. In the place of cultural theory he offers a more empirically defensible, cognitively-based model that focuses on the importance of the “properties of the hazards” and personal attitude, as opposed to cultural theory’s “abstract, far-fetched manner” of construction of social contexts (Sjöberg, 2000, p. 9). In this view, ideology

specific to the individual and the precise nature of the hazard in question predominate over the one-size-fits-all categorical approach taken by cultural theory.

This type of model appears to have presaged the work of Norgaard (2011, 2009), which focuses in part on how individualized cognitive mediation of risk influences how the interaction of climate information and both human and environmental identities translates into action. Even Dake (1992) criticized the over-emphasis of the five categories described by cultural theory, which was based on the assumption that these were the only categories of sufficient stability to represent viable ways of life. “Relaxing this categorical assumption,” he wrote, “does no harm to cultural theory’s core claims that worldviews and social relations are functionally interdependent, and it allows for a more sophisticated analysis of the role of belief systems and social cognition in the perception of risk” (Dake, 1992, p. 32).

Cultural theory, for all of these critiques, offers a number of points that are useful when applied to studies of perceptions of environmental risk. First, it recognizes that risk perception is socially constructed and attempted to create a plausible—if perhaps not empirically perfect—scale for understanding how culture affects risk perception. Second, while it can be criticized for its one-size-fits-all approach to culture, it also embraced a contextual approach to risk: “perception of danger is selective; it varies with the object of attention” (Wildavsky & Dake, 1990, p. 51). Third, in its very existence it supports the application of forms of sociological theory to environmental risk that at first blush may appear unrelated. For example, early discussions of catastrophic environmental risk by cultural theorists were influenced by ideas developed in the context of studies of Judgment Day developed by sociologists of religion: “where the language of sin appeals

to the authority of priests and divine law, the language of risk appeals to the authority of scientific experts and the prophetic powers of modern rationality” (Wilkinson, 2001, p. 4). Furthermore, by inviting in social cognition and belief systems Dake (1992), for example, helped to expand the scope of relevant theory. This work creates a precedent for the exploration of the application of other areas of sociology to assessments of environmental risk, even when such a connection may not be immediately apparent.

b. Risk Society.

The risk society approach focuses on the contemporary breakdown of the myth of humanity’s rational control of the environment through a growing “realization that industrially produced [environmental] risks are not only human-made but also uncontrollable and global in reach” (Anaïs & Hier, 2012, p. 1). As a central element it incorporates the failure of an actuarial model of uncertainty in light of the incalculable scope and potential frequency of certain environmental risks (Anaïs & Hier, 2012, Wilkinson, 2001). The magnification of catastrophic uncertainty “triggers a reflexive, rule-altering (rather than enforcing) orientation to human existence that is at once global and experiential in scope” (Anaïs & Hier, 2012, p. 1). Beck sought to relocate discourse on our relationship with environmental risks within a future marked by a salient threat of “self-annihilation” (Wilkinson, 2001) that forces reflexivity by “propel[ling] modern [people] into ‘self-confrontation’ with the consequences of risk that cannot be adequately addressed, measured, controlled, or overcome, at least according to the standards of industrial society” (Elliott, 2002, p. 297).

Elliott (2002) further distinguishes Beck’s concept of risk in modernity from how it was understood in earlier, more traditional societies. First, he describes Beck’s

conceptual distinction between “danger or hazard” as understood by traditional societies and “risk.” Risk involves an element of “instrumental rational control” that was evidently, in Beck’s view, absent in many traditional societies; whereas hazards and danger were a regular part of life, risk arises only from “an attempt to make the incalculable calculable” (Elliott, 2002, p. 298). The upshot of this is that, in Beck’s view, individuals living in the present day are required to become more intimately involved with risk analysis rather than merely deferring to tradition or established norms (Elliott, 2002).

The critique that follows questions whether it is possible to draw such a fine-line distinction between traditional and modern societies, and further questions whether Beck’s reliance on a “rationalistic and instrumental-calculative model of risk in micro-social and macro-social worlds” is appropriate (Elliott, 2002, p. 300). Among other conclusions, what emerges from this attempt “to stress the sociologically questionable assumptions concerning risk in Beck’s work” and “to tease out the more complex, nuanced, forms of risk perception” is an argument that Beck underestimated the resilience of tradition in his description of reflexive modernization. Whereas Beck viewed reflexive modernization as a “revising, or reinvention, of tradition,” Elliott argues for a more static view of the nature of traditional roles and ideologies in the field of risk perception (Elliott, 2002, p. 308). Therefore a tension emerges between the roles of reflexivity and deference to tradition, but each in its own way embraces the role of the individual and the local in risk perception.

Elliott (2002, p. 300) also posits that Beck’s model has “deep affinities with neo-classical economics and rational-choice theory, and thus necessarily shares the

conceptual and political limitations of these standpoints.” It may therefore stand to reason that a summary of later criticisms of the risk society thesis “imply...that Beck’s theory cannot grasp the hermeneutical, aesthetic, psychological and culturally bounded forms of subjectivity and intersubjectivity in and through which risk is constructed and perceived” (Elliott, 2002, pp. 300-01).

Like Elliott, Wilkinson (2001) questions Beck’s approach to individuals, but this time in the context of the effects of the media on the risk consciousness of the public. The risk society approach directs that the development of public risk consciousness is heavily influenced by the communications media. However, Beck appears to have ignored what is known in communications studies as the “impersonal impact hypothesis, which suggests that people separate issues identified by the media as problems for society from those which they identify as a problem for themselves” (Wilkinson, 2001, p. 13). Thus it is important to not conflate the perception of a personally problematic form of risk with a perception of a publicly problematic form, and to approach risk from the standpoint of the individual and the subject community.

While it would be infeasible to interrogate the full breadth of elaborations and critiques of the risk society approach here, from this brief review a few important observations emerge. Buried within risk society is a tension between traditional ways and ideological revision that is based not in an interpretation of risk, but in the very existence of risk as a describable modern concept. This also incorporates a tension about the extent to which tradition is resilient in the modern world and to what extent individual risk culture is the product of institutional forms or individualized (or otherwise localized) concern. Problems also emerge due to the emphasis that Beck places on the individual in

risk perception, ignoring some of the ways that risk is constructed within the complex of individual and community (Elliott 2002). As with cultural theory, an argument can be made that adherent of the risk society approach “fail to give due consideration to the fact that a partial perspective on the social reality of risk perception is woefully inadequate for conceptualizing the complexity of the cultural dynamics through which people negotiate the meaning of their world...[and] that this is to neglect a component of our understanding of social reality which may be vital for explaining the rise of ‘the risk debate’ in the public sphere of modernity” (Wilkinson, 2001, p. 16).

When viewed in combination with cultural theory a few additional common themes emerge. First, both schools of thought agree that culture matters and risk perception is, in some way and to some extent, socially constructed. While risk society may be more closely related to rational choice theory, along with cultural theory it reflects that risk is partially the product of the social world. Second, it is likely that no approach based purely off of one paradigm—cultural theory, risk society, or economic rationality—is sufficient to explain the range of responses to risk. Third, an over-reliance on any one approach runs the risk of minimizing the importance of context and nuance in individual or local-level responses to risk perceptions.

c. Approaches to Risk in the Natural Hazards Literature.

Risk is also addressed in the natural hazards literature. In a 1999 description of the history of the treatment of risk in this literature, Kathleen Tierney notes “that the complex issues regarding the study of risk” had “yet to develop a coherent theoretical framework from which to study hazards” (Tierney, 1999, p. 216). Commenting on the dearth of information produced within this field that might prove useful to the study of



hazards, she describes Beck's work, with its exclusive focus on "risks associated with technology in contemporary industrialized societies" as saying "almost nothing about natural hazards, which is troubling for those of us who see natural and technological disasters as having common sources" (Tierney, 1999, p. 216). She views the reason for this omission—Beck's distinction between technological hazards, about which he emphasizes the role of human decision-making in the name of progress, and natural disasters, which he views as not having a strong human decisional component—as representing a false dichotomy. Alternatively, she views natural disasters (or at least the effects thereof) as being "as much the result of decisions as those related to technology" (Tierney, 1999, p. 216).

She also discusses the development of cultural theory and psychological approaches to risk that depend in part on the cognitive shortcuts people take in risk assessment. This approach may illuminate "the ways in which risk perceptions of laypersons differ from the estimates offered by experts and from objective, empirical data" (Tierney, 1999, p. 218). Critically, she observes that the "net effect of this line of research has been to make individual and group perceptions a central consideration in the study of risk in the social sciences, to the neglect of other topics" (Tierney, 1999, p. 218). Seeking to remedy this disciplinary failing, she proposes analysis that extends beyond basic perception, incorporating social construction as well as organizational and institutional analysis. This would serve the purpose of understanding of "the views people hold on hazards, and the social production and allocation of risk" (Tierney, 1999, p. 219).

Importantly, another line of thinking recognizes that natural hazards risk is dynamic as a result of the dynamic nature of human decision-making. The production of knowledge about risks, therefore, is grounded in systems reflective of existing systems of power and institutional interests. Instead of social construction operating to diminish the institutional approach, the “argument that risk estimates are social constructs leads logically to the question of why particular risk estimates are selected and legitimated, rather than others” (Tierney, 1999, p. 222). Rather than adhering to the argument that “risk estimates merely need to be further refined so that they more closely reflect reality” she argues that “more relevant to this field is the study of processes through which risk-related phenomena are socially defined” (Tierney, 1999, p. 236).

With respect to the CSZ earthquake and tsunami, social issues have recently gained prominence in the geology literature but fail to address the full breadth of issues identified by Tierney (2007, 1999). For example, Wood et al. (2010) have developed a geospatial technique that uses census-block tracts to identify relative overlap of areas at high risk of loss of life from a tsunami and those with particularly vulnerable populations. This measure of social vulnerability is based on a number of discrete demographic factors such as wealth, age, employment, gender, and race. Building off of this base, in a follow-up study Wood et al. (2015) added the critical factor of the amount of time it would take to evacuate local tsunami zones.

Without diminishing the importance of work such as this that seeks to incorporate social vulnerability into hazard assessment, it is important to note that it employs methods of understanding social vulnerability that paint with a broad brush and are focused primarily on the needs of emergency managers and public education and

outreach. This is reminiscent of what Tierney (2007) critiques as a “command post” point of view that deemphasizes local context. On the other hand, it represents a move away from what she terms the “events based” perspective that tends to divorce the study of disasters from their social context. Extending this embrace of the social, an opportunity arises for the development of approaches to natural disaster risk that embrace developments in other sociological fields and advance their application into the realm of environmental change.

### CHAPTER III

#### NOVEL LOCALIZED APPROACHES TO RISK OF CATASTROPHIC ENVIRONMENTAL CHANGE

Since both cultural theory and risk society are best viewed as necessary yet insufficient contributions to our understanding of risk perception, following Tierney (1999) the question then becomes whether other aspects of cultural sociology might inform our understanding of how natural disaster risk is socially constructed and how it translates into action. For example, Norgaard (2011, 2009) studies the ways in which climate change denial is socially organized as an emotional protective mechanism. To this end, she utilizes the concept of a cultural “toolkit,” originally described by Swidler (1986) to explain how individuals employ pre-existing cultural tools—endowments of ideology, skills, and habits, including those drawn from various identities—to interpret and affectively manage knowledge about climate change. In many cases this affective management acts as the impetus for climate change denial in action, even among groups of people who do not deny the anthropogenic nature of climate change (Norgaard 2011, 2009).

This work, however, focuses on how the tools provided to people by “culture can provide resources for constructing strategies of action,” not on the details of the processes that motivate resort to cultural tools in the first place (Norgaard 2011, p. 11). This is not a critique. Instead, it emphasizes that the process of social settlement and unsettlement that Swidler (1986) describes as the lynchpin for the shift from the maintenance of tradition and a normal commonsensical way of doing things to the shift in ideology and strategies of action, have not been fully explored in the context of environmental risk.

a. Toolkit Theory: The Potentially Unsettling Nature of Environmental Change.

In this section a method will be described by which the potential effects of catastrophic events may give rise to the feelings of unsettlement that Swidler has described as causing the ideological and behavioral shifts through which people organize their behavior (Swidler 1986, Lizardo & Strand 2010). While in Swidler’s terms a relative feeling of settlement or unsettlement triggers the resort to the repertoire of cultural tools that have been developed socially and culturally, this effort seeks to identify whether the array of cultural endowments within a community influence whether the community feels unsettled in the first place, and if so in what way? Stated another way, if the potential for catastrophic environmental change—meaning socially constructed risk—can unsettle, how do the cultural and social endowments of a community influence the development of unsettlement, as well as the modes by which unsettlement comes to be felt? In this way risk perception might not be only the product of ideology or tradition (as cultural theory and risk society suppose) but generative of a tendency to maintain tradition or to resort to strategic ideological update in the first place. This will develop an

understanding of the potential motivational effects of a sense of impending environmental catastrophe.

Swidler (1986, p. 281) argues that “[c]ulture affects actions, but in different ways in settled versus unsettled periods.” In settled times people tend to rely on tradition and common-sense approaches to living their lives. Unsettled times, however, trigger a deeper ideological searching and the development of new ideologies that compete for social resonance as people develop novel “strategies of action.” She rejects the “‘unit act,’ the notion that people choose their actions one at a time according to their values or interests” as well as pre-existing theories that assumed a rational and pre-planned deployment of a set of tools from scratch based either on social experience or the then-existing context (Swidler, 1986, p. 276).

Instead, she describes something of a loose assemblage of cultural tools derived from varied individual experiences and ideologies that people (and their communities) employ to create strategies of action for daily life (Swidler, 1986, Schudson, 1989, Vaisey, 2009, Lizardo & Strand, 2010). This distinguishes her approach from a rationalist perspective like the one that arguably underlies risk society and those that inarguably underlie other common approaches to disaster risk, and tends to confirm the belief of cultural theory’s critics that values may not predictably translate into action.

Yet Swidler never concretely defines unsettlement, nor identifies precisely what might distinguish settled from unsettled times. Instead, she provides an example of how a slow accretion of scientific information that runs contrary to established “knowledge” may eventually reach a tipping point and trigger a paradigm shift in the form of a scientific revolution. This example, however, is inconsistent with her assertion that

settled and unsettled times exist on a gradient; social transformation in her view does not occur with the flip of a switch and an expert announcement of “unsettled!” Each of these challenges are faced by researchers focusing on climate change and other environmental disasters:

Distinguishing culture’s role in settled and unsettled periods, we can focus on those historical junctures where new cultural complexes make possible new or reorganized strategies of action. We can then ask how concrete structural circumstances affect the relative success of competing cultural systems (Swidler, 1986, p. 283).

The question of what distinguishes settled and unsettled times couples with the more basic question of whether cultural tools can serve a motivational purpose at all. Some of Swidler’s successors have interpreted the use of cultural tools as being purely for the purpose of justifying prior action (DiMaggio, 1997) while others argue that cultural tools can also serve a motivational function (Vaisey, 2009). Reviewing Swidler’s approach, Vaisey (2009), a proponent of a motivational role, notes that Swidler (2001) found that human beings are “remarkably bad at giving consistent reasons for their behavior” and, while cultural tools might constrain motivation—demotivating individuals from undertaking strategies of action for which they have insufficient social justification or cultural tools—Swidler “seems to realize that a needed account of motive is missing” (Vaisey, 2009, pp. 1678-79).

Attempting to remedy Swidler’s intentional or unintentional focus on the use of culture as justification rather than motive, Vaisey (2009) reframes the issue in the context of the dual modes of human cognition: the deliberative and automatic minds. Using the metaphor of an elephant on a rider, he contends that although the rider—the thoughtful, deliberate mind—might feel in control, the elephant—the automatic, intuitive mind based

in some sort of cultural value system—is really in control. He contends that this serves a simplifying function: the deliberative mind simply could not contend with the overwhelming array of information it receives and decisions it would be forced to make based on that information. Instead, the human mind tends to default to automaticity based in values (Vaisey, 2009). This is oddly consonant with a regular complaint in the climate change context: that the production of overwhelming amounts of climate information acts as an impediment to responsive action (see, e.g., Oregon Coastal Management Program, 2009).

Yet in response to Vaisey, Swidler (2008) reiterates her belief that people are more likely to act in ways that reflect the skills with which culture has endowed them—their cultural tools—than their values. More importantly, she queries the elephant metaphor for the purpose of questioning whether people have some sort of inherent value-laden moral intuition: “who or what trains (or indeed feeds or tends) the elephant over time? Without some substantive notion of where the intuitive judgments that...shape conduct come from...asserting that there are such judgments still says...nothing about the role of culture in shaping action” (Swidler, 2008, p. 617). The question of motivation, therefore, may come down not to deterministic intuition based on values, but on some other form of cultural input. Given this intellectual tension, taking a slightly different approach to Vaisey provides a clue about the avenue by which automatic cognition might embrace a motivational role in the environmental context: preservation of ontological security through the preservation of identities (Vaisey, 2009, Jaeger et al., 2001).

