CHAPTER 7

"We Are Always Getting Ready"

How Diverse Notions of Time and Flexibility Build Adaptive Capacity in Alaska and Tuvalu

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Community-held notions of time, flexibility, and uncertainty, which underpin disaster preparedness planning, are important organizing principles for climate adaptation efforts. However, communities currently facing climate change impacts may simultaneously be on the margins of climate change and disaster planning centers and discourses. Subsequently, notions of time and preparedness may not translate smoothly between boardrooms and community settings. Flexibility in the face of uncertainty—for instance, about how and when global climate change will manifest locally—is critically linked to these personal and community interactions with time. That is, cultural relationships with time imbue how people cope with, and make plans to cope with, risk and uncertainty. In some cases, the ability to preserve flexibility is a critical contribution to building adaptive capacity in response to disasters precipitated by climate change. We explore the intersections of time, flexibility, uncertainty, and adaptation planning in two case studies from communities in very different settings—the village of Shishmaref in Alaska and the country of Tuvalu in the southwest Pacific Ocean—both of which are already negotiating the effects of a changing climate and of planning efforts designed to mitigate climate change impacts.

Consider an afternoon in May, 2010, when Fred Eningowuk, a resident of Shishmaref, Alaska, asked the Immediate Action Working Group (Working Group)—a network of State of Alaska and federal agency workers tasked with responding to communities for whom the risk of extensive flooding had become critical—for help moving a bulk fuel container. Shishmaref is not eligible for new fuel containers, along with much in the way of state-sponsored infrastructure development, since the community

voted to relocate in 2002 because of flooding pressures, but eroding fuel containers are a big problem in the small community. In order to help, a neighboring village donated its retired—but still working—fuel container, but moving the large piece of equipment was beyond the capacity of the small village's transportation capabilities, leading to Eningowuk's request to the Working Group.

The Working Group, located in Anchorage, was silent in response to this request. Fuel tanks are not part of their mission statement. On this particular day, the Working Group was meeting remotely with several Alaskan villages to identify assessment strategies for adding new communities to the classification of "most at risk," and carrying out projects such as new flooding and hazard maps. The agenda for the meeting dictated that the topics of discussion should concentrate on these tasks for four hours and twenty minutes, with the last ten minutes were opened for public discussion and unplanned input from community leaders and representatives listening in over the phone.

There is nothing unusual about this interaction, but we see that there can exist divergent understandings of what constitutes preparation between different actors in bureaucratic meetings aimed at building adaptive capacity to deal with disasters and climate change. Because of this, government planning meetings between local communities experiencing or preparing for disaster and the government representatives charged to assess and offer assistance, aid, and in some cases relief from acute risk, are rich ethnographic moments. In the above example, the Working Group's discussion centers largely on drawing categories of risk and measuring risk in the future, while Eningowuk's discussion brings up an unexpected (by the participants in Anchorage), immediate need in the present. These differences indicate unique and situated experiences of risk as a construct that exists, for example, in the evolving present (fuel tanks) or something that is located and predictable in a not-yet-upon-us future (where is it likely to flood next?). Notice also how that unique and powerful cultural artifact of the agenda dictates time allotted to appropriate topics of risks and adaptation. These differences in what constitute appropriate topics indicate power dynamics during adaptation-planning interactions and help point to what are acceptable time frames for—and of—engagement within bureaucratic settings.

Interactions such as these are cultural performances of the kinds of risk mitigation and management strategies that are acceptable within and across social and cultural actors and institutions. Disaster planning becomes an ethnographic hot spot for understanding divergent experiences of risk, climate change adaptation, and disaster preparedness among stakeholders. *Ethnographies of communication* (Hymes 1964) help

to make visible the suite of experiences and conceptual frameworks that various stakeholders bring to the locations and events where disaster mitigation and climate change adaptation are discussed; through these ethnographies anthropologists gain a better insight into the spectrum of meanings and experiences of disaster planning, and which meanings and experiences have value within centers of decision making.

In the following chapter we discuss how culturally appropriate and locally derived notions of flexibility and relationships with time and uncertainty in Shishmaref and Tuvalu offer remarkable and well-situated frameworks for thinking about adaptive capacity in their respective locales, and yet how these notions of flexibility can be overlooked by agency workers and nongovernmental organizations (NGOs). We hypothesize that these concepts of flexibility can be difficult to incorporate into bureaucratic institutions, in part because they confound the limited notions of time and task that become habit within bureaucratic cultures and protocol. By highlighting some situated experiences of time and task in Shishmaref and Tuvalu, we hope to demonstrate that flexibility, constructed in relationship to time- and task-orientation, can be expanded on to support adaptive capacity in these island communities, as well as potentially to support adaptive capacity in other communities and locales around the globe.