Developed relatively contemporaneously with the toolkit approach, ontological security refers to “the confidence that most humans have in the continuity of their *self*-

*identity* and the constancy of their *surrounding social and material environments of action*” (Jaeger et al. 2001, pp. 15-16, emphasis added). It provides, for Vaisey, support for the idea that “unconscious dispositions” may play a role in developing a “sense that the world is [a] *meaningful and stable*” place (Vaisey, 2009, 1682 emphasis added). Importantly, ontological security’s dual focus on meaning and stability elegantly reflects the nexus between sense of place and place identities—how people imbue physical and social spaces with meaning (Gieryn, 2000)—and the potential effects of environmental risk that threaten expectations of a predictable environmental future (Norgaard, 2011). Place identities and sense of place, which are discussed in greater detail below, merge the human and the geophysical and reflect a sense of constancy in both the social and physical world.

Perhaps unsurprisingly the ability of climate change risk—once perceived and recognized—to challenge ontological security has been described by Norgaard (2011) as one of the drivers of the emotional protective mechanisms that induce climate denial. It is intriguing to consider that environmental risk may in other ways (outside of the realm of affective mediation) consciously or subconsciously work to motivate change that either confirms or modifies existing social and environmental identities, and thus support or challenge ontological security and relative feelings of settlement.

Place and other identities, in turn, may influence both the tools available for deployment and the relative sense of unsettlement that that is felt based on the potential environmental change and risk through a challenge to local place-based ontological security. Thus environmental change and its potential to motivate based on a collection of identities fits neatly into the contention that the deployment of cultural tools should be



viewed as “having an unconscious component [intuition]...and a conscious component (our discursive ‘identity projects’)...[in order to] see how identities can be thought of—without contradiction—both as motives and ‘cultural tools’ that we can ‘pick up and put down’” (Vaisey, 2009, p. 1707).

However, linking environmental, social, and individual identities and allowing for the existence—albeit imperfectly defined—of a motivational use of culture and identity does not address the central question here: do the risks associated with future environmental change potentially set the stage for use of cultural tools in the first place? Indeed, it appears that Vaisey (2009) is still discussing the “back end” approach to the employment of cultural aspects of risk—what happens after a determination of settled or unsettled—instead of looking at a “front end” approach that considers how *perceptions of risk might influence the initial calculus of relative unsettlement*. Put simply, while Norgaard (2011) demonstrates that place identity may play a role once culturally-bound retooling has started as a result of unsettlement, questions remain about the full range of factors that can initiate the process of social change itself by creating, enhancing, or reducing unsettlement.

Lizardo and Strand (2010) provide the link that provides the necessary means of analysis of the “front end” role of risk perception. This occurs as part of an attempt to integrate Swidler’s toolkit approach with aspects of Pierre Bourdieu’s strong practice theory, particularly his ideas about how embodied social structures are produced not through discourse but by being “encompassed by” a certain social environment. “This results in the acquisition of a ‘taste’ for exposure to similar experiences at an...ultimately motivational level” (Lizardo & Strand, 2010, p. 211). Similarly to how peoples’

apparently idiosyncratic choices “can be shown to be anything but idiosyncratic” but based on social position, they theorize that Swidler’s observations about the problems people encounter in giving consistently good reasons for their behavior arise from their *a priori* lack of knowledge about appropriate behavioral criteria to deal with a new situation: they lack “explicit institutional prescription” for their actions (Lizardo & Strand 2010, pp. 214-15). Like Swidler and Vaisey, they “recognize the fact that persons are simply unable to report coherent accounts of the reasons why they engage in certain courses of action” (Lizardo & Strand, 2010, p. 205); this belies the argument that courses of action are based in a rationalist, deliberative approach.

Lizardo and Strand (2010, p. 216) use this observation about the level of institutional direction and cultural support—which they term “socio-cognitive scaffolding”—to develop a framework that distinguishes between relatively more and less settled contexts, which is described in greater detail in Table 1.

Furthermore, they do so in a manner that extends motivation beyond the automatic cognitive realm described by Vaisey and into the discursive consciousness (which they describe in tandem with the more automatic practical consciousness). More settled contexts are those in which there are relatively greater scaffolding. These are broken down into contexts in which behavior is heavily prescribed or directed—in these contexts tradition and common sense take the fore in shaping choices—and less prescribed contexts that exist between the “gaps” in social expectation where actors tend to engage in “regulated improvisation” (Lizardo & Strand, 2010, p. 216).

Table 1. A Representation of the Stages of the Breakdown of Socio-Cognitive Scaffolding.		
	Discursive Consciousness Level of Prescription or Recognition and Resulting Behavior	Practical Consciousness Level of Prescription or Recognition and Resulting Behavior
Stable, pre-existent socio-cognitive scaffolding	<p><i>Strong External Prescription</i> Quiescent, reliance on and cognitive exploitation of objectified institutional structures to generate and organize lines of action.</p> <p><i>Gaps in the institutional order</i> Active, “cognitively optimal” use of already existing and widely shared vocabularies of motive, reliance on “institutional myths” to explain action; loose coupling or “dissociation” between justifications for action and actual patterns of action.</p>	<p><i>Strong External Prescription</i> “Ontological complicity” between embodied habits and skills and objectified institutional orders, unconscious schematic transfer across institutional domains.</p> <p><i>Gaps in the institutional order</i> Production of globally coherent lines of action through “regulated improvisation” in unstructured choice situations; criteria of judgment refractory to discursive consciousness and hard to verbalize and “re-describe” into public language.</p>
Unstable (or non-existent) socio-cognitive scaffolding	<p><i>Early (before reflexive recognition)</i> Continued reliance on existing vocabularies of motive, cognitively optimal attempts to explain away anomalies.</p> <p><i>Late (after reflexive recognition)</i> Reflexive, “cognitively costly” search for and possible development of novel explicit cultural patterns (“ideologies”), rule-based, consciously monitored schematic transfer across institutional domains.</p>	<p><i>Early (before reflexive recognition)</i> Misfiring/hysteresis/allodoxia</p> <p><i>Late (after reflexive recognition)</i> Retooling/retraining/acquisition of new habits and skills/readjustment of future expectations.</p>
Imported and adapted from Lizardo and Strand (2010, p. 216).		

Where such scaffolding becomes less stable or non-existent the context gradually shifts into the realm of unsettled, which is divided into an early stage and a late stage. The early stage precedes full reflexive recognition of the unsettling circumstances and is marked by discursive attempts to “explain away anomalies” and a “false anticipation of the future...because the environment [people] encounter is too different from the one to which they are objectively adjusted” (Lizardo & Strand 2010, pp. 216, 221). This is followed by a later stage that is triggered by the recognition of unsettling circumstances,

at which point the difficult processes of cultural retooling and ideological reshaping originally described by Swidler (1986) commence (Lizardo & Strand, 2010). In other words, settlement and unsettlement in the context of risk may be better viewed not solely as the product of recognition of the risk itself, but also whether the risk fits within conceptions of normal circumstances for which people have established responses. In sum, they describe their elaboration on Swidler as:

We have substituted Swidler's "settled" versus "unsettled" binary for our current (and we believe analytically more precise) distinction between contexts in which actors can rely on externalized, stable cultural scaffoldings, and thus exploit the existing structure to guide their behavior by engaging in cheap, cognitively optimal heuristics at the level of discursive consciousness, and contexts in which this external scaffolding is absent or non-existent (e.g. periods of institutional change or transformation) and which reliance on more "cognitively costly" reflexive cognition becomes necessary. We have also differentiated between two kinds of "unsettled" based upon the timing and reflexive recognition of the agent that the taken-for-granted cultural scaffolding is still there or not. (Lizardo & Strand, 2010, p. 216, internal citations omitted).

This analysis serves a number of important functions in the context of the sociology of environmental change. First, this elaboration of the stages of relative unsettlement harmonizes the heretofore-apparent contradiction in Swidler (1986) between gradual movement from settled to unsettled and her example of a tipping point triggering a paradigm shift. Instead of there being a discrete moment of social transformation it is described as a process occurring over the course of time. This reflects the creeping catastrophic nature of climate change, as well as the potentially catastrophic yet temporally uncertain nature of earthquake and tsunami.

Second, this analysis provides an intuitively appealing rationale for the gradual divisions in American society that have been described by surveys focused on climate change values, attitudes and beliefs (see, e.g., Leiserowitz et al. 2013, 2008). For

example, a denialist who sincerely disbelieves the existence of climate change based on prior political or cultural commitments would likely remain settled (as what neither exists nor is perceived cannot unsettle) and therefore, per Swidler, only resort to common sense and established tradition to guide action. Moving across the gradient of climate change perspectives examples of regulated improvisation, attempts to explain away anomalies, false expectations of the future, and ideological update ranging from recycling to radicalization spring immediately to mind.

It is intriguing to consider that Lizardo and Strand's (2010) ideas could be used to create a systematic explanation for how perceptions of local environmental risk motivate the recognition of various states of change and reactions ranging from active and literal denial, to apathy, to individual or movement-based environmental activism. In this way it serves as a strong reminder that sociological thought may be extended into the environmental realm notwithstanding that it was developed to address other issues.

This is particularly salient because the blurry line between “settled” and “unsettled” is based on a mismatch of associative probabilities of an event occurring in reality and as it would be predicted based on past experience (Lizardo & Strand 2010): this reflects a state of uncertainty that only requires the addition of something of human value to be at stake to create risk (per Jaeger et al., 2001). Assuming a lack of institutional direction about how to approach the potential effects of environmental change—and this is more of a certainty in many contemporary communities than the effects of environmental change itself—uncertainty will inevitably lead to probabilistic mismatch except in the case of the most ardent denialist. In this way, a changing environment may implicate “previously developed modes of perception and appreciation

[that] are applied under circumstances when they are no longer objectively appropriate” (Lizardo & Strand, 2010, p. 221).

This is additionally important based on Cerulo’s (2006) argument that human beings are far better able to grade good outcomes and envision the best than they are at grading outcomes below a certain predetermined point of “unacceptable.” This “positive asymmetry” of perception causes us to be the worst at envisioning worst-case scenarios (Cerulo, 2006). In combination, it is possible that people will not only apply older responsive schemes to new situations even when due to the inherent uncertainty in climate change there is no “objectively” appropriate local response. Moreover, even when some metric exists that is objectively useful for the development of responses to catastrophic environmental change, such as those proposed by Prudhomme et al. (2010) or Wood et al. (2015), people would have difficulty appreciating how to apply those metrics to a potential worst-case scenario.

Thus Lizardo and Strand (2010) provide a theoretical basis for the argument that risk perception—via a mismatch in historically expected and actual environmental outcome—may act as a trigger for a gradual conversion from “settled” to “unsettled” times. Their approach provides an appropriate framework that allows for both gradual social change and an eventual tipping point of social transformation. This conversion includes the direction of elements of behavior, therefore addressing the observation that early forays into the cultural aspects of risk perception may help to explain beliefs, but not action. Moreover, they incorporate a “front end” motivational role of risk perception that may produce effects on both a discursive level and a more automatic level (Lizardo & Strand, 2010). Finally, it is worth noting that the concept of a mismatch of historical

and future probabilities that they import from the work of Bourdieu reflects the way that increased risk of flood and other environmental catastrophes are expressed: for example, a past 100-year flood event (or a one percent annual probability) is often be expressed after taking into account climate change as a 20-year, 10-year, or 5-year event (a rough correlate of a 5%, 10%, or 20% annual chance, respectively).

b. Cultural Tools Derived From Place: Place Identities.

While the foregoing discussion treated cultural tools in broad terms, it is worthwhile to explore potentially relevant sources of cultural tools that may assist in tracing the development of environmentally bound unsettlement. Two related areas of environmental sociology relevant to the question of what cultural tools are available to members of the public are sense of place and place identities. Each of these may impact levels of settlement and how a community reacts to more or less settled times. Sense of place and place identities are, in a basic sense, ways of expressing and measuring the feelings, meanings, and attachments that people develop in light of the physical attributes and social attributes of an environment, as those attributes are socially constructed (Greider & Garkovich, 1994, Gieryn, 2000, Motloch et al., 2000, Gustafson, 2001, Manzo, 2005, Stedman, 2011, Lin & Lockwood, 2014). In analyzing place, weight should be given both to a place's geophysical features and to the social meanings produced within them (Stedman, 2011). These meanings are neither static nor unitary, nor are they deterministically derived from their physical or social attributes of a place. Instead, Manzo (2005, p. 81) observed that in her study of residents of the New York metropolitan area "many places [became] meaningful through a steady accretion of experiences in them" and people "developed multi-faceted relationships with places that

sometimes transcended physical boundaries and coalesced around personal, emotional experiences.”

Importantly, notwithstanding that places may appear to be mundane or a mere backdrop to social life, they are generative of the thought processes that help to constitute identity: “Relationships to places reflect...their particular journey in the world...The places that people deemed important enabled them to sort out their thoughts and feelings, to work out their identity, to dream and to grow” (Manzo, 2005, p. 82). Indeed, people’s “stories about significant places serving as bridges to the past support the notion of continuity over the lifepath,” yet discontinuities and the effects of politics on place were also deemed important (Manzo, 2005, p. 82). Put another way: “Place saturates social life: it is one medium (along with historical time) through which social life happens” (Gieryn, 2000, p. 467). Yet Manzo (2005) emphasized the need to focus not only on the positives but also on potential negative associations with place, notwithstanding the apparent inconsistency between negative feelings and the often-used term “place attachment” (see also Trentelman, 2009).

Gieryn (2000, p. 481) suggests that due to the ubiquity of effects of the physical environment “sociologists should perhaps add place to race, class, and gender as a wellspring of identity, drawn upon to decide just who we are in an *already unsettled way*.” Place is not only generative of personal and community identities. Place and human identities are optimally viewed as recursively generative of each other:

Cultural groups socially construct landscapes as reflections of themselves. In the process the social, cultural, and natural environments are meshed and become part of the shared symbols and beliefs of the members of the groups. *Thus the natural environment and changes in it take on different meanings depending on the social and cultural symbols affiliated with it.* As a group’s definition of itself—the very essence of what it is to be



human—is renegotiated, so too is the definition and conception of the environment. (Greider & Garkovich, 1994, p. 8, emphasis added).

These feelings, however, do not exist in the ether. While it may be tempting to view social approaches such as these as invitations to dismiss the material environmental reality the meanings that underlie these factors both reflect material conditions and can express themselves materially over time. For example, Motloch et al. (2000) provide a vehicle for understanding how places develop distinctive and resilient characters and traditions that are based in part on their material endowments. The processes by which place character and tradition develop, bind, reconstitute, and recreate place and community identities in recursive fashion are based on historical conditions as well as their effects on decision-making over time. Through these structures, they create a “methodology for understanding the etiology of place distinctiveness: how places achieve coherence and how that coherence reproduces itself” by empirically tracing the historical development and reproduction of these elements (Motloch et al., 2000, p. 792). This historical perspective embraces the “diverse intertwining” of factors that create place distinctiveness: economics, “sentiment and symbolism,” culture, and others, while at the same time rejecting perspectives dominated by an economic engine or those based too heavily in sentiment and symbolism, instead focusing on an “action based and more comprehensive view” (Motloch et al., 2000, pp. 792, 794).

They develop two mechanisms that support place distinctiveness, as well as mechanisms for measuring them: lash-up, which is based in actor-network theory and is empirically traced by place character; and structuration, which involves the social reproduction of the tradition of a place over time as structures are built based on the priorities and constraints of its pre-existing character. “‘Tradition’ stands in for how that

character transforms over time—how a mode of conjuncture at one point constrains or enables a particular mode of conjuncture at the next” (Motloch et al., 2000, p. 793).

They conducted a lengthy analysis of the historical differences in the development of the cities of Santa Barbara and Ventura, California notwithstanding that each community has similar ecological endowments. While each had access to oil and beachfront, they outline how Nineteenth Century decisions about whether to emphasize the importance of oil or leisure-based economies were recreated and reinforced over the intervening decades, leading to Ventura’s contemporary industrial character and Santa Barbara’s character as the playground of the wealthy. Therefore the tradition of a place may be understood as its character as that character moves through time and recreates itself in modified form (Motloch et al., 2000).

Reflecting on these processes, Motloch and his co-authors offer an addition to how place character may interact with contemporary notions of hegemony and power:

For local individuals and groups with only weak resources, the weight of accumulating conjunctures, and the routines they imply, set the terms for adjustments that must be made—however unhealthy, inequalitarian, or otherwise troubling these adjustments are....It is not that a particular set of substantive and stable ideas ‘take hold’ in a place...but rather that so much can and does occur *as people react to arrangements that appear normal*....Given persistent hierarchies of wealth and ideological control in places, reproduction requires all local actors to make adjustments, *drawing on conceptions of place that have so durably come down*. People live within the accustomed modes of things coming together, acting towards them as “going concerns”...naturalizing them as we now say. Such arrangements are further ratified through the assumption that others will presume and act similarly. Individuals, as Bourdieu...remarks “*become the accomplices of the processes that tend to make the probable a reality*” (Motloch et al. 2000, p. 817, emphasis added).

It is important to bear in mind that place identities, whether couched in the descriptive terms of character, tradition, distinctiveness, or otherwise, are not simply the

result of social accident based on inputs over time that tends to reflect hegemonic structures. The development of place identities—and especially those related to industrial or strong economic interests—may be influenced by material conditions and may be strongly and directly influenced by those in power (Bell & York 2010). This influence may not reflect the contemporary economic importance of the industry to the place: for example, Bell and York (2010) mention the maintenance of a logging identity in the Pacific Northwest even as employment derived from logging declined, and describe active efforts by the coal industry in West Virginia to maintain a coal identity even as the importance of mine-based employment waned. Place identities are thus best understood as a constellations of meanings that are developed over time, may be developed automatically or deliberately, and reflect the full range of human interaction with the environment (including, in many ways, that environment's human components).