Our insights are ethnographically grounded in fieldwork conducted in Alaska and Tuvalu and ongoing conversations with residents of these places, and are supplemented through discourse analysis of texts and films produced in media and policy contexts. Our close observations of community engagement and climate change adaptation processes over the past decade allow us to explore the evolving ways that people interact with their shifting physical and policy environments. From this vantage point, we compare and contrast the experiences and situations in the Arctic (the community of Shishmaref, Alaska) and in the tropics (the low-lying island communities of Tuvalu). This comparative perspective, between places in very different geographic settings, allows us to comment on some broader patterns that emerge from the specific details of each case.

Climate Change and Vulnerability: Unfolding Disasters in Shishmaref and Tuvalu

Anthropogenic climate change is causing shifts and reverberations throughout the earth system, which in turn create both known and unknown effects in ecological and social systems (Maslin and Austin 2012).

For human communities and individuals, these changes will be experienced in part through the increasing likelihood and frequency of rapid-onset hazards such as intense hurricanes, fires, large storms, and flooding, and through slow-onset hazards such as erosion and drought (Oppenheimer et al. 2014). Anthropologists and other social scientists understand, however, that exposure to hazards and experiences of disaster are filtered through underlying social conditions including access to political power, economic and social capital, social geographies of race and ethnicity, risks linked to gender and age, histories of colonization, and many other cultural and social conditions (Kelman, Gaillard, and Mercer 2015; Lazrus 2012; Marino 2012, 2015; Oliver-Smith 2004). Because of this, marginalized and vulnerable communities will experience hazards more acutely, creating socially constructed disaster situations that may result in death, diaspora, loss of infrastructure and property, and social disarticulation, among other negative outcomes. Communities that are vulnerable to adverse outcomes of climate change are frequently also communities that have historically contributed least to greenhouse gas emissions—such as Shishmaref and Tuvalu. Thus, the combination of least developed, least culpable, and most likely to experience negative effects of hazards related to anthropogenic climate change make climate change-related disasters a critical ethical issue (Marino 2015), as well as an important human rights issue for the twenty-first century (Adger 2004; Watt-Clouteir 2015).

Thus climate change—its causes and consequences—exists not only as a set of biophysical outcomes, but also as a set of decisions, rules for decision making, networks of actors, pools of financial resources, legal agreements, publications, and communicative events. These sets of discourses determine how, which, whether, and when people will make changes to physical and social landscapes to prepare, mitigate, and adapt to changing ecological conditions. Both physical outcomes of climate change and climate change discourses enter a stratified society (Marino and Ribot 2012). Whether climate change discourses and resulting policies exacerbate inequity to power and decision-making, or whether climate change discourses provide opportunity to reimagine the power dynamics among sets of actors, is an area in need of greater empirical investigation.

Of course we know that climate change discourses and the actors who participate in them are heterogeneous, both within and across cultural contexts. As such, some situations in which international political actors discuss climate change create new opportunities for traditionally marginalized communities and leaders to make themselves heard. In 2009, for example, Tuvaluan representatives criticized the text and procedure leading to the Copenhagen Accord produced by the Conference to the Parties (COP) to the United Nations Framework Convention on Climate

Change (UNFCCC), refusing to sign a nonbinding deal brokered by the United States, India, China, and South Africa (International Institute for Sustainable Development [IISD] 2009; Radio New Zealand 2009), leading to widespread protesting and international attention. In another example, representatives from Shishmaref and other communities in Alaska met with President Barack Obama in 2015 when he visited the state—a meeting spurred, in part, by the president's personal investigation of climate change outcomes and acknowledgement of rural Alaska leaders and thinkers as being on the forefront of this global phenomena. In the Arctic in particular, Sheila Watt-Cloutier and the Inuit Circumpolar Council successfully moved the climate change agenda to include Inuit concerns and successfully positioned Inuit knowledge systems as critical to global climate conversations (Callison 2014). These examples point at an emerging vocality of historically marginalized populations in the climate debate.