In addition, Motloch et al. developed, in the context of power and hegemony over the development of place over time, an idea similar to the automaticity in the face of overwhelming information development that Vaisey (2010) recognized as central to organizing thought. Their resort to tradition as an attribute of a settled existence, and the desire to maintain a sense of normalcy as people make decisions, is also similar to the framework provided by Swidler (1986), as elaborated upon by Lizardo and Strand (2010). As is discussed in greater detail later, the social construction of identities through reflections on historical conditions and recognition of contemporary contexts may both set the stage for development of community identities and preferred topics of discourse, and may reinforce the same (Zerubavel, 2006, 1997). Identities of place and the communities that occupy that place are thus closely linked and mutually interdependent,

and each is dependent on place, its material reality, and the social construction of the realities of the people that inhabit it.

The dual importance of historical and contemporary identities in how people create and maintain place identity to understand the nature of their environment is particularly important in Coos Bay given its resource extractive past—with an emphasis, although non-exclusive, on logging—and the recent gradual decline of the economic importance of logging in favor of other factors. These new factors, including tourism and transfer payments from retirees, may be just as environmentally dependent as resource extraction due to their basis in the areas aesthetic potential, although that dependence expresses itself in different ways (Robbins, 2006, Huppert et al., 2003). The same may be said for other attributes of place identity such as identification as a small town featuring relative safety, or as a place inhabited by groups of people who adhere to different ideological priorities. In any case, it is important to recall that tradition—the point of origin for changes in strategies of action described in Swidler (1986) and Lizardo and Strand (2010)—exists as a dynamic reflection of the character of a place and the meanings that character encompasses for its residents.

c. The Social Construction of Uncertain Environmental Change.

With the perception of future environmental risk now potentially occupying a generative position within a framework of social responses to catastrophic environmental change, the operative question becomes *how* risk of future and often uncertain environmental change is socially constructed. Social construction is the process by which “material realities gain meaning through social interaction” (Pettenger, 2007, p. 6). Framed more simply, in this context it is an attempt to expand upon the pure material

realities of environmental change to analyze how they are *understood* by potentially impacted people through the exchange of ideas and thought (Gergen, 1999, Pettenger, 2007). This does not deny the importance of material reality; rather, it emphasizes that the way in which people understand their world is dependent both on material reality and on how we describe, explain, or represent such realities as part of human relationships (Jaeger et al., 2001, Gergen, 1999). It therefore makes sense that place identity encompasses both the underlying geophysical reality and the social aspects of its construction.

In practice, these social relationships may manifest in the amplification or risk or its attenuation. Whether risk is amplified or attenuated can occur through selection of messages and ideas that are consistent with previously held values and beliefs and may be personal or the product of group association: “Individuals in their roles as members...of social groups...do not follow their personal values and interpretive patterns alone, but perceive risk information according to the rules of organizations and groups with which they are associated” (Jaeger et al., 2001, p. 172). Thus, the basic way that we conceive of material reality, and our assessment and interpretation of risks that it presents in and individualized or group context, is fashioned by our social relationships, allegiances, and communication within these boundaries (Gergen, 1999, Jaeger et al., 2001). Social constructionism of this sort has also been applied to the study of disaster:

The social constructionist approach to disasters, which is related to the constructionist perspective in the social problems literature...argues against viewing disasters as objective physical phenomena with given properties and impacts [and instead focuses on how] defining and labeling hazards and disasters...are socially produced through organized claims-making activities (Tierney et al., 2001, p. 17).

The early history of a social constructionist perspective in earthquake studies—primarily the work of Stallings (1995)—focused on organized claims-making activities at the institutional level by disaster professionals such as scientists and government functionaries (Tierney et al. 2001). “In the virtual absence of public concern,” notes Tierney (2007, p. 508), “the interests of [these actors] converged in the 1970s, resulting in at least the partial construction of earthquakes as a social problem.”

Much of the value of these contributions was based in their support for a shift away from a single-faceted events-based approach by placing emphasis on the multiplicity of social and environmental factors that affect planning and response, including the social conditions in which “disasters themselves originate” (Tierney, 2007, p. 509). Yet notwithstanding the importance of this development, the disaster scholarship that followed has been criticized for an emphasis on the “command-post point of view [that] privilege[s] the disaster narratives of official organizational informants over those of victims and community based groups” and ignores, to a degree, social justice concerns embedded within these communities (Tierney, 2007, p. 515). Outside of the earthquake field, similar efforts to understand the social construction of climate change related risks have commenced to “illustrate changes in values, identities, interests, strategies, and policies that a focus on material forces alone cannot explain” (Pettenger, 2001, p. 12, Norgaard, 2011).

Discussing the next steps in the development of the sociology of disaster, Tierney (2007, p. 519) argues in favor of a shift towards the development of sociological theory through disaster research, instead of only applying theory developed in other fields to disaster, and for greater disciplinary linkages both within sociology and without:

Disaster research can be linked with any number of sociological specialties and theoretical orientations; the possibilities are endless. However, perhaps the most logical initial strategy is to develop more productive interchanges with close neighbors—that is, with other specialties that explore social phenomena that resemble or overlap with disasters. Chief among these specialties are the study of risk, organizational research on accidents and disasters, and environmental sociology. This is not a call for more middle range theory; rather, it is a call for extensive efforts to overcome the conceptual gerrymandering that has hampered larger-scale theory development.

The study of risk is itself a multidisciplinary field that focuses on disaster-relevant topics such as risk perception, the social construction and social amplification of risk, risk assessment, and risk management, both in specific societies and in cross-societal and comparative contexts....

Calls for expanding the interdisciplinary purview of the sociology of disaster are not merely focused on the development of theory. Early forays into the social construction of disaster produced tangible policy results: “[a]s new negative disaster effects were constructed, additional needs were identified, and new aid programs often followed” (Tierney, 2007, p. 507). Gergen (1999) argues that the maintenance and development of cultural traditions and relationships “depends on a continuous process of generating meaning together” in order for “traditions to remain sensible.” He then mirrors the contention that social constructionism can support tangible results:

At the same time, constructionism offers a bold invitation to transform social life, to build new futures....If we long for change, we must confront the challenge of generating new meanings, of becoming *poetic activists*....Invited are *generative discourses*, that is, ways of talking or writing...that simultaneously challenge existing traditions of understanding, and offer new possibilities for action. (Gergen, 1999, p. 49, emphasis in original).

With an eye towards developing a new theoretical framework based in a localized social construction of risk, as applied through the lens of the sociology of culture, it is essential for a poetic activist to understand how communities and individuals

characterize and understand risk by resort to cultural traditions. In this way it may be possible to better understand how these narratives and discourses interact with the material reality of disaster and how, through the amplification or attenuation of the sense of risk, they may influence unsettlement and therefore calls for revision of strategies of preparatory action.

In the context of Coos Bay, however, an additional complication emerges: that the risks presented by climate change and earthquake are contingent and uncertain as to scope, magnitude, and timing. Accordingly, the material environmental reality of this context directs that any analysis of social construction must focus on how individuals and communities create narratives and discourses about anticipated *future* events using what they know and believe, which on an individual or community-wide basis may or may not accurately reflect the state of the art in scientific understanding of these events. In this sense, it is critical to recognize that, while it is indeed important to understand what people know and whether it accurately reflects applicable science, it is also important to empathetically endeavor to understand what people believe and why they believe it, particularly if this belief contradicts science.

All predictions of the future involve an element of subjectivity; this re-emphasizes and reinforces the importance of empathetic assessment of what people know and believe in order to discover how these processes influence planning and preparedness activities. This is not the same as questioning the necessity or validity of the science. As described in the sections that follow, understanding of the predictions of scientists only provides the foundations for perspectives on environmental change: while these foundations are indeed critical for the structural integrity of the complex as a whole,



they often do not tell us much about what the complex looks like or its pattern of habitation.

d. Remembering the Future: The Social Construction of Future Events.

The way that people process and create memories is the product of social environments and interactions. Using ideas developed in the field of cognitive sociology of perception, memory, and denial, it is possible to develop an argument for how the social construction of the future is analogous to the ways in which we remember past events at which we were not present, but that are important for our communities. This process, which I term “Remembering the Future,” is based in large part on the work of cognitive sociologist Eviatar Zerubavel (2006, 1997). While autobiographical memory refers to events at which an individual was personally present and can relate the events from a first hand perspective. Zerubavel (1997) describes people’s collective memory of events at which they were not present as *socio-biographical memory*. Events captured in socio-biographical memory are “remembered” through the “mnemonic communities” to which an individual belongs (Zerubavel, 1997, pp. 90-91).

Socio-biographical memories are not limited to events in which all of some of the members of a community were present. In contrast, and as opposed to firsthand accounts of events personally experienced, they mediate more spatially or temporally distant events that affect the subject community. They may express themselves in “the sense of pride, pain, or shame we sometimes experience as a result of things that happened to groups or communities to which we belong before we even joined them” (Zerubavel, 1997, pp. 90-91). These “socially mediated memories...are based entirely on secondhand accounts of others” and are influenced both by pre-existing identities and the form of

information that is available to be passed on, be that oral tradition, recorded versions of events, or otherwise (Zerubavel, 1997, p. 90). They allow communities to interact with their collective past are both the product of, and generative of security in, community identity (Zerubavel, 1997).

An example of how people remember events based in secondhand narratives or information is our experience with the events of September 11, 2001. Many people who were not present at the World Trade Center on that day still have a socio-biographical memory of the events that occurred there. They can recite facts acquired secondhand or describe visions of destruction passed through the media even though they were thousands of miles away. Moreover, it is not only members of communities with concrete ties to affected areas that share these memories, and it is plain to see from that most basic Google search that different communities, even in the United States, have formulated different narratives of those events based on pre-existing social and political commitments. It is also evident that those experiencing and remembering those events may be dependent on a multiplicity of communities of thought created by different means of cognitive socialization (Zerubavel, 1997).

It is important to distinguish individual memories from the related yet distinct concept of collective memories. While individual memories are certainly subject to cognitive filtering in terms of what they emphasize and minimize, “the collective memory of a mnemonic community...includes only those [memories] that are shared...” and are thus influenced by mnemonic conventions of the group as a whole (Zerubavel 1997, p. 96). Thus, in understanding collective memories it is critical to distinguish between those memories held by an individual or perhaps a few people, and those held

and commemorated collectively. When many people share the same freely associated memories of a particular event or concept (i.e. associating particular presidents with the concept of “American history”) “it...underscores the tremendous significance of mnemonic socialization” (Zerubavel 1997, p. 96).

It would be a mistake to take an essentialist approach that elevates the primacy of material reality, community structure, or individual traits such as personality in the creation and maintenance of narrative. Likewise, it would be a mistake to assume that narratives formed socially within a community are somehow insulated from identity and behavior. Somers (1994, p. 618, emphasis in original) describes what she terms “ontological narratives” as being, “above all, social and interpersonal” existing “interpersonally in the course of structural and social interactions over time.”

[U]sed to define who we *are*; this in turn can be a precondition for knowing what to *do*. This ‘doing’ will produce new narratives and hence new actions; the relationship between narrative and ontology is processual and mutually constitutive. Narrative *location* endows social actors with identities—however multiple, ambiguous, ephemeral, or conflicting they may be (hence the term *narrative identity*)...Ontological narratives process events into episodes. People act, or do not act, in part according to how they understand their place in any number of given narratives—however fragmented, contradictory, or partial (Somers 1994, p. 618, emphasis in original).

These ontological narratives are based in part in what some term “tradition” but Somers (1994, pp. 618-19) describes as “public narratives”: “those narratives attached to cultural and institutional formations larger than the single individual, to intersubjective networks of institutions, however local or grand.” Without much theoretical stretching place may be added to this list of applicable identities.

Within the domain of ontological narrative and related public narratives lie the keys to a number of the theoretical frames previously discussed. Narrative—the stories

that people within a community tell, and more importantly the stories they believe—help to constitute the ways that people conceptualize the world in which they live. Nor, in a manner reminiscent of Swidler (1986) and the more recent history of natural hazard risk studies, is action necessarily based in rational calculation or some sort of categorical assumption about personality differences. Through reconstitution of ontology it appears that narratives have the capacity to unsettle, provided that new narratives challenge ontological stability. The subject identities found in a community are also bound into this matrix; but like the narratives themselves it dispenses with the requirement that multiple identities or narratives be internally coherent or consistent. Therefore, it is important to remember that place identities and community and personal identities may be related and mutually constitutive, with the full breadth of social relations potentially subject to emplacement (Gieryn, 2000, Greider & Garkovich, 1994).

Individuals and communities thus construct memories of past events at which they were not present, and often events that took place long before they were born, through mnemonics and narrative. Rather than be sterilely tucked away into the recesses of the mind as a mere story, the narratives that communities develop affect action and the material future reality within which a community will find itself. Furthermore, that “narratological pluralism often generates discord...reminds us that our memory of the past is not entirely objective....[y]et [that] mnemonic battles usually involve not just individuals but communities...suggests that the past is not entirely subjective either” (Zerubavel, 1997, p. 99). The similarity of this intersubjective approach to the mixture of material reality and social construction in the analysis of future disaster is unmistakable.

Accordingly, it is intriguing to consider that this analysis of how we socially negotiate memory of past events—through a combination of objective and subjective factors—may also apply to future events, at which no one has yet been present. This is because individuals and communities have already constructed narratives based on available scientific—or non-scientific, as the case may be—information. Could this “memory” of future events bind and reinforce community identities just as memories of past events can? This concept—remembering the future—requires analysis not only of the stories told by individuals, but analysis of stories or thematic types of stories that are shared by multiple community members.

Even putting aside for the moment the direct effects of political and similar commitments, the narrative analysis of memories of the future is complicated in the present circumstance by the fact that this analysis necessarily involves what is left unsaid. In a later work, Zerubavel (2006) analyzed the social construction of silence and denial through social negotiation of appropriate and inappropriate topics of conversation, as well as the means by which communities create and reinforce these discursive boundaries. Arguing that what we socially *avoid* was at that time an undertheorized area, he begins by recognizing the difference between the private act of noticing something and the public act of acknowledging it. Denial—and the related concept that he terms a “conspiracy of silence”—involve a mixture of individual and collective effort and is based in the avoidance of trauma, fear, or shame (Zerubavel, 2006).

Like the mnemonic construction of memory, what we choose to ignore or deny is also dependent upon a combination of personal factors and adherence to community norms. These are based on relative passively applied rules of relevance or irrelevance that

determine whether something is noticed in the first place, more active rules that determine what is acknowledged and what is ignored, and other rules that determine what we consider noteworthy versus what is deemed background noise (Zerubavel, 2006). “Separating the ‘relevant’ from the ‘irrelevant’ is a *sociomental* act performed by members of particular social communities who are socialized to focus only on certain parts or aspects of a situation while systematically ignoring others” (Zerubavel 2006, p. 25, emphasis in original). Through social processes familiar to all, such as taboo and tact, such mores are preserved, as is the negative disquiet that may be expected for their violation (Zerubavel, 2006).

Denial goes one step further than the mere act of conspiring to maintain silence about a *verboten* subject or event. Meta-denial is the process of “denying the denial” by refusing to converse about the existence of denial in the first place. “Unlike when we explicitly agree to not talk about something...the very fact that that the conspirators avoid it remains unacknowledged and the subtle social dynamics underlying their silence are thus concealed (Zerubavel, 2006, pg. 52-53). A number of discrete factors are identified as influencing the likelihood that an individual will participate in such a conspiracy. First is the proximity of the individual to the subject matter of denial. Second are the level of social proximity between potential conspirators and the level of political difference between them. Closeness in each of these categories implies greater trust, and thus a reduced tendency to resort to denial (Zerubavel, 2006).

Yet the factor “that most dramatically affects the likelihood of participating in conspiracies of silence is the actual number of conspirators involved” (Zerubavel 2006, pg. 54). This is because “it is psychologically much more difficult to trust one’s senses

and remain convinced that what one sees or hears is actually there when no one else around...seems to notice it” (Zerubavel 2006, pg. 55). By means of feedback between members of a community, denial and silence are thus self-reinforcing until someone breaks the conspiracy of silence by “making the...presence [of the previously avoided topic]...part of the public discourse” (Zerubavel 2006, pg. 55).

Among the reasons that individuals choose to maintain conspiracies of silence are altruism and the avoidance of isolation through preservation of group cohesion.

Altruistically, people may recognize that breaking conspiracies of silence may threaten the “cognitive tranquility” of their peers, upsetting them by potentially unsettling their worldview (Zerubavel 2006, p. 74). Similarly, disruption of social systems through disclosure of this type of information can potentially alienate the former conspirator from the group and disrupt group cohesion. Interestingly, maintenance of denial can also create a sense of isolation borne from the dissonance between what a person observes and what their community acknowledges. This results in “large amounts of social energy [being] consumed in our effort to avoid noticing or speaking about them,” a process that can both undermine group cohesion and create dysfunction (Zerubavel 2006, p. 83).

Although he specifically focuses on denial and conspiracies of silence, what Zerubavel (2006) was discussing more generally were norms of conversation and discourse and how they influence the generation and preservation of information. Coupled with his investigation into the operation of socio-biographical memory and the observation that our perception of future events is necessarily at least partially subjective, I argue that the way in which appropriate discourses are developed for how people “remember” the future of environmental change are similarly socially constructed and

determined. Zerubavel (2007, p. 58) himself alludes to the same in the context of denial, arguing that silence is how an entire society may come to “collectively deny...impending environmental disasters.” Furthermore, the narratives through which memory operates and that influence the rules of discourse through which memories of the future are produced and socially supported are the product of the basic way by which people imbue their place with meaning by reference to antecedents grounded in history and identity.

The way these future memories are constructed can unsettle by multiple means: acknowledging risk can of course unsettle through fear of the risk itself but evidently denial of risks can also unsettle, although by the different mechanism of social disruption. This complicates the analysis of a gradual process of unsettlement based on acknowledgement of environmental risks based on Lizardo and Strand (2010), because it suggests dual sources of unsettlement based in somewhat opposing modes of dialogue. More importantly, the melding of these ideas in the context underscores that discourses and narratives matter both to collective understanding and to the creation of a collective in the first place. What remains unsaid or is filtered through socially generated rules of discourse may be just as relevant to the way that people think about what has not yet happened as what is said. Changing the subject or its frame away from one matter and towards another is therefore a powerful discursive tool that is not only a matter of taboo tact, also one of power (Zerubavel 2006). Remembering the future, then, is not only a process of what we endeavor and agree to remember and commemorate, but what we also conspire to misremember or forget.

Following both the calls to better integrate disparate disciplines within sociology in the context of environmental disaster, and the desire to better analyze local nuance in



risk perception, in this study I develop a number of mechanisms by which members of a coastal community who are cognizant of a chance of severe environmental risk socially construct the way that they remember the future by reference to the past and the present. The concept of future memory has been developed using Zerubavel's (2006, 1997) thoughts about the intersubjective and subjective development of memories about events at which the memory-holders were not present.

Moreover, I analyze how an assortment of these processes have led to discursive divides in the community that reflect both personal perspectives and a milieu of local place identities grounded in, and driven by, historical and contemporary conditions. Tracing what is said is also a means of tracing what remains unsaid: discursive modifications can alter the overall thrust of discourse. In many ways this is a study of discursive displacement. How do discourses displace the unsettling nature of the material reality of environmental catastrophe and how might the deployment of "chunks of culture" (Swidler, 1986, Lizardo & Strand 2010) influence the development of these unsettling-narratives? Overall, the goal of this analysis is to better understand how members of a community facing two types of potentially adverse environmental change create, negotiate, and maintain their understanding of this change, and how that understanding may influence the choice to resort to responsive preparation.

## CHAPTER IV

### METHODOLOGY AND METHODS

This project employed certain techniques based in grounded theory, particularly its emphasis on open-ended interviews and allowing collected data to influence the direction of research. Grounded theory embraces the co-development of data and theory,

in the sense that qualitative interviews are used to determine response patterns that invite and direct further development of theory (Charmaz, 2006). In line with the vision of Tierney (2007), the overall purpose of this process has been to identify means by which members of local communities socially construct their vision of future environmental risk and uncertainty, employing questions focused on both climate change and earthquake risk.

a. Participant Recruitment.

Over the course of the summer of 2015, in-depth, qualitative interviews were conducted with 25 residents of Coos Bay, Oregon, and its immediately surrounding locales. Participants were recruited using snowball sampling that began with approaching a number of community service organizations. With particular assistance from one chapter of one such organization, participants were recruited and were invited at the end of each interview to suggest other people who they felt had a strong sense of the local community and would be willing to participate. Partly due to the demographics of members of this particular club, however, it soon became apparent that my sample group was skewing towards relatively affluent men over the age of 50. Accordingly, in order to include a range of perspectives reflective of a more demographically diverse group, I actively sought participants from less-well represented groups by emphasizing this concern while asking for referrals as well as by seeking out an additional organization that offered a more demographically diverse membership to assist with recruitment.

This led to contacts within the local chapter of an organization focused on outdoor recreation and environmental stewardship who provided assistance in approaching members; working with this organization resulted in a significant balancing of age and

gender in the participant sample. The final participant cohort consisted of 12 males and 13 females. Participant ages range from 29 to 70 years old, with a mean age of 51.4 and a median of 56. Nine participants were under the age of 40, ten were between the ages of 40 and 64, and six were aged 65 years or older. All interview participants reported that the Coos Bay area was their place of year-round residence at the time of the interview. The average length of residence or at least a strong association with the area (i.e. as evidenced by home ownership, even if the area had not always been a full time residence) was 22.2 years, with a minimum of two years, a maximum of 66, and a median of 20. Five participants had lived in the area for less than ten years, seven for between 10 and 19 years, four for between 20 and 29 years, six between 30 and 39 years, and three for 40 years or longer.

Six participants were born and raised in the area or at least spent significant time in the area prior to adulthood. For those who had moved to the area, the reasons were diverse and often complex. For example, some participants came to the area originally for one reason yet decided to stay in the area for an entirely different reason, or gave multiple reasons for the decision. In addition, some participants may have originally decided to move to the area or to stay there for one reason, but subsequently have developed an appreciation for other aspects of the area that demotivated any desire to leave. The primary reasons why people moved to the community or decided to stay there involved an appreciation for natural recreation and amenities or for employment. This was followed by an appreciation for a small town feel—as one participant put it an “acoustic version” of big city life—and family obligations.

Although Coos Bay is overwhelmingly white at 87.1% (United States Census, 2010), and no question focused on race, a few participants mentioned how they identify racially (one Latina, one of Asian descent) and I believe that the sample is at least somewhat consonant with the overall racial makeup of the area. That said, a significant regret is the evident lack of any participants from the local American Indian tribes; although some participants may have identified as members of these tribes no mention was made of this during the interviews. In future research I would like to include a broader diversity of ethnic and racial perspectives notwithstanding that this may require a restructuring of the interview process.

A second weakness in capturing the full diversity of the community involves socio-economic status. The title of William G. Robbins (1998) fascinating history of Coos Bay—*Hard Times in Paradise*—underscores the potential importance of economic hardship in the area and future research should also endeavor to engage with a more representative socio-economic sample of the community. As of 2010 about 18% of the population of the city of Coos Bay lived below the poverty line (United States Census Bureau, 2010), and participants often mentioned the level of poverty and its associated social ills. Perhaps incident to the privilege that is sometimes bound together with community service and more generally free time—one taxi driver who I approached for an interview declined by explaining that he spent 12 hours per day working—I believe that my sample may have been inordinately focused on the more affluent.

A 2000 survey described by Huppert et al. (2003) indicated that 68% of respondents in the Coos Bay area were unemployed or retirees. Although this data is difficult to apply because it aggregates retirees and the otherwise unemployed in an area

with a large number of retirees, and because local demography may have changed in the intervening 15 years, it suggests that the fact that in my study all participants described themselves as employed or retired may be problematic. This was despite efforts to approach and discuss these matters with participants from other socio-economic groups. In some cases these efforts were successful. Furthermore, a number of participants who might rightly be described as affluent discussed less affluent times in their lives.

While six participants reported that they were retired and none of those were born and raised in the area, only four of those were in the cohort aged 65 or above. The remainder of the study participants reported a diversity of employment including non-profit managers and small entrepreneurs, fishers and cooks, consultants, and workers in a number of other fields including tourism, public health, medicine, business, education, and science. This final category was particularly interesting, as five participants either were working or had worked professionally as natural scientists and three more reported scientific training notwithstanding a vocational focus other than scientific research.

The choice to use organizations focused on community service in recruitment was made to help ensure that participants had, first, a particularly strong sense of community and potentially well-developed reflections on matters deemed to be of importance to the community, and second that they had assumed leadership roles in the community. Many community leaders from the fields of politics and government, business, community service, and local economic development were interviewed, as were a host of local professionals who had made significant personal commitments to the community and seemed intimately aware of the panoply of issues it faced. However, to avoid the “command post” bias described by Tierney (2007) I endeavored to avoid the temptation

to focus solely or even primarily on individuals who were active in local politics or who were otherwise professionally involved in emergency management.

The interview participants described a wide range of life experience and expressed a wide range of political and social viewpoints across the spectrum of American life. Often these viewpoints contradicted absolutist stereotypes present in contemporary political discourse. For example, many participants might rightly be described as environmentally and socially liberal, yet expressed views of the appropriate role of government and government spending that trended towards conservative. Accordingly, and notwithstanding the demographic issues previously noted, this study incorporates a diversity of opinion from a number of different, and often overlapping, communities of thought that are found in this community on the coast. However, it is worth remaining mindful that the process of recruiting through these organizations may not have offered a perfectly representative sample of the population of coastal communities in general, nor of the Coos Bay community as a whole, and no such claim is made.

b. Interview Structure.

The interviews were structured to first, discuss participants' history in the community, including length and type of residence (i.e. seasonal or full-time), employment history, what drew them to the community or motivated them to stay in the community, other places they have lived, whether they like the community, how they define their community itself, and outside communities with which they have strong connections. Identifying their definition of community was embedded in a method in which questions about the community were presented without any initial direct inquiry

into how the community is defined. This tacit exploration of community was intended to allow participants to define their community or communities fluidly, as opposed to designing questions suggesting a single or even a set array of types of community. This section was intended primarily to assess what the participants view their communities to be and to provide background about the development of the participants' opinions and outlook.

In an effort to understand participants' sense of place and identities associated with place, a second set of questions focused on their interactions with the surrounding natural and built environments, and the feelings and meanings they associate with the local area and environment. As with "community," the questions avoided predetermined definitions of terms like "environment" or "area" to allow participants to embed their definition of each term and the subjectivity attached to these definitions in their answers. Clarification was only sought if the definitions of these terms were not clear from the initial responses. Through this process participants could express the meanings that they associate with the local environment, be they social, personal, economic, aesthetic, or otherwise, while minimizing the effects of prompting on outside assumptions. Accordingly, these responses often were reflective of their interactions with the environment and how they imbue physical and social spaces with meaning.

Participants were also invited to discuss whether they thought that their viewpoints were shared by others, as well as the substance of conversations about the environment among themselves and others in the community who either agreed or disagreed with their views. This was intended to assess patterns of meaning—whether abstract or embedded in more tangible observations about use or value—that were held in

relation to the local place and environment (however they happened to define these terms). A final line of questioning attempted to connect their observations with their understanding of the most important moments in local history, to get a sense of how each participant viewed the historical development of the area.

Following the question about significant historical changes, a final set of questions addressed perspectives on contemporary and potential future change along the coast. As with the previous two sections, this line of questioning began with an open-ended approach to change and uncertainty, which gradually became more focused on physical environmental change. This was intended to help analyze the salience of different forms of change and uncertainty; for example, some participants chose to respond to the initial question about coastal change with descriptions of their reasons for optimism or pessimism about economic development while others spoke about demographic shifts in the population while still others spoke about change to the physical environment.

Questions in this section were intended to shed light both on what participants know or believe about the material reality of environmental change, but also how they interact with potential changes. Later in the interview process, after the salience of the CSZ earthquake and tsunami had been recognized, a question was added that inquired as to the length of time that the participant had been aware of the possibility of this event. A final question inquired about their views on who is responsible for planning and preparation for the possibility of incremental and catastrophic change.



c. Transcription, Coding, and Analysis.

While interviews varied from about 30 minutes to 90 minutes, a vast majority of the interviews were between 45 and 70 minutes in length. Each interview was transcribed and coded, first by means of an open coding process in which participant responses were assigned a code, followed by a more focused coding process in which coded statements were organized into categories based on the general focus of each. These codes were analyzed and placed into conceptual categories for further analysis of meaningful relationships within and between these categories. Coding produced 16 conceptual categories that covered a broad range of social and environmental perspectives and included a number of subordinate codes. These categories were then analyzed for internal discursive consistency or inconsistency, as well as interactions with other categories. Because coding categories often overlapped and influenced each other, special attention was paid to the interaction and overlap between coding categories.

d. Development of Project Focus Over Time.

Initially this project was designed to assess perspectives on environmental change through a climate change lens only, and how sense of place and place identity influenced these perspectives. Analytical variability was intended to be grounded in perspectives that focused on what was assumed to be the more familiar risk of climate change related flooding, and the presumably less familiar risk of potential releases of toxic substances from terrestrial industrial sites as a result of that flooding. It soon became clear that while generalized coastal flooding was indeed familiar, so too were problems with terrestrial toxins washing into the Coos Bay estuary! Accordingly, early in the interview process it became evident that perspectives on these two climate-change related events were quite

similar and the effort to think of the two in terms of different levels of familiarity would likely be fruitless.

Fortunately, the flexible nature of the interview design accommodated the desire of participants to discuss a different and apparently more salient topic than climate change: the potentially catastrophic CSZ earthquake and tsunami that is overdue on the Oregon coast. Coos Bay is littered with evidence of official concern about a tsunami in the form of blue evacuation route signs. During the spring and summer of 2015 the issue gained a greater public profile due to a number of media reports. In April, in an article titled “Tsunami poses risk to almost 100,000 on West Coast,” CBS News picked up an academic article published by Nathan Wood of the United States Geological Survey and his colleagues that outlined the threat to the Pacific Northwest coast, as well as cultural and other impediments to effective preparedness (Casey, 2015, Wood et al., 2015).

This was followed in July by an article in *The New Yorker* magazine titled “The Really Big One” that brought greater public awareness to the issue (Schulz, 2015) and another CBS News article that stated that “[s]eismologists predict [that the CSZ event] will be the worst natural disaster in North American history” (Kashdan, 2015). Finally, in October Oregon Public Broadcasting (OPB) premiered a documentary on the earthquake and tsunami threat, as well as the lack of coastal preparedness; in keeping with the growing tradition of subtlety avoidance, it was titled “Unprepared” (OPB, 2015). Yet these issues resonated beyond the sphere of coastal residents and the media: after only a few visits to the coast I found that I had developed a constant awareness of the most efficient route to high ground.

It was therefore unsurprising that when asked about change to their physical environment the minds of residents of Coos Bay migrated to the earthquake and tsunami, but this salience was not solely the result of recent media coverage. Many study participants were strikingly familiar with local geology, explaining processes such as the possible liquefaction of the marsh fill on which some of the City of Coos Bay—which was originally known as Marshfield—is built, that in their view will compound the destructive effects of the earthquake and tsunami. At this point a second question developed: how to understand how people who recognize and understand this risk continue to live in an area that has been widely reported to have a 37% chance of the next big one occurring within the next 50 years (Casey, 2015)? The inclusion of the threat of earthquake also introduced significant variability between the more incremental nature of climate change risk and the rapid catastrophe of the CSZ earthquake. Moreover, this variability extended to the differences in range of expected material realities that will manifest, and in the different levels of politicization of climate change and earthquake discourse. While it is not a goal of this project to compare and contrast these patterns of politicization, the extra variability may serve as a control of sorts for the way perspectives on environmental change writ large are reflected upon discrete events.

An additional change in the project focused on the treatment of sense of place and place identities. The initial interview prompts focused on sense of place and place identity were modeled after the Stedman's (2003) analysis of place satisfaction and attachment that focused in part on the sociality of places, as well as Anthony et al.'s (2009) description of the economic, inspirational, aesthetic, and tacit values that are often associated with coastal areas. These analyses focused not only on the levels of

satisfaction of different part of their environments, but also the nuance of meaning through which people build their complex associations with place. While this project still inquired about these associations, this overall analytical focus quickly became subsumed by the strong local associations with historically developed identities derived from resource extractive economies.

Accordingly, the project again shifted from a frame of reference in which economics and aesthetics were considered separately to one in which the historical and contemporary economics of making a living permeated conversations about nearly every other subject. Perhaps unsurprisingly, these resource extractive identities—this term was chosen rather than logging identity because of a long history of multiple types of resource extraction including fishing and shellfishing, as well as mining for coal, nickel, chromium, and other materials—and the economic systems that they support also influence, albeit in different ways, many of the observations about perceptions of future environmental change. Without diminishing the importance of aesthetics—particularly because interview responses evidenced that satisfaction in this context often arose out of the natural beauty of the area—the focus on identity shifted to a more unitary focus on the historical economic experiences of the area.

## CHAPTER V

### DATA ANALYSIS AND RESULTS

This cohort of residents of Coos Bay and its surrounding environment evidenced a relatively high level of environmental sensitivity and awareness. All were aware of the risk of climate change and the risk of an earthquake and tsunami as general concepts (meaning that they had heard of these potential risks), but employed four methods of

discursively understanding future risk. While these four likely do not represent a comprehensive inventory of all discursive approaches to risk employed by the community, each arose with surprising regularity and represented a dominant mode of discourse. The first, which I term environmental determinism, is somewhat at odds with the other three. Marked by internal inconsistency in how it translates to action, environmental determinism is a pessimistic and minority view that is principally associated with earthquake and tsunami risk. It appears to be based primarily in an understanding of warnings provided by scientists and public authorities without much, if any, changing of the narrative subject from a causative material reality and its effects on people.