While the above examples offer great promise, other research has demonstrated that international discourses on climate change and climate change adaptation have reentrenched pathways of inequity and exploitation. This happens repeatedly when powerful actors simplify disaster experiences for small island communities, such as those in Tuvalu, and small indigenous communities, such as those in Shishmaref. Media coverage often repackages these experiences as metaphors (e.g., conjuring ideas of a canary in a mine, a litmus test, or the drowning islands of Atlantis) and illustrate simplistic anecdotes that serve to justify the desires and actions of more-powerful institutions (Beymer-Ferris 2012; Farbotko and Lazrus 2012; Marino 2012). In these instances, marginalized voices are diminished even as the exotic cache of these voices is used to sell newspapers and further preexisting agendas (Farbotko and Lazrus 2012).

Investigating communicative events surrounding climate change and the adaptive capacity to anticipate and cope with climate-related disasters, as we do in this article, may contribute to establishing equity in climate change-related discourses, including mitigation interventions (e.g., international policy, funding for hazard mitigation and adaptation) (Marino and Ribot 2012). We hope to show how capitalizing on situated concepts of flexibility in the face of uncertainty born both of a changing environment and of the social processes that lead to disasters can offer insights into supporting more inclusive forms of adaptive capacity planning and can open bureaucratic institutions to alternative pathways of engagement.

Shishmaref and Tuvalu

Shishmaref, Alaska, is a village on a low-lying, barrier sand island that is sandwiched between the Chuckchi Sea and the Shishmaref Lagoon. The

community is primarily Iñupiat, and self-identify as the *Kigiqtamiut* (literally, people of the island). The *Kigiqtamiut* have inhabited the extensive coastal areas around the island for at least three thousand years in family groups, each of which is identified by different land tenure and political affiliation (Burch 1998). In contrast to Shishmaref's Arctic setting, Tuvalu is composed of nine low-lying coral and atoll islands that form an arc across the Pacific Ocean just south of the equator. Approximately ten thousand residents live in the archipelago, and are descended from Polynesian voyagers who settled the islands roughly two thousand years ago when sea levels fell during a small ice age and exposed the atolls (Nunn 2007).

Despite vastly different geographical settings, both areas have experienced social and political constraints tied to colonization and both experience similar effects from extreme weather and storms. Shishmaref is threatened by flooding brought by fall storms that come off the Chuckchi Sea; as storm intensity and erosion increase, these floods become more threatening to lives and homes. As oceanside bluffs erode, the likelihood of a large-scale disaster that claims lives and critical infrastructure increases. Erosion can be slow onset, or can be sudden and dramatic during a storm event. In 1997 a large storm took approximately ten meters (thirty-two feet) of land in a single night. In total there have been six state flood disaster declarations issued for Shishmaref since 1988 (Kinsman, DeRaps, and Smith 2013). Similar to Shishmaref, Tuvalu is also affected by storm activity. Cyclones and storm surges *kai fenua* (literally meaning to eat the island). In March 2015 the winds and surge from Cyclone Pam, the season's most intense tropical cyclone in the southern hemisphere, resulted in waves up to five meters breaking over some of the Tuvaluan islands. Infrastructure was damaged, houses flooded, crops ruined, and families driven to evacuate. Annually, king tides also eat at the coast lines of the Tuvaluan islands. These perigean spring tides raise water levels higher than normal, and can be driven even higher by a full or new moon, storm surge, la Niña conditions, and climate change-driven sea level rise. The Tuvalu Meteorological Service has recorded maximum tides of 3.4 meters (occurring on February 24, 2006, and again on February 19, 2015), significant in a country with an average elevation of just 4.6 meters above sea level.

Seawalls and revetment projects have been common responses to encroaching waves in both places. Since 1981 more than $10 million has been spent on seawall projects in Shishmaref. These protective revetments have a life expectancy of fifteen years if not properly maintained and twenty-five if regularly maintained (Gray et al. 2011). There is disagreement on the efficacy of the current seawall in Shishmaref (Mason et al. 2012), but historically seawalls in Shishmaref have been infamously ineffective. One revetment project intended to protect the coast from greater

erosion failed a few weeks after it was constructed at great cost to both the state and the village (Mason et al. 1997, 106–110; Mason et al. 2012). In Tuvalu, wave energy tends to scour the coast where seawalls have been installed, exacerbating the loss of land. In many places, seawalls have tumbled down and their components used for other structures including boat ramps. In a few cases, the seawalls become dams, preventing sea water that overtops the walls during high tides and storms from returning to the ocean. The trapped sea water kills vegetation and infiltrates the narrow freshwater lens, leaving soil infertile for decades. Almost all stakeholders in Shishmaref and in Tuvalu agree that seawalls and other revetment projects are not a long-term solution to flooding and erosion.