Opposing this view and creating a discursive split are methods of symbolic discourse that tend to de-emphasize risk by situating them within their historical and environmental context, although in different ways. The first two, the symbols of isolation and self-reliance and the symbols of preparedness, are associated primarily with memories of future earthquake and tsunami risk and draw heavily upon participants' historically-grounded place and community identities. The symbols of isolation and self-reliance draw from a deeply felt portion of the local identity that derives from a sense of geographic and social isolation within the community. This sense of isolation is countermanded by a narrative of rugged self-sufficiency that is derived from the history of Euro-American settlement of the area and the boom and bust cycles of its economic history. It serves to shift the frame of discourse and therefore the way that the future CSZ earthquake is remembered from one of geophysical determinism to one situated experience and human resilience.

The symbols of preparedness involve a shift of the frame of discourse from environmental determinism to one of human involvement through various personal and community-based preparedness plans. These plans involve a modicum of personal choice and agency within the context of institutional entreaties to be prepared for catastrophic risk. Without expressly denying future risk, this vision of the future shifts the narrative content of conversation away from the potentially destructive effects of environmental events by emphasizing individual and community agency in preparation.

The fourth discursive category, analogy to the familiar, is more closely associated with the risk of climate change related flooding than the CSZ earthquake and tsunami. It develops as people envision future climate change flooding risks by analogy to the winter flooding that is relatively commonplace on this section of the coast. Study participants tended to think of flooding as a regular and normal part of their lives given recent and historical experience; in this frame it only represents a negligible cost that is secondary to other community concerns. This is easily distinguished from perspectives on flooding of the type that is expected to be incident to the CSZ tsunami.

Furthermore, analogy to the familiar manifests in another way within the context of the localized effects of climate change. Expected changes to the local weather have prompted a sense of economic optimism among some participants. This tendency, termed the Napa North analogy, is based in the hope that climate change will bring warmer and sunnier summers that would in turn foster increased tourism and the residential settlement of the wealthy. In light of the economic tribulations endured by this community in the wake of the decline of the timber and other industries, this reflects the widely expressed hope that tourism can serve as a contemporary way to marshal the area's striking natural

beauty for economic gain. Community residents used each method to understand and describe future environmental risks and from their widespread use it is evident that these form a portion of the way that the community conceptualizes these environmental risks. While they are each related in some ways, they tend to be used in different ways and draw from different sociomental and cultural repertoires.

Yet it would be a mistake to draw hard categorical distinctions between each group as they sometimes overlap and influence one another. This overlap and the resulting lack of perfect categorical clarity and distinction should be expected in any complex social context. Accordingly, the four categories are intended solely as analytical tools to understand approaches to how people remember the possibility of future risk on the coast. As will be outlined, each process exists on a continuum of public concern that roughly maps the continuum of social unsettlement provided by Lizardo and Strand (2010). In this way, it tends to extend the application of their ideas into the field of environmental change. To protect the identity and confidences of the study participants, in this paper each has been assigned a pseudonym and other details that might allow identification have been modified.

a. Environmental Determinism.

Although this is a minority viewpoint, it is useful to start off—like the early history of natural disaster studies—among people who are strongly influenced by their understanding of the material reality of risk. Before proceeding, however, a couple of caveats are in order. First, this analysis is cabined completely within the earthquake and disaster, as no participant related stories or conversations about potential climate change risk that evinced a sense of powerlessness towards its impact on local human

communities in the near future in the same forceful manner that was typical of descriptions of the CSZ event. The one account of climate change that might be viewed as determinist also emphasized the temporally remote nature of its effects on people. Consequently, no one considered making any significant life changes based on expectations of increased storms, flooding, or the other potentially adverse consequences of climate change. Quite the contrary, mixed with a slight sense of distant worry there was a countervailing sense of optimism about the local effects of climate change based primarily in the potential for it to attract tourism and wealthy climate refugees, if not about its more global repercussions.

Second, within the context of the CSZ event, there was no indication that those who did not express primarily deterministic feelings about the earthquake and tsunami were ignorant of their potential effects. In fact, a generally high level of knowledge about the potential effects of the CSZ event among survey participants belied the idea that the level of knowledge may be the root cause of greater or lesser levels of unsettlement. Environmental determinism in this context implies that environmental risk to people—either the participants as individuals or their communities—will be the determining factor in how future risk manifests. In some cases, however, there was a sense of resignation about the inevitability of the CSZ earthquake absent strong personal concern.

For example, Richard, a retired businessman, not only knew of the tsunami threat to the coast but also could pinpoint where on Route 101—a major thoroughfare—“the ground dropped 30 feet and caused huge tsunamis that were recorded in Japan and China back in the 1700s.” Yet immediately after he continued “but I don’t think that’s a fear thing, our biggest environmental risk” before concluding that forest fires and their effects



on the local economy through tourism were more important. Similarly Corrie, who had moved back to the area 18 months prior to the interview and expressed a sense of “coming home,” said about the earthquake risk: “I think it’s inevitable, it is what it is so, I feel, I can’t really feel good or bad about it, it’s just what it is.”

Amy, a professional in the tourism industry who had moved to the area 15 years before and served as a community booster, related that “the...thing that could be a huge change is when the [tectonic] plates go like that, and we get a tsunami like they’re telling us” before nervously laughing that “I don’t know how that’s going to turn out.” Yet moments later, while describing a training video she watched about similar earthquakes in Japan, said that “after about 10 minutes I’m like ‘I’m convinced, shut it off’...I mean I recognize it but you just have to put it aside.” Leslie, a seasonal state employee, small entrepreneur, and sailing enthusiast remarked: “well [the tsunami] is bound to happen, fault lines and whatnot. It’s just due. It’s due.” Yet when asked whether the anxiety that she described as having resulted from this danger influenced her decision to leave the area by means of a planned long-term sailing voyage, she responded with a simple “no, not really.”

These examples illustrate the common perspective of people who recognize the extreme risk presented to the community on a long timescale yet remain ambivalent when they discuss this risk. Many have engaged with the idea of an earthquake and tsunami professionally, exhibited an awareness of the origin story of its discovery and description by geologists, or are frank in their assessments of its potentially catastrophic results. Despite this body of knowledge and belief, however, they do not evince an associated deep sense of despair or resignation.

A second viewpoint links a belief in determinism with a countervailing argument that notwithstanding the recognition of the probable effects of the earthquake and tsunami, it is a risk worth taking. This is described by Matthew, a government employee who had lived in other parts of Oregon, moved to the area only a few years before, and has decided to make the area his long-term home. He spoke about his understanding of how the greater community understands the earthquake threat and the psychological effects of that knowledge:

And when the 9.7 [earthquake] recalibrates everything around here it will be, you know, start from scratch....And I think that, too...is part of the psyche is that anybody who's lived here for very long at all realizes that, you know, you deal with winter storms all the time, you get the full brunt 70 mile per hour winds, oh my god. And then you're also constantly being bombarded with tsunami warnings and tsunami escape routes and so a lot of people are pretty into that and they understand that an earthquake could do some serious hurt and so I think in the back of people's minds they know that this could change just like that, in a big way.

Yet this had no apparent effect on his desire to remain; he resolutely made clear that he had decided to retire in the area due in part to its natural beauty notwithstanding this knowledge. Jack, who grew up in the area and recently returned after some time spent working elsewhere expressed a similar sentiment: "I have a friend [in another coastal town]," he reported "[who is] concerned about the big earthquake when it happens and, you know, there's always that risk...but I think the risk of that, the chance of that happening will always be outweighed by the benefit of living here, and you'll always get people living here up until the earthquake happens."

Contrast this with the viewpoint of Melinda, who runs a small contracting firm that works on a number of sites throughout the county. Describing her work near a chromium mine in the hills on the outskirts of Coos Bay:

I've been on those sites [chromium mines]. And the whole idea that the chromium comes up the ocean and it gets stuck at the parts that stick out. And then when the tsunami comes it lifts it up and deposits it, and those sites are way up high and the whole idea [is] that the tsunami came and lifted it. *That's made me realize that oh, we're all dead. There's no safe spot.* It's all the way up in the hills there. We're all dead....Knowledge, knowledge is great. And horribly scary.

Melinda also relates an uncommon perspective on preparedness: its futility notwithstanding that she has endeavored to prepare herself and her family. While she does take precautions, these are based in developing independent skills that will allow her to survive the first few minutes. Still, she admits, "you know it's a catastrophic event that you keep thinking you can prepare for and you can't really prepare for it." Gary, a local businessman and outdoor enthusiast with a strong appreciation of the area's natural amenities, echoed these feelings: "there is a very real possibility that we could have a devastating earthquake here and we're not prepared at all." Melinda's mixed feelings about environmental risk and preparedness evidence that compartmentalizing the meanings that people express about such risks might be overly simplistic. It is possible to have a strong sense of environmental determinism and still engage with one or more of the other discursive practices that tend to draw future memory away from a deterministic viewpoint. This does not mean that the practice eradicates any sense of determinism. The key is which discursive practices are emphasized, and to what extent.

George, a retired scientist who reported feeling an overall sense of optimism about the town due to the presence of natural resources and the community's relationship with them described a similar sense of resignation. He stated that he "doesn't care" about uncertainty related to the earthquake and tsunami because of his focus on relative certainty: "You know there's going to be a big earthquake... Well, is that uncertain or

certain? It's uncertain when, but it's certain that it will. And...that's gonna hit the reset button on all these towns....I mean it's totally gonna, it's gonna be major." Later he continued by noting that he liked to worry about the natural world and that "[he] can be much more comfortable thinking that there will be a geologic future to this place. Whether it includes our species or not I don't really know." After noting that he had given up his "house to the tsunami gods because we're in the zone," he remarked that "you just need to be aware that that's what the natural world is, recognizing that there will be a devastating event...and the notion that there will be one of these large scale events in my lifetime is both frightening and compelling."

Bob, also a retired scientist, represents the extreme form of adherence of environmental determinism. Perhaps the best informed study participant about the risks of geophysical changes to the coast, he maintains his high level of knowledge through daily consumption of media and academic materials focused on coastal and climate science, and still find evident joy in his professional associations: he related his excitement about attending an upcoming professional conference and keeping up with former colleagues even after his retirement. He also feels a strong affinity to Coos Bay as a coastal area and appreciation for community-wide efforts promoting tsunami preparedness, yet decided to renovate and sell his house, then move east, because his new town would be outside of the earthquake and tsunami risk zone. When asked whether this was the primary reason for the planned move, he explained:

It is, it is. I look for statistics that will allow me to make some kind of sense out of the almost random nature of these events and the one that sticks so closely is the one that says that the intervals between these major tsunamis in the last 7,000 years, 75% of them have been shorter than the interval we're in now. That to me is a way to make sense of random events. Yeah, so I wouldn't mind getting out of here before it gets me and

my wife is even worse....Has these damn nightmares about tsunamis sucking us up.

These participants illustrate the continuum upon which the environmental determinist standpoint exists, even among people who are highly cognizant of potentially catastrophic material reality of an earthquake and tsunami. Though the primary narrative strain that is concerned with the event—that of its future occurrence and destructive effects—is relatively consistent, there are a number of discrete perspectives that result from this common future memory. For example, although Bob and Melinda had similar thoughts about the material reality, their reaction was strikingly different. Part of this may be explained by the personal background of each: Bob as a scientist who came to the area relatively late in his life, whereas Melinda is a lifelong resident. While she has found success in her professional career, Melinda also strongly expressed a shared identity with other longtime residents of Coos Bay who look “beat up” and experience loneliness and isolation due to the rugged nature of the coast. She described how these residents must rely on physical and mental strength to get through the day.

Despite resignation to a material reality, then, issues of identity and socialization appear to still influence approaches to catastrophic risk. Yet despite the interior complexity of those holding deterministic viewpoints, this is merely a starting place for the exploration of other modes of narrative complexity that influence how this community understands future risk. Bearing this in mind, we now turn to some more concrete ways that people socially construct disaster narratives in a manner that draws them away from environmentally deterministic perspectives, using constructed memories of the past to create memories of the future.

b. Symbolic Isolation and Self-Reliance.

“The difficult times of the present” in Coos Bay, writes historian William G. Robbins (2006, p. 10), “mirrored a historical tradition that involved struggle, sacrifice, and a willingness to ‘stick it out.’” On the “isolated southern Oregon coast,” early historical connections were primarily south to California due to the lack of overland routes linking the area to the rest of Oregon (Robbins, 2006, pp.10, 15-25). One late nineteenth century resident put it plainly: “We don’t know anything of Oregon except that our votes are returned and counted in Salem” (Robbins, 2006, p. 17). This legacy of isolation on the coast remains palpable today and was a common theme described by study participants both in the context of relationships between insiders and outsiders and in the context of the discursive differences between those with a longer personal history in the area and relative newcomers.

“When I look at the entire Oregon coast,” related one participant “we’re distinguished by some of our assets....And also our isolation. Actually, isolation is a good theme for the coast.” One long-time resident expressed the feeling of economic isolation of the Coos Bay area specifically through geography: “we seem to be unable to mount an effective economic development area because we are literally at the end of the road.” Being at the end of the road had other material consequences, as noted by Charles, a retired educator who remained active in the community through his work with a number of community development and service organizations: “[supermarket] shelves get empty in three days if highway 48 and 32 get closed off.” Others tended to agree that a psychological barrier brings about feelings of remoteness that interfered with economic potential. Matthew, the government worker who had moved to the area only a couple of

years before and had since resolved to remain, described this psychological remoteness as an “out of sight, out of mind thing” that has contributed to the prevention of the town from developing a tourism industry in line with other coastal towns that enjoy a perception—one not necessarily reflective of geography—of closer infrastructural connections with the inland regions.

Isolation was sometimes expressed as a product of history that incorporates both local geography and feelings of community in reference to the history of the area. Ron, a lifelong resident of retirement age, descendant of a family of historically notable locals, and a living repository of local history and lore, described how contemporary geography tends to isolate the area due to lack of direct connections to the interstate highway system. He also described how, until bridges were constructed in the 1930s, the only way to travel the coast overland involved ferrying across the numerous short rivers that run out of the mountain range that flanks the coast. These lengthy journeys often required a series of overnight stays waiting for ferries: “there’s all this culture, pre-bridge ferryboat villages.”

Remarking on her experience when she first arrived in the area for work, as a product of both local weather and isolation from family and friends, Valerie recalls that:

There’s a book...and it talks about some of the European settlers that came and there’s a family that came from Finland...and they’re now one of the homestead families...but there’s a part of the book where the wife did the same thing I did. She’s sitting on a tree stump in the pouring rain like ‘why did we have to come here,’ and I can relate to that.

Notwithstanding this inauspicious start, Valerie related how after originally moving to Coos Bay for employment, she came to appreciate the social and natural amenities of the area and is now highly satisfied with the decision to move there.

This sense of isolation also was expressed in direct response to questions about potential disaster. Valerie's thoughts represented the way that the area might be isolated in the event of a CSZ event because of its reliance on bridges for overland travel: "those are big deal things if [the earthquake and tsunami] happen, those will change the area and we're landlocked, I mean, if that happens our bridges are out, we're stuck. So we really need to think about that, prepare for it." Bob, the retired scientist introduced previously, who described the building of roads and bridges to connect the towns of Coos Bay to neighboring areas as one of the area's most important historical developments, said:

It would be good if we could get help from the state and people here feel quite isolated from the [Willamette Valley] and especially from Portland. I hear that a lot: that Portland politicians have no idea what goes on here, what the needs are down here and so on, and have no interest in doing anything about what needs to be done here. But in the final analysis I think it's the people here that need to [respond to disaster risk].

This is reflective of an additional theme. When asked who is responsible for addressing future coastal change, participants were nearly uniform in giving some variation of "all of us." Although it was phrased different ways and some participants also referenced various governmental bodies or gave caveats, on a foundational level the response indicated a desire for community-wide involvement that essentially devolved a significant portion of responsibility for response to individuals, and to the community as a whole. Part of this was possibly a functional response to expectations of rescue from the outside that were linked to this overall feeling of isolation. As Charles, the retired educator, describes:

Well, I think the uncertainty is the possibility of the, the big quake and that's, that's a little concerning because...we're so remote and by the time that we get onto the radar because of our population, that's...a concern...When people come to high ground [to avoid the tsunami], what do we do? You know, for a period of time [until help arrives]?



Laurie, who is professionally involved in disaster management and quickly noted the potentially “devastating” effects of the CSZ event in a manner that seemed rather deterministic, said that her “work allows me to realize that there’s gonna be help coming in...but it’s gonna be focused on the high population areas, and we’re not one of those.” This is reflective of a sense of contemporary isolation in terms of services needed to respond to other human crises. In the words of Celia, a non-profit manager who has lived in the area for her entire adult life: “we’re kind of isolated because we’re off the I-5 corridor so that we don’t get a lot of things that cities....We don’t have as much as other communities along the corridor because they get funding first and then it trickles down.”.

The joining of historical and contemporary feelings of isolation, however, does not necessarily imply an overarching feeling of helplessness. Historical isolation has bred, among a smaller subset of participants, a countervailing narrative of self-reliance. This is expressed both in the feelings of individual responsibility for maintenance of their own well-being and through the projection of survival strategies into the future based on historical experiences with isolation that have developed local character and tradition of this area. “People flock to the edge of the map,” Jack said, “and this is one of the edges of the map....Historically the west and Oregon have been a place that have attracted pioneers so I think there’s a contingency of people that are here in this environment for that reason.” His grandfather—who had been a bus driver before he decamped for Coos Bay in the 1940s seeking adventure as a fisher—had been one of those pioneers. Max, a fisher known in the community for his civic-mindedness and thoughtfulness, explained that “we’re only about 150 years old out here versus the east coast which is about 350 years old...and it seems like on the west coast we haven’t had engrained that culture so

deep for so long and we're a bit freer to think in different directions...so, it's like the wild west in a way."

This is reflective of the nearly unanimous opinion—notwithstanding that many participants described internal discord in the community along political and social lines about other issues—that local people and communities must take primary responsibility for addressing the complexities of future change. Even if it was not explicitly stated, a sense of this feeling sometimes arose in subtle references to economic or social optimism notwithstanding past economic shocks in narratives that link the town's modern experience to its resource extractive past. That is to say that, although the opinion that local people were responsible for their own future well-being was in some cases related to isolation, more generally it was based in a sincere belief in self-sufficiency. Living off the land is, in Coos Bay, a central narrative of life that is implicitly expressed in a multiplicity of contexts. These range from its historical experiences with resource extraction, to current debates regarding the wisdom of development strategies that emphasize industry or tourism, to the negotiation of community self-identity.

Yet in some cases it was stated explicitly in the context of natural hazards. Anna, a businesswoman from a prominent family who was one of the least concerned about future uncertainty in general, summarizing her viewpoint as "all Skittles and rainbows," described the legacy of what she termed her "pioneer "ancestry:

So, being a fifth generation Oregonian, it's knowing how to be sustainable and not have to rely if...the world comes to an end. I hate to [be] catastrophic but you need to be able to be self-sufficient and rely on what you know how to do. What you can catch, what you can hunt...So I think...that was ingrained in me, I was raised with that philosophy of...grow your own food.

The cultural and social endowments of the community, based in its resource extractive past, were also expressly described by some participants. Alison, a small business owner and local activist who first moved to the community 15 years previously, describes these endowments as part of her feeling of optimism for the future of the community:

Just a generation and a half ago this or, 2 generations ago, we were [the]... biggest sawmill export town in the world....And things have shut down over that time. But the skill sets that are required to cut down logs, live kind of hand to mouth, when the logging's good, it's good, when the fishing's good, it's good, when it's not, it's not. So we have a populace here that knows how to catch its own food, grow its own food, communicate with each other, share their resources, and those are very difficult jobs to have, so I think we have a very strong skill set.

Furthermore, in a later discussion about the CSZ earthquake risk, she describes her personal interest in helping to provide clean water and power in order to “lessen the stresses that make monsters out of people.”

The salience of the area's resource extractive past cannot be overstated. In response to a question about the most important historical event or events in the history of the area, there was near unanimity in reference to some analog of its history as a timber town. This was true for participants with familial roots in the area's distant past and relative newcomers. When participants expressed optimism about the future it was often, although not always, linked to their belief that the decline of timber and fishing could or would be overcome. When they expressed pessimism it was often, although again not always, linked in some way to the residual economic challenges presented by the decline of these industries. It was possible to observe, therefore, how through reference to the narratives of the past a responsive narrative or vision for the future has developed among a subset of the population. This narrative both recognizes the more

common theme of isolation and envisions past experience with that isolation as providing the necessary skills for survival.

This sense of isolation manifested in a number of additional ways that participants defined themselves and their communities. First, participants described outsiders as having more negative views of the area and newcomers as being more open to change than “old timers.” One participant who felt exceptionally strong ties to and appreciation for the local community and its small town character incredulously recalled that a Portlander she knew refused to visit, in his ugly words, “bum fuck Coos Bay.” Insiders also reported being generally more optimistic about their lives within the context of the area’s future than outsiders. Melinda, the lifelong resident profiled previously, and others described how newcomers are given a two-year social waiting period; those who make it past that point tend to stay due to an appreciation of the area’s positive attributes that subsumes the perceived negatives. Furthermore, newcomers were sometimes described as more willing to embrace change. Yet this dichotomy between insiders and outsiders does not imply that one group to the exclusion of the other expressed either isolation or self-reliance narratives: the individuals previously profiled in this section include lifelong residents and a number of people who moved to the area from elsewhere.

Second, the sense of isolation was based firmly in the local identity as a small town, and this small town feeling was described, in part, as the result of isolation. Numerous participants described some variant of a tradeoff occasioned by living in a small town. On the one hand, they found natural beauty, the lack of crowds, and the perceived safety of the small town environment as having attracted them to the area, motivated them to stay, or helped them to overcome the initial shock experienced upon

arrival. The appreciation for this “moderate” pace of life was palpable. On the other, the small town environment was thought to interfere with ease of access to amenities and services, as well as the development of economic opportunity to fill the void left by the decline in resource extractive industries.

The continuing sense of the social effects of this economic isolation manifests in other ways: beyond general unease with the present economy there was a concern that the lack of employment in the area was resulting in demographic changes because young people were being forced to leave to find jobs. The dislocation of young families based on economic necessity was a common theme. Yet isolation was also deeply related to the reasons that residents moved to the area or intended to stay; in particular it is interesting that small town character occasioned by isolation was described as creating a sense of safety. Thus isolation as a source of community safety countermands the observation that links isolation and danger in the natural hazards context.

Similarly, the importance of the natural beauty and amenities provided by this section of the coast and the consequent attraction for those who appreciate certain qualities of the outdoors cannot be overstated. Narratives that deeply touched central aspects of family and community reflect isolation in both a positive and negative sense. Isolation and self-reliance, therefore, did not arise out of the ether: each is deeply rooted in the local character and tradition of place, and intimately informs relative levels of satisfaction with the area. These cultural narratives, put simply, are emplaced in the basic character of the area.

Isolation itself and its salience in the community, therefore, seems generative of two related narratives that help develop collective memories of the future, both of which

are based in past experience. The first narrative is one of isolation in which human help will not be soon to arrive after a catastrophe. Although this is hardly generative of hope or optimism it does serve to reframe the CSZ event in localized human terms, altering the vision of future events. Another, shared by a subset of adherents of the first perspective, directs that the community will have to depend on its historically proven self-reliance to get by.

In a manner similar to the processes identified by Motloch et al. (2000) in creating local place character and traditions a few hundred miles down the coast, isolation and self-reliance reflect community character in the Coos Bay context, as mediated over time to create tradition. The perspective that arises out of this tradition and projects into the future tends to mitigate the unsettling effects of catastrophic environmental risk, particularly as it may be incident to the deep sense of isolation that is felt in the community. In each case this perspective has manifested in the context of the CSZ event first in a recognition of isolation based in local economic and social narratives of place and second in a default to culturally derived narratives that have served to create a sense of the future and what it will entail.

c. Symbolic Preparedness.

Although the narratives of isolation and self-reliance rest, generally, on preparedness skills developed in a turbulent past and relevant to withstanding adverse environmental change, a second category—symbolic preparedness—involves forms of preparedness that are more related to current institutional and personal efforts to ensure preparedness. Symbolic preparedness represents the dominant counter-narrative to an environmentally deterministic approach to the CSZ event because it occurred with the

greatest frequency among participants. In comparison, while narratives of self-reliance based in local history and tradition were common among participants they did not arise in a majority of cases even though the complementary, predicate narrative of place-based isolation did.

Like symbolic isolation and self-reliance, symbolic preparedness has been developed against a backdrop of recognition of the risk of catastrophic environmental change, and these responses focused primarily on the threat of earthquake and tsunami. These connect with organized efforts in the community to encourage preparedness—both in terms of tsunami drills in which a significant portion of the population walked to high grounds and professional efforts in relevant fields—and individualized efforts such as packing survival kits, stockpiling supplies, building capacity for home-based power and water generation, and devising individual evacuation and sheltering plans.

As described previously, this category is not conceptually distinct from the others: often narratives emphasizing preparedness were linked to environmental determinism, a sense of isolation, or both. The intent behind creating this categorical distinction is instead to emphasize the ways in which these narratives, like the symbols of isolation and self-reliance, modify the ways that people conceptualize their environmental future away from an environmentally deterministic viewpoint, albeit at times incompletely so.

Audrey, a medical professional who seemed tireless in her vocational and personal endeavors, had an intimate knowledge of community preparedness efforts. She recounted both choosing a house outside of the tsunami zone, the effects of a family member's military training on her personal preparedness, and working with her patients and others in the medical field to encourage individual preparedness and the development

of medical capacity. Yet she described these as efforts to be as “*semi*-be as prepared as possible.” As with a number of responses in this line, preparation is also linked to local isolation and a description of future events:

I think the one change you’re going to see as [a] clinician... is the 9.2 earthquake that we are pending, and tsunami. We run drills every month, we do radio checks on a monthly basis, so if it’s in three years, 30 years, six months, 600 years, we are prepared. We have multiple trainings; we are very, very, very active in preparing. But [we are] also training other people so if this happens after we’re long gone they’ll continue that trend. The tough thing about Coos Bay is that we are extremely isolated...our airstrip will be under water and the only two air accessible strips where you can get an airplane will be surrounded by water. They won’t be able to access but just small areas so we’ve worked on creating small pods in individual areas where a bunch of the surgeons are.

Amy, the tourism professional introduced earlier, linked acts symbolizing preparedness to a greater sense of security in the area, while at the same time describing a personal example of lack of preparation:

I’m not driving around with my survival kit, I know friends who are. It’s just difficult to comprehend...for people that really panic about it, the idea that I was told is that “if you put that [emergency] kit together you feel you’ve got that much more control to kind of fight back your demons or whatever.” I just have to...look the other way and hope that it doesn’t happen to me, or that I’m at home when it does.

Tim, who runs a transportation business and is active in community affairs, seconds the general concern about the risk of earthquake and tsunami, and the power of symbols of preparedness to alleviate conversational concern. In response to a question asking whether he was concerned about coastal flooding generally, he responded:

No, and one of the things I’ve thought about and I guess this might be a...physical environment concern, is that they keep talking...about what we’re going to do for this subduction quake....I keep talking to my wife, at least once of month it’s a topic of conversation, hey we have to put a survival kit together,...so we’ve been saying that for like four years, and one of these days I will do it, probably hopefully before the quake... But,



it's not a concern. You know, it's not something I lay awake about or anything.

Charles, who expressed fear of being left alone until help arrives, described having a backyard garden partially in response to the chance of earthquake risk, as well as the development of response teams to address local issues. As mentioned earlier, Alison felt that preparedness should involve ensuring alternative sources of energy and water in the event that infrastructure was destroyed. Bob, who evidenced in his planned move away from the area the strongest personal reaction to the threat, viewed the widespread community tsunami drills, one of which he estimated had 10,000 participants, as evidence that people are “taking the threat seriously.” The preparedness practices that other participants reported ranging from keeping a sailboat in their backyard as a makeshift tsunami refuge, to developing personal water and power backup systems, to strict adherence to earthquake codes, to education in schools and within the wider community.

This is not to imply that everyone shares a sense of security in the sufficiency of local preparedness. As Gary, the local business owner and outdoor enthusiast whose lack of faith in the level of preparedness was described above, recounted:

I remember, I think it was a sheriff who did an interview, and he said...the last time they had a tsunami warning, everyone drove to the beach. It was like... they wanted to see what it looked like, yeah stupid stupid stupid. He said next time instead of putting up a tsunami warning we're gonna say there's a bar fight in Coos Bay downtown, get 'em off of the beach.

The foregoing accounts should not, however, be taken to minimize the preparation process nor the efforts of those who participate. It is not intended to critique the urge to prepare nor the potential efficacy of preparedness projects. Yet in this community the image of assembling an emergency kit might obscure the heart wrenching

reality that surrounds preparedness. These hard and regular realities that are faced in the process of preparedness planning were poignantly emphasized by Celia, the non-profit manager who is also a mother of five:

I know that people have been, and school have been looking at safety preparedness, and so that's been a huge change. Because when I was growing up here none of this stuff was talked about. And now we're supplying like, little snack packs, we write letters to our kids, and put pictures of the family in these little Zip-Loc bags and they store them with a bottle of water so in case a tsunami knocks, because we're connected by bridges here and that's the first thing that's gonna go, is the bridges, which I think is really sad, like if you never see your mommy and daddy again here's a letter of how much we love you and a picture. Yeah, it's a little creepy.

In many of these accounts there is a sort of dissonance that manifests either through the admission of highly active semi-preparedness or through expressions of conscious concern coupled with a lack of action due to being overwhelmed or not caring too deeply. What is significant in these expressions of preparedness for the purpose of this analysis is not whether these efforts to be prepared are sufficient in light of the impending threat, but their symbolic value. This symbolic value tended to mitigate the discursive potency of the threat of the CSZ earthquake, reframing the conversation from what the effects will be—the material reality—to what people are doing.

In many cases sufficiency seemed to be symbolically implied, whereas in others it was symbolically or directly questioned or denied. It is important to recognize that official entreaties to prepare are ubiquitous in the area. Beyond the described evacuation drills, school programs, and reminders to assemble an emergency kit, the coast is littered with blue and white signs specifying the location of the nearest tsunami evacuation route. Even for a newcomer such as myself the geologic future of the area was palpable. Within days of first arriving in the area—and before I knew that the earthquake and tsunami

threat would be a focus of this study—I found that even without any active consideration I was aware of the importance of the steep hill that rose up directly behind the close-to-sea-level building in which I was staying. Subtly the question was reframed from “what will happen?” to “what will *I do* when it happens?”

In essence, stories about preparedness in this group of participants tended to dominate the memory of the future as it related to the CSZ event, inserting personal and community agency into accounts of an expected event over which people have no geophysical agency. This was the case regardless of whether the specific opinion expressed was optimistic or pessimistic, hopeful or resigned, or whether it expressed a belief in the adequacy or inadequacy of response. This is not to imply that efforts focusing on preparedness should be discontinued or called into question as a general matter. Indeed, the opposite is likely true. Instead, it acknowledges that the narrative effect of preparedness by multiple means can result in unanticipated effects on the basic discursive potency of knowledge within a community. As will be discussed, this discursive potency may influence social unsettlement, which in turn may influence action.

d. Analogy to the Familiar.

In the climate change context, respondents tended to use a process that I term analogy to the familiar to converse about the potential effects of climate change. This manifested primarily in two distinct ways: analogy to recurrent coastal flooding; and analogy to existing frames of reference used to understand economic concerns. Each of these created an effect similar to what Norgaard (2009, quoting in part Cohen (2001)), describes in the context of climate change as a form of implicatory denial: “what is

minimized is not information, but ‘the psychological, political or moral implications that conventionally follow’....[It is] not...a rejection of information per se, but the failure to integrate this knowledge into everyday life or transform it into social action.” In this way denial of climate change does not have to be literal: a person can accept that climate change is real yet deny it by implication based on their actions.

Only a very small minority of survey participants called into question the existence of climate change or that it may have potential effects on coastal areas; these few instances were generally in the form of admitting ignorance of the issue. There were a few secondhand accounts of climate denial: one participant related her husband’s resistance to the idea due to his conservative political stance; another described encountering denialists at local meetings; and a third described the community’s climate change views as something of a microcosm of the “national debate, there’s deniers, there’s I don’t give a shits, there’s the we gotta do somethings, save the whales, no eat the whales, that kind of thing.” While there may have been others who harbored doubts about climate change, these doubts were not expressed within the interview process.

While this study was originally concerned with the flooding effects of climate change, only the second means of relating to climate change directly implicated flooding. The first way—which is termed the Napa North analogy—came as quite a surprise. It involved the tendency of study participants to view climate change in a positive light due to the expectation that it will bring warmer weather and replace summer fog with sunshine. The term Napa North was borrowed from Audrey, who stated that the “Napa Valley [is a] wonderful place to grow wine [and] has been for years. Well now you look

at the [nearby] Rogue Valley. It is much hotter than it used to be; it's affectionately known as Napa North."

Similarly, Matthew explained, only half jokingly, that climate change might turn the area into the new San Diego, quite a contrast to the normally wet and chilly Oregon coast. Gerry, who cited the stark beauty and proximity to the beach as what brought him to the community and kept him there, was a little more moderate in his treatment of California weather, remarking that "more people will move here because it's going to be so unbearably hot south that they're going to start moving north and realizing that...these are the original San Francisco Bay Area conditions that we moved to." After noting a concern with sea level rise, Max echoed this thought process, with reservations: "as our climate changes...the Oregon grapes are a good year because it's a drier year, better grapes and all that stuff, that's good for some people but other people need more water, you know farmers...."

This might have been a temporary result of the conditions at the time interviews took place; over the course of parts of six weeks in the area from June to August I only saw significant fog twice. Everyone agreed that fog should be an ever-present feature of the summer in Coos Bay and that that summer was highly abnormal. However, given the economic priorities that suffused every interview and close to every topic about the area, it is more likely that these are reasoned opinions that translate current understanding of one aspect of the anticipated local effects of climate change—hotter, drier, summers—into an economic wellspring. Charles, who is involved with efforts to create cultural experiences in Coos Bay for the purpose of developing both tourism and overall quality

of life, reflected that because of climate change “I think that more people are going to move here.”

Melinda also saw a positive in the effects of global warming: “my opinion of this area has changed in the past four or five years...I didn’t hate it, but it was not where I wanted to live, and in the last four or five years be it global warming or whatever the weather has improved and my attitude has improved.” Later she related her views on community discourse about global warming, as well as its expected effects on rainfall in Oregon as opposed to elsewhere, with a laugh:

Because the weather is improving it makes me excited. I know the ocean’s supposed to rise...and it’s going to be horrible and everything like that but because we’re on the coast we keep thinking that we’re in this little safe bubble and so I’ve kind of carried that “it’s going to be great” because everyone wants to move here because we have water.