Given the common threats and inadequate infrastructure solutions in both places, community members in Tuvalu and Shishmaref are faced with extremely difficult considerations concerning relocation (Marino 2015; Mortreux and Barnett 2009). Numerous documentary films and popular media articles attempt to capture how people in Tuvalu feel about a future relocated from their home islands, illustrating an early climate refugee crisis. The lived experience of climate-related sea level rise and associated decisions, however, is complex. Tuvaluans resist the label of climate refugee (Farbotko and Lazrus 2012), even finding ways to cement connections to place in the face of discourses about relocation (Farbotko, Stratford, and Lazrus 2015). While there are currently no specific policies in place to aid migration in response to climate-related changes in Tuvalu, some people who have relocated to Australia or New Zealand—or who plan to do so—cite climate pressures among their reasons. In at least one case, the New Zealand court has recognized climate refugee status of a Tuvaluan family, granting the family residence (Farbotko, Stratford, and Lazrus 2015).

Shishmaref residents consistently and unanimously resist relocating to a more urban environment or merging with a preexisting village, but in 2002 the community voted to reestablish the community on the mainland, within subsistence hunting territory (Schweitzer and Marino 2006). Reconstructing a village on the mainland would require significant state and/or federal support to develop critical public infrastructure such as schools, an airstrip, a post office, a medical clinic, and other infrastructure, as well as planning for this infrastructure. The burden of these costs has not yet been allocated in state or federal budgets, but residents are currently in talks with state and federal agencies to set out a plan for short-term protection of the island as it is today, and long-term planning for possible relocation.

Under these conditions, residents of both areas negotiate strategic development and relocation planning with agency workers along hierarchies of government institutions and through programs of international aid,

as well as among local governments and family groups. It is within these negotiations and advocacy arenas that divergent experiences of risk and timeframes for adaptation emerge.

Task Duration

One evening, Shishmaref resident and friend of author Elizabeth Marino, Nancy Kokeok, was cleaning seal hides. Kokeok worked slowly and cautiously, running the *ulu* (women's knife) along the edge of the fine, spotted animal hide. It's a job that takes a delicate touch to get the soft pink blubber off the sealskin with the sharp knife without nicking the skin itself. These skins are used for *mukluks* (boots), mittens, and hats—all of which need continuous swaths of skin to make them water proof. A hole interrupts these swaths and cannot realistically be sewn back together to make a full, waterproof piece—so this challenging skill of scraping is critical to making sufficiently warm Iñupiat clothing. It was getting cold and dark in the early spring, and Marino asked Kokeok if she was hurrying through her last seal so she could get inside and warm her hands, which were wet from the work. Marino was, in fact, hoping Kokeok would hurry up so that the inexperienced anthropologist could go inside and warm *her* hands, which were not wet from work. "What do you mean?" Kokeok responded. "It takes as long as it takes."

The sentiment "it takes as long as it takes" is not uncommon in rural Alaska. Seeing a task through to completion demonstrates what outsiders might call patience, but bespeaks a more ubiquitous understanding of due diligence, work, and flexibility with time. The notion of seeing a task through to completion is a concept that is infused into life in rural Alaska and one that can grate against bureaucratic protocol. Of course individuals break from a task when necessary, but task-driven engagement, as opposed the clock- and calendar-driven partitioning of time (Postill 2002), breaks the formal organizing structure of most meetings held by outsiders in Shishmaref. To see something through to completion requires a relationship with time that is less rigid and more amenable to surprises and unexpected diversions. The differences between task-driven engagement and clock-driven engagement are particularly striking with regards to notions of speaking, being silent, and being heard.

In Shishmaref, an elder may get up to speak at a meeting about what may seem like a divergent topic; but it is common that when people speak they are given the floor until they are finished. Under these conditions, the divergent topic nearly always winds its way back to convey a profound insight to the conversation at hand. This relinquishment of the floor for

unspecified amounts of time is not the organizing structure for most formal engagements sponsored by outsiders—even among people who try and demonstrate cultural sensitivity in an Iñupiat context. Nicole Gombay writes about the awkwardness and profound discomfort of the audience at an Inuit studies conference when a senior Inuk, Peter Irniq, went over his allotted time during a luncheon speech and ran into the time when paper sessions were to start (Gombay 2009)—and this audience was made up of people gathered to talk about Inuit society! Similarly, in Tuvalu, elders speak first when community members gather in the *maneapas* (open-air community houses). There, too, elders, especially members of the *falekaupule* (island leadership), weave together what initially appear to be disparate and seemingly mundane topics, even gossip, ultimately arriving at insightful conclusions that may not have been evident through a more direct style of oration (Besnier 2009).

During meetings like the example with which we opened this chapter, we also see the critical influence of the agenda as a cultural object of great power. These meetings often assume an agenda and chronological progression from one item to the next with limited and clearly defined time allocation for each topic. Under these conditions there is little room for conversations to diverge from agenda topics, for unknown and unexpected topics to emerge, or for solutions to play out after discussions take as long as they take. It might, in fact, be antithetical to some notions of successful engagement to begin a meeting by announcing, through an agenda, when it will end.

We offer these examples of situated tasks to illustrate how daily life may be organized in ways that prioritize the task itself over the clock- and calendar-driven partitioning of time (Postill 2002) that dominates in offices, board rooms, and laboratories around the world where climate-related science, discourses, and policies are often developed. However, as Postill demonstrates, we are careful not to assume that the temporality of tasks and schedules in Shishmaref or Tuvalu is fundamentally distinct from the clock and calendar time of global centers of science and planning, but that clock time is just one of many elements involved in scheduling and planning. In other words, activities are planned in ways that reflect how time is made meaningful according to the tasks at hand or the situational context. Hall's (1959) descriptions of monochonic and polychronic time have been influential in anthropology, contributing to our understanding of how people organize space and time to communicate nonverbally, including the message conveyed through the particular ways in which a task may be accomplished. Interrogating the partitioning of time in disaster studies lends a richness to understanding how people interact with scheduling and planning and gives rise to the idea that a singular method of scheduling

may undermine solutions that could arise more easily under different social conditions. In other words, decolonizing meeting spaces, and their unique notions of time, might actually lead to different kinds of solutions.

Foresight: Is Prediction the Only Basis for Climate Change Knowledge?

Climate change information and knowledge created and disseminated by scientists and by global initiatives such as the Intergovernmental Panel on Climate Change (IPCC) are overwhelmingly about prediction. Knowing the future and what the future will bring seems essential in global climate change discourses for knowing how to prepare, what to mitigate, and where to put adaptation funding. Asking, "Where and when will the next storm be?" can seem like the only rational way to begin preparing for climate change, particularly when landscapes are becoming uninhabitable and migration is becoming necessary. A recent UK government-funded series of reports on climate change, among other issues, is titled *Foresight Projects:* and claims "Foresight uses the latest scientific evidence and futures analysis to address complex issues and provide strategic options for policy." (The Government Office for Science 2013, accessed April 18, 2016).

Foresight is an integral part of our understanding of how to prepare for climate change in the coming centuries, and yet the idea of foresight as prediction or knowing the future is not universally embraced as a prerequisite for preparedness (Taddei 2012). We note the concept of foresight makes particular presumptions about the construction and partitioning of time. As Bates writes, "Assumptions about time as a linear flow of constant rate, with neat chronologies linking events in the past, present, and future are convictions that are deeply embedded in Western thought" (2007, 88). In many climate change discourses, the future as a distinct, linearly defined, point is a deeply embedded conviction; adaptation planners can even take the additional cognitive leap of the future as being knowable and predictable.

Climate change institutions and social discourses of climate change themselves are organized around these principles of the future being knowable (Taddei 2013). To build projections about the future global climate and its more local effects, climate modelers make assumptions about deterministic social and physical systems and about their relatively linear, and relatively knowable, evolution (Shackley and Wynne 1996). These assumptions are culturally embedded and socially negotiated. Fine explains, "Predicting the future is social, both in the act of prediction and in the organizational infrastructure that permits its acceptance" (Fine

2007, 134). Lahsen (2005) describes the complexity involved in projecting the future climate, including the levels of certainty with which modelers imbue the models and model outputs and thus both how future time is measured and known.

Today, climate change research and policy-making organizations place enormous value and resources on a preoccupation with knowing the future as the single most important mechanism for preparedness. The IPCC qualifies predictions of change as *more likely than not, likely, very likely, and virtually certain* (Cubasch et al. 2013). The demarcation of degrees of certainty about the future is a perfectly adequate