The Napa North example found another expression in a past case of potentially adverse environmental issue that brought economic advantage. In the words of Richard:

You know if the economy is stronger, you, you have more people spending money, the businesses doing well, and...we had back in ‘98 a chip ship [a bulk freight carrier that exports wood chips from the Port of Coos Bay] go on the beach...called the New Carissa....So for three or four months the help arrived in droves, the hotels were full the restaurants were busy, the stores because...they wanted to get the boat off the beach. There are some people that would say “gosh we lost another tourist attraction [when the ship was removed],” but other people that would go “oh but it’s polluting.” I’m not sure that that the truth isn’t somewhere in the middle. And...there was a micro-boom in the economy.

Jack made a similar connection between potential environmental degradation and benefit using the frame of the New Carissa incident. He labeled it a “defining incident” in the area that emphasized the “trade-offs between the use of natural resources in our environment around us...and some of the risks involved with those.”

It seems that the Napa North analogy, however, was lodged firmly in the summer. This analogy focused on the last few years of moderate weather and experiences—or at least perceptions—of the positive effects of weather elsewhere on local moods and economies. Flooding is generally a winter occurrence in this area, and the study participants treated winter flooding as ordinary and familiar. Despite the potential for winter flooding to increase in severity and magnitude due to climate change, these winter floods were analogized to recurrent known flooding in a manner that affected the narratives that they tell about the flooding expected from climate change. When asked about climate change related flooding Richard responded, “well, you have to understand that we're sitting on fill now, ok...the natural shore is 10 blocks that way” as he pointed inland from the café where we were meeting (which was itself two blocks from the present shoreline). He continued, “I think that cities like New York and, are going to be at more risk. Do I think that, in the foreseeable future is it [sea level] going to rise enough to flood Coos Bay? Well hell, Coos Bay floods now if you give it a chance.” Having been professionally involved in a number of real estate transactions prior to retirement, he stated “the joke is here ‘don't buy any piece of land unless you look at it in February and March to see exactly how much water there is.’ And...do I lie awake at night worrying about it? No.”

He was not alone in this assessment, not by a long shot. Amy related a story prefaced by “I know about flooding” that discussed the redesign of a car dealership and another local business to raise their foundations and avoid flooding, along with other local landscape design elements meant to avoid regular flood damage. Bob, who has been both professionally and personally involved in learning about the effects of climate

change, related the way that dunes near his house have eroded due to coastal storms, thus leading to increased risk of regular flooding for some of his neighbors. Tim echoed the general sentiment: “If [flooding] happens it happens and you pick it up and leave it, I mean that's just the way it is.” Anna adopted a similarly dismissive tone: she stated that she didn’t think flooding would affect the area and agreed that it is a normal winter occurrence.

Alison, who sometimes works in building engineering, when asked about whether she thinks of flooding, pointed to a building she took part in designing and said “Oh yeah, I live in a floodplain....The whole construction and build out of this building was defined by the floodplain and the regulations that surround that, so I think about it regularly.”

When asked about whether she felt that toxins might infiltrate the estuary due to increased climate change-related flooding, she responded “more so I think about the storm water, I mean, the hey it doesn’t have to be a flood event around here. We just have a very high water table.” Matthew spoke to the experiences of other people who live in areas accessible only by roads that are subject to regular flooding:

When you try to drive from point A to point B around here, oop, you can't go over this bridge because it's underwater. You know, so that's a natural, a natural and reoccurring phenomenon around here....I think the approach is everybody...this weekend actually I just stocked up on, you know, an emergency pack, and people have those, especially...up the Millicoma [River], places where they gotta go over bridges or low spots, they know that they're going to be socked in for a couple or three or four days, or maybe a week.

Together these analogies—the analogy to familiar coastal flooding and to a lesser extent Napa North—dominated the discourse about climate change. Unlike in the case of the CSZ earthquake and tsunami, memories of future climate change have concrete roots in lived and perceived experience. Recent changes in weather patterns and comparisons



to the relatively economically healthy tourist and retiree destinations, not to mention agricultural areas, to the south influenced Napa North. This was linked to salience in the area of economic benefit by whatever means (in this case tourism), as well as the social change that may be promised by an influx of retirees or other affluent migrants. The ubiquity of regular winter flooding, and each person's intimate experience with it, informs their approach, in this case evidently attenuating their sense of risk by characterizing it by reference to known quantities or modes of thought. In this way, in this context the risk of climate change related flooding is conceptually very different from that of CSZ earthquake risk, both because there are personal and community-wide precedents to work from.

Four narrative themes that outline how members of this community describe and understand environmental risk have been presented in this section. The significance of these observations, however, does not revolve solely around the narratives themselves. Instead, it also involves the ways that these narratives link to ideas about how changes in ideology and action come to pass after knowledge of novel and potentially unsettling conditions or circumstances percolates through a community. These narratives dovetail with the theoretical approach to revision of strategies of action based in the use of cultural tools developed by Lizardo and Strand (2010). Importantly, these do not only address the use of cultural tools to develop new strategies of action in *response* to unsettlement, but consider environmental risk as *generative* of the unsettlement necessary to break free of the constraints of the commonsensical or normal and to explore alternatives.

In Section VI the idea of future memory and its bases in mnemonics and shared narratives will be revisited. In turn, the correspondence between these narratives and the various stages of theoretical unsettlement described by Lizardo and Strand (2010) will be illustrated. For example, analogy to the familiar corresponds to a state of very limited or non-existent unsettlement that links to commonsensical approaches based in current experience, whereas symbolic preparedness, symbols of isolation and self-reliance, and environmental determinism correspond with increasing unsettlement and different trends in the deployment of cultural tools that might influence unsettlement. In this way the foregoing observations about future memory will be conceptually synthesized with their potential influence on ideological or strategic revision within this community.

## CHAPTER VI

### DISCUSSION

This small sampling of members of the community of Coos Bay, Oregon, outlined a number of perspectives on environmental risks that people use to create and reinforce the way that they remember events that have not yet occurred. How people socially construct their narratives of the future as part of communities—whether defined by geography, interest, or otherwise—influences the way that they discursively interact with their memory of future environmental change and in turn how they sense environmental risk. Environmental change, however, was far from the most immediately salient concern that participants held in relation to the future of the area. Instead, they focused on more immediate concerns regarding the local economy, the potential for industrialization, and demographic shifts. When the line of questioning was focused on environmental matters,

however, they began to emphasize the CSZ earthquake and tsunami, and in most cases climate change only arose as a topic of discussion through direct inquiry.

a. Socially Produced Future Memory and the Understanding of Risk.

In these interviews, it was apparent that conversations about the risk of potentially adverse future environmental change were socially produced and existed as social mnemonics, if for no reason other than the observation that similar stories emerged across this sample of the community. Patterns in the sociomental understanding of future environmental risk emerged that tended, in different ways, to use mnemonic structures to ignore or emphasize a particular vision of the social and personal negatives that might result from future environmental risk. Given that both what we choose to ignore and what we choose to emphasize are powerful (Zerubavel, 1996, 2007) the mental visuals—the socially produced memory of the future—that translate into these narratives allow us to trace some means by which people come to understand future environmental risk.

The narratives associated with symbolic isolation and self-reliance, symbolic preparedness, and the use of analogies to the familiar each drew the emphasis away from a vision of the material reality of events that is probable, or at least believed to be probable. Within the interviews, these narratives represented more than just something people said or a half-perspective that they believed to be true, but instead they represented a powerful vision of the future. This vision seemed to be not so much the product of unsettlement (or at least not only the product of unsettlement) but generative of feelings of settlement or unsettlement in the first place.

It would be disingenuous to argue, however, that these narratives operated as some sort of cure or panacea for the fears or anxiety that is attendant to future risk.

Instead, they are more properly analogized to a salve. Zerubavel (2007) suggested that metanarratives that ignore or contradict an observable reality also have the capacity to unsettle. Along with the incomplete nature of the salve, this helps to harmonize the observation that people who related narratives of the CSZ earthquake and tsunami at times also related a sense of anxiety that suffused their descriptions. As Zerubavel may have predicted, the processes attendant to the creation of collective memories and the processes by which information was selectively emphasized or deemphasized appeared to be the product of collective orchestration. Yet this orchestration was bounded by historical and contemporary narratives of a resource extractive past, the boom and bust cycles of this past and current perspectives on industrialization, a present in which tourism and in-migration are generative of hope in economic recovery based in the natural aspects of place, an appreciation for aesthetic attributes of the community, and the social aspects derived from its isolated small town nature, and others.

Memories of the future, therefore, should be viewed both as the product of place and community identities grounded in narratives of collective history, and generative of a lucid vision of the future that may tend to further bind the identity of the community. Moving backwards through the discursive practices previously described, analogy to the familiar tends to implicate recent personal experience and concerns, symbolic preparedness tends to reflect explicitly stated community-wide imperatives, and symbolic isolation and self-reliance tends to emphasize deeper narratives of local place-based and community identity. Critically, each of these narratives evidenced the projection of present and historical thought processes into the future. It is intriguing to consider that to the dyad of historically-determined place tradition that bridges that past and the present,

and place character that exists in the present, each as described by Motloch et al. (2000), a third phase of place identity may be added: that of place-based future memory and expectation that is traceable through the stories people tell about the future.

While these stories incorporate a variety of representations of the material reality of the area, they present a lens through which it is possible to understand how future disaster is remembered without over-reliance on a single event-based vision of material reality. Furthermore, this expands the scope of social construction within the natural hazards context further afield from the command post, embracing a bottom up approach while at the same time not divorcing the community from its institutional and social history. Perhaps most importantly, it emphasizes a social approach to natural disaster that is not merely reactive: a vast majority of the analysis of natural disaster outside of the climate change context is focused on the post-disaster phase and not the precedents to disaster viewed from the *ex ante* standpoint.

b. Socially Produced Narratives and the Production of Unsettlement.

Having established the existence of these intersubjective environmental narratives that are present if not overwhelmingly salient, it is possible to explore the interaction between these narratives, their generation of social unsettlement, and eventually (although not in this study) the potential for the generative effects of this pattern to influence behavior. Originally, the aim of this study was to explore how familiar and unfamiliar environmental risk might (relatively linearly) amplify or attenuate the sense of unsettlement that Ann Swidler (1986) described as prompting revisions to strategies of action for life. Yet the emergence of the narrative structure of future memory over the course of participant interviews began to suggest that relative levels of unsettlement may

be intricately and possibly non-linearly linked to the ways that community members remember—meaning, how they concretely visualize—the story of their future in light of catastrophic environmental change.

The first stage in understanding this structure involves ontological security. Challenges to ontological security and the sense of stability in the world that it describes provide a vehicle of unsettlement. Clearly, emergent knowledge of future catastrophic risk has the capacity to unsettle this sense of stability. Knowledge of the probable material reality of risks, however, did not seem to be determining factor in how this community socially produced their vision of the future (or their preferred response). Instead, each of the four narratives evidenced different strains that tended to maintain or challenge a sense of stability. As a preliminary matter, the environmentally deterministic view and its immanent disruption of the stable and meaningful world bears the most striking signs of unsettlement. Yet accounts of isolation and the resultant self-reliance also strongly evidenced unsettlement, albeit in a form that was discursively modified by history and tradition to lend a patina of future stability. Preparedness, too, was linked to unsettling visions but in most cases this story tended to produce greater settlement than the preceding two categories, in large part because the narrative focus was less on the destructive effects of expected events and more on a relatively empowering vision of present personal agency. Finally, the way that participants used analogies to the familiar in the context of climate change were clearly the least unsettling narrative focus, emphasizing only slight and distant concerns and countermanding these concerns, in some cases, with a sense of optimism.

Emerging from the recognition of the non-deterministic nature of knowledge (or understanding), this analysis allowed for a method of development of our understanding of how to conceptualize the basis for unsettlement embedded in each of these narratives of catastrophe. When these four themes are compared to the states of social unsettlement provided by Lizardo and Strand (2010), parallels begin to emerge. Remember that they direct that social unsettlement—and its effects on ideological and behavioral change—can exist on a continuum that is derived from, first, whether explicit institutional prescription exists to address a change in circumstances and, second, where such prescription does not exist, whether the unsettling circumstance is recognized. Strong institutional prescription leads to an adherence to tradition and a common-sense view of the world, while relatively weaker prescription featuring gaps or cracks develops into social action first through regulated improvisation, before additional recognition of the unsettling circumstances trigger greater and more cognitively costly ideological shifts (Lizardo & Strand, 2010).

There is a critical distinction here between older conceptions of toolkit theory that strikes to the heart of the concept of unsettlement. There is no requirement, per Lizardo and Strand (2010), that unsettlement be based in actual recognition of the breakdown of cultural scaffolding. Instead, there may be a period prior to recognition of this breakdown in which cognitive effects may be observed, but before the commencement of the hard work of ideological shift. They analogize the period that “predate[s] periods of reflexive recognition of unsettledness” to the “situation in...cartoons in which the animal walks off the cliff but keeps ‘hanging in the air’ and does not start to fall until it looks down” (Lizardo & Strand, 2010, p. 220).

c. Correspondence Between Observed Narratives and Stages of Unsettlement.

Within its division between instances in which institutional prescription exists, and its division between recognition and non-recognition of the breakdown of cultural scaffolding, is a system that bears marked similarities to the four ways of thinking about future environmental change that were observed and their interaction with the maintenance of ontological security. Although these similarities are imperfect because the use of a continuum tends to presume a categorical separation between each narrative, which was not observed, the use of Lizardo & Strand's (2010) continuum proves to be analytically useful because the use of an analogy to their theoretical approach weds developments in cultural and cognitive sociology with inquiries into environmental change.

Nor does variation within perspectives in this community or overlap between the themes were each observed prove to be fatal to the utility of this continuum as analytical tool. Lizardo and Strand (2010, p. 223) observe that "not all actors will be equally able to adapt to newer externalized cultural scaffoldings to the same degree" because "all periods of dissolution of external support for action and the reconstitution of new ones separates actors into *institutional generations*" in at least the context of practical (i.e. automatic) consciousness, due to different levels of habituation to the preceding form. In the case of place, it seems that the distinction between the institutionally "old" and the institutionally "young" (Lizardo and Strand, 2010, p. 223) implicates not only age, but perhaps also length of time in residence in a place as well as qualitative aspects of residence, perspectives on local history, and interaction with the environment. Their use of a continuum, therefore, may illustrate categorical differences but should not reify the same



by implying that each is wholly distinct from the others. People are complex and their reactions to environmental change proved to be similarly complex.

Here, a final word of caution about the use of the continuum is appropriate. It may be more useful to envision their continuum not as a line but as a circle with each of the four discursive camps on a separate pole. Starting with this representation, when emphasis is placed on one pole it will deform the circle by creating a bulge. Similarly, when a pole is de-emphasized or ignored it may be represented by a depression. The bulge or depression would tend to stretch the circle away from the other poles, but usually incompletely. Envisioning these relationships in this way would emphasize that these categories can co-exist and that their influence is relative not absolute. In this way it is possible to graphically represent the relationships between narratives absent the implication that one destroys the others, and preserving the ability to add additional narratives to the circle.

Beginning with periods of grossest unsettlement, Lizardo and Strand (2010) describe a two-phase period after which existing cultural scaffolding has broken down. The early phase precedes reflexive recognition of this breakdown while the late phase incorporates such reflexive recognition, leading to the conclusion that existing approaches may no longer be appropriate or sufficient. They equate this later period to the “high ideology” periods described by Swidler (1986), which “seemingly ‘meaningless’ patterns (in contexts featuring stable scaffolding) of belief and practice come to be charged with crucial meaning resulting in group polarization and bouts of ideological organization at the ‘cultural system level’ keyed around a predictively small

(e.g. cognitively manageable) set of ‘take off’ issues or cultural practices” (Lizardo & Strand, 2010, p. 222).

These “late periods” after “reflexive recognition that [externalized cultural] scaffolding have...broken down...[may] set off the conscious search for new models” (Lizardo & Strand 2010, p. 220). Within toolkit theory, this is the stage around which reorganized strategies of action are formed, but these are “cognitively costly...[meaning] that the development of new ideological systems are expected to require specially demanding *representational and mnemonic resources* beyond those usually considered” (Lizardo & Strand 2010, p. 222, emphasis added).

For Bob, the only member of the sample who had resolved to move away due to environmental risk, the description of the cognitive cost to he and his wife is relatively clear. Perhaps because he is so well informed—remember that he is a retired geophysical scientist who takes pride in his ability to remain abreast of new developments in his field—they found themselves at the highly unsettled end of the spectrum and decided to revise their strategy of action for life. Yet most people do not subscribe to this strategy, and this also makes sense. Cognitive cost also applies to those who recognize the danger presented yet for whatever reason plan on staying. Lizardo and Strand (2010, p. 222) posit that “the motivation to develop, search for, or adopt new explicit ideologies to organize action can only come after a period in which old, practical strategies of action are applied in the context of dissolving objectified support for them and the person records a series of violations of expectations for the future.” This expectation is complicated in the context of the CSZ earthquake and tsunami because there is no direct local precedent within the social memory of this participant cohort. While some

participants related that the Indian Ocean earthquake and tsunami in 2004 and the Fukushima earthquake and tsunami in 2011 focused their attention on the local possibilities, these analogous events remained distant.

i. Environmental Determinism and Chronic Unsettlement.

Notwithstanding the absence of this local precedent, based on the memory of the expected future and constant reminders of this future that challenge practical expectations (be they in the form of tsunami warning signs, discourse, or personal experience) some people will not yet be motivated to adopt new strategies of action but will be “subject to a chronic state of ‘unsettledness’ [and] will evince a demand for explicit cultural systems...to guide their action” (Lizardo & Strand 2010, p. 222). This chronic state of unsettledness absent revised strategies of action reflects a stage on the continuum in which, overall, people are unsettled yet perhaps they have not become sufficiently so, or at the present time experienced sufficiently contradictory circumstances, to precipitate the change to strategies of action notwithstanding palpable anxiety that in some cases resembles despair or resignation.

This is typified by Melinda, whose anxiety manifested in the proclamation that “we’re all dead” based on her observations of the altitude that was affected by past tsunamis, yet who also seemed resigned to living with the risk. She and others who similarly visualize the future cannot be compartmentalized into a unitary manifestation of “unsettled” that automatically drives action. There is no flip of a switch and declaration of unsettlement, but fluid boundaries between the discursive categories as they map the process by which settlement becomes unsettlement. Thus environmental determinism exists in different forms that may be reflective of placement on the continuum within the

post-recognition category. Some participants also made statements that suggested that this last phase of unsettlement might be subject to emotional mediation in a manner similar to what was observed by Norgaard (2011) in the climate change context. The multiplicity of causes would also serve to explain some of the internal diversity of thought in this group.

ii. Isolation, Self-Reliance, Recognition, and Socio-Historical Identity.

While environmental determinism represents the apex of unsettlement, albeit one represented by both an active and more passive type of response, isolation and self-reliance represent a symbolic blurring of the determinist vision of the future, replacing a portion of the material reality of the geophysical world with a vision of identity-based human action. How this operates in practice seems analogous to what Lizardo and Strand's (2010, p. 220) period of "early unsettlement," before the reflexive recognition of the breakdown of applicable cultural scaffoldings: these are "periods in which actors still attempt to implement old, habitual strategies of action in objective contexts that no longer facilitate them." Local tradition and identity formed the basis for much of the discourse that surrounded isolation and self-reliance, with isolation encompassing both visions of the distant past, more recent feelings of physical and social isolation, the exigencies of geography, and self-reliance emerging from narratives of common social history.

Isolation as a concept joins with viscerally felt associations with community such as a small town character and the natural endowments that provided the primary motivation for many to live in the area; that it was so prevalent in future visions of disaster follows the logic of early stage unsettlement. As stated by Lizardo and Strand (2010, p. 220, emphasis added), within this pre-reflexive recognition world:

[A]t the level of discursive consciousness persons are expected to mobilize a seemingly endless labile armamentarium of justifications and framing strategies that serve to manage their perceptions and ultimately delay *recognition* that a particular taken for granted external structure for organizing action can no longer be relied on.

Since recognition is the factor that drives cognitive movement from relative settlement to unsettlement, the cultural and social symbols that are employed in this context may therefore influence whether and to what extent unsettlement is felt in light of changing circumstances. In this way, the multiplicity of relationships between future environmental change and social motivation begin to come into sharper relief. It became apparent within the interview process that the relationship between environmental determinism and isolation and self-reliance exists less as discrete point on a continuum and more as a complex. While each conceptually elaborates on unsettlement, there was no observed one-to-one relationship between a particular viewpoint and unsettlement. The representational and mnemonic forms provided by deep cultural associations did seem to acquire additional meaning within the context of greater unsettlement: instead of isolation being conceived as a function of ease of shopping or attraction of tourists (as sometimes came up early in interviews before environmental change was broached), it becomes a frame for geophysical and social fractures within the community, as well as fractures between the community and outside based in trust and safety.

Within the practical consciousness, this period is marked by “*hysteresis*” or a “false anticipation of the future” (Lizardo & Strand, 2010, p. 221). While within an interview process it is difficult to trace the operations of the practical consciousness because the process itself is founded in discourse, Lizardo and Strand’s (2010) “key theoretical implication” arising from the operations of the practical consciousness in the

early reflexive period is critical. It suggests that “repeated experience with external cultural scaffoldings for creating and managing lines of action... ‘train’ practical consciousness to expect them to be consistently available, even when they are no longer around to support action” (Lizardo and Strand 2010, p. 221).

Accordingly, rather than merely influencing the way that people think about future environmental change, discursive memories of the future might tend, through the use of inference and assumptions regarding possibilities, to direct choices regarding response. Observing the internal structure of this complex of discursive factors that influence unsettlement, it is intriguing to consider that symbolic isolation lies on or close to the border of the late stage of reflexive recognition that is linked to the greatest level of unsettlement, while symbolic self-reliance tends to locate the discourse more fully into the early stage marked by false anticipation of the future and a tendency to develop internal risk probabilities based on past experience (per Lizardo & Strand, 2010, p. 221). Therefore the way that future risk is not only thought about, but felt, may be influenced by these factors.

iii. Symbolic Preparedness: Fractured Institutional Prescription.

Symbolic preparedness appears to represent a phase that lies closer towards settlement on the spectrum suggested by Lizardo and Strand (2010). Preceding the full breakdown of cultural scaffolding—perhaps in the context of perception of a future event this is better described as preceding explicit breakdown of a sense of stability and meaning based on expectation—that has been analogized in this paper to environmental determinism and symbolic isolation and self-reliance there is a period in which people begin to perceive gaps at the intersection of institutional domains. Within these contexts,

which exist “between the crevices” of direction provided by institutional domains, cultural elaboration operates in an inverse relation to the levels in which institutions “constrict discretion” (Lizardo & Strand, 2010, p. 218).

Therefore this form of unsettlement exists as a balance between institutional direction and a feeling that people have been “left to their own devices” (Lizardo & Strand, 2010, p. 218). In the context of the expected CSZ event, the clearest institutional direction exists in the form of entreaties to be prepared and aids to preparedness. This is embodied on the landscape and within the relations of the community on an interpersonal and official level. There may be insufficient cultural scaffolding to fully address knowledge of future prediction and there is a palpable sense that in some ways preparation is personal and each individual is left to his or her own devices. On the other hand there is significant institutional direction in favor of preparedness as a concept and in favor of particular modes of preparation, as well as communication of these modes.

At this stage, at the level of practical consciousness “regulated improvisation” takes the fore; this is an expression of “‘deep’ embodied dispositions, produced through consistent, protracted experiences in externally structured environments” that is neither fully improvised nor fully regulated (Lizardo & Strand 2010, p. 218). Preparation appeared to be individualized and involved a great deal of personal choice, notwithstanding the countervailing penumbra of institutional prescription. In these “institutionally ill-defined crevices...embodied dispositions...will be most prevalent and the implicit culture stored as embodied dispositions will be most likely to shape choices” (Lizardo & Strand 2010, p. 218).

“In the absence of external cultural scaffolding [within these crevices] agents will rely on the coherence and ‘regulated improvisation’ made possible by their practical internal dispositions, especially those that produce fast...cognitive emotive judgments of “right/wrong [and] like/dislike....” People will begin to create myths based on “bits and pieces of the external cultural environment” (Lizardo & Strand 2010, p. 218) that operate to justify particular courses of action. Preparation as a practice also seems to have been dependent on regulated improvisation with respect to its particular form and degree (including whether it was had developed from idea to practice in the first place).

In a sense preparedness in this context is best understood as bearing a recursive relationship with unsettlement. First, like but to a greater extent than symbolic isolation and self-reliance, the process of discursively creating future memory appears to reduce unsettlement by shifting the focus away from environmental determinism and towards individualized or community action. In this way it operates as the myth that justifies a particular course of action. It also, however, seems to map the expected result of the operation of the practical consciousness in this context: an improvisational scheme in which people improvise but they do not create modes of improvisation “out of thin air.” Rather, institutional direction matters.

Therefore, the regulated improvisation of preparedness operates both as the motivational and justificatory myth and as the practical consequence of that myth. The act of being prepared, or at least thinking of being prepared, takes the place of the more unsettling discourses of environmentally deterministic visions. It also appears likely that these narratives forestall the point not only of unsettlement but also of recognition of the



unsettlement in the first place. Yet as might be expected the cultural and institutional symbols and tools seemed to be imbued with shallower cultural associations.

Institutional direction and recent experience seem to take the fore here, absent the depth of collective meaning and identity normally associated with narratives of isolation and self-reliance. With greater institutional direction, then, there is less need for the creative deployment of the deep cultural repertoire. This is why self-reliance and preparedness seemed analytically distinct: while an argument could clearly be made that they are related and in practice there was overlap between the groups (for example, the description of a home garden as a potential food source), preparedness evidenced a shallower and more immediate wellspring of the applicable social repertoire of tools whereas the repertoire for self-reliance was deeper and more historically grounded.

iv. Analogy to the Familiar: Strong Institutional Prescription.

In relation to these aspects of environmental change, climate change related flooding has a far closer analog in regular winter flooding, and thus institutional—and more importantly personal—prescription exists through example. The future memory of these events has in most cases a relatively recent mnemonic precedent that obviates the need for creativity. It stands to reason, then, that people tend to remain with traditional way of addressing these issues and there is little, if any, push for responsive cultural retooling. People are settled.

Furthermore, the sense of optimism that was related by survey participants seems to mirror a standard mode of discourse in the community that seeks to identify options to overcome long-standing economic doldrums through the area's natural endowments. In this sense, the default to traditional and commonsensical views of the world maps what

theorists predict in a state of relative settlement. Whether these views tend to differ from those on the CSZ earthquake and tsunami due to differences in the profile of temporal uncertainty, the relatively more politicized nature of climate change compared to other hazards, the unique attributes of this stretch of coastline, or some other factor was not evident. Reduced to its simplest essence, an analogy to the familiar encourages a thought process of “we have this under control already,” the symbols of preparedness encourage and reflect a thought process of “we know what to do and are doing it,” and the symbols of isolation and self-reliance encourage a thought process of “we are the kind of people who will figure this out and survive.”

It is also interesting to consider that these may represent identity-based methods of emotional protection that bear a strong similarity to the strategies described by Norgaard (2011, 2009). In line with her work, it also emphasizes that the cultural and social tools that are available to communities and individuals in response to unsettling realities may also be generative or destructive of predicate unsettlement. Redefining cultural endowments as susceptible to deployment in response to unsettlement, and also formative of unsettlement, allows these related but distinct ideas to be viewed as part of a greater interactive complex of identity, perception, knowledge, and future memory that influence the ability and willingness of communities to embrace certain plans of responsive action. As with preparedness, these factors may work in a recursive fashion, influencing their subject identities through thought and action, which in turn influences the cycle as it begins its process of reproduction and reconstitution anew.

d. Summary.

Table 2 summarizes the linkages between the theoretical expectations of Lizardo and Strand (2010) and their putative analogs in the field of environmental change, as have been described in this study. At risk of overemphasizing the categorical differences between the four described discursive categories, it draws together the four observed categories with their closest analog found in this literature. Moving from a state of settlement to unsettlement first begins with a distinction between approaches to climate change related risk and risk arising from earthquake and tsunami.

Analogy to the familiar allows for recent experience and tradition expressed as common sense to predominate, effectively disarming potential unsettlement. Where institutional prescription in the form of preparedness efforts discursively predominate, discourses focused on preparedness acts in a cyclical fashion both as a cause of regulated improvisation and its outcome. Where the narratives told by people essentially denied any sort of institutional precedent or direction for their vision of the future, discourses shifted to symbolic isolation and self-reliance.

This appeared to help stave off the later stages of recognition that were necessary for a fuller embrace of environmental determinism. For each applicable thought community the chosen discursive frame appears to have influenced, in its own way, relative unsettlement. Building off of observed similarities, a framework has thus been created that allows for developments in sociological theory to be transposed upon discussions of environmental change. Through the use of this method it is possible to translate some of the stories that communities tell themselves about future environmental

risk into a theoretical framework that was developed for the purpose of describing how changes in ideology and action may be formed.

Table 2. The Stages of the Breakdown of Socio-Cognitive Scaffolding and Analogs within Observed Reactions to Environmental Risk.			
	Discursive Consciousness Level of Prescription or Recognition	Practical Consciousness Level of Prescription or Recognition	Analogs in Narratives of Future Catastrophic Environmental Change
Stable, pre-existent socio-cognitive scaffolding	<p><i>Strong External Prescription</i> Quiescent, reliance on and cognitive exploitation of objectified institutional structures to generate and organize lines of action.</p> <p><i>Gaps in the institutional order</i> Active, “cognitively optimal” use of already existing and widely shared vocabularies of motive, reliance on “institutional myths” to explain action; loose coupling or “dissociation” between justifications for action and actual patterns of action.</p>	<p><i>Strong External Prescription</i> “Ontological complicity” between embodied habits and skills and objectified institutional orders, unconscious schematic transfer across institutional domains.</p> <p><i>Gaps in the institutional order</i> Production of globally coherent lines of action through “regulated improvisation” in unstructured choice situations; criteria of judgment refractory to discursive consciousness and hard to verbalize and “redescribe” into public language.</p>	<p><i>Analogy to the Familiar.</i> Narratives that describe and conceptualize the world by reference to known or sincerely expected material reality. Perhaps linked to the use of identity and experience in emotional mediation.</p> <p><i>Symbolic Preparedness.</i> Symbols of preparedness and human action takes the fore in the way people visualize the future. In some cases the narrative belies the scope of preparation.</p>
Unstable (or non-existent) socio-cognitive scaffolding	<p><i>Early (before reflexive recognition)</i> Continued reliance on existing vocabularies of motive, cognitively optimal attempts to explain away anomalies.</p> <p><i>Late (after reflexive recognition)</i> Reflexive, “cognitively costly” search for and possible development of novel explicit cultural patterns (“ideologies”), rule-based, consciously monitored schematic transfer across institutional domains.</p>	<p><i>Early (before reflexive recognition)</i> Misfiring/hysteresis/allo-doxia</p> <p><i>Late (after reflexive recognition)</i> Retooling/retraining/acquisition of new habits and skills/readjustment of future expectations.</p>	<p><i>Symbolic Isolation and Self-Reliance.</i> Tradition and identity begin to occupy a more central place in narratives of environmental change, and are more charged with meaning.</p> <p><i>Environmental Determinism.</i> Narratives begin to focus more on the material reality. Potential for update.</p>
The three leftmost columns have been imported from Lizardo and Strand (2010, p. 216). The rightmost column represents roughly analogous observations about how environmental change is visualized.			

## CHAPTER VII

### CONCLUSION

Tierney (2007, 1999) hoped that the sociology of natural hazards would embrace interdisciplinary efforts to understand the social construction of risk in these settings. Moreover, she asked that natural hazards theory not only serve as a passive recipient of advances made in other fields of theory, but be generative of new social approaches to risk and uncertainty. In this paper, an attempt has been made to use disparate fields to theorize a new approach to understanding future catastrophic environmental risk. Moving beyond risk “realism” and categorical approaches to risk, the method presented employs a bottom-up approach to understand how localized thought communities remember an uncertain future: how they visualize potentially horrific events. It was discovered that these understandings are not created out of thin air but rather employ local place histories and identities; the meanings and associations developed between communities and place over time are projected into the way people anticipate the future.

Using recent theory that was primarily focused on harmonizing the cultural toolkit theory originally described by Ann Swidler and strong practice theory developed by Pierre Bourdieu, an analogy to the way that people interact with the risk of future environmental change was developed. Rather than a holistic demonstration of every perspective on environmental change locally, much less on a broader scope, four distinct narratives of future memory emerged. While defying the sort of categorical distinctions that tends to facilitate easy analysis, they corresponded neatly with categories that have been used to explain the development and effects of social unsettlement. By extension

they link to theory about the operation of ideological and behavioral update in response to changing circumstances.

A secondary benefit of this method is the useful merger of historical periods, beginning with products of the settlement of the area by people of Euro-American descent, moving forward in time through successive periods of resource extraction and economic flux, and continuing into the present day. Socially constructed narratives of environmental change in this community, and likely many others, are best viewed along a temporal continuum beginning in the distant past, incorporating the stories of history and the present, and continuing into the future. Efforts to plan and prepare for these changes on a local level should recognize that the way people understand environmental change is often not grounded in the material reality of the present or the future, but is an amalgam of material and social realities, past, present, and future.

Going forward this method presents a basis to extend analysis of social vulnerability and natural hazards planning beyond the mere use of broadly defined social and demographic categories as proxies for risk. An approach that takes into account localized understandings of the meaning of place and community and how each influences the way that the future is remembered provides an opportunity to better understand our interactions with environmental change, especially when the scope and form of that change remains uncertain. Of course, even in a local context the patterns of community and place identities that influence our interactions with catastrophic risk are by no means reducible to four analytical categories. In the future these explorations should be applied to understand how environmental thought communities are formed and the factors influencing the bases of those communities and bases of the thought processes

that bind them together. Furthermore additional areas of variability—including the factors that draw people to place, their incentives to stay there, their rationale for either optimism or pessimism, and the salience of various factors that affect their community—may be introduced to explore how these categories, and possibly others, fit within this method for understanding interactions with environmental risk.

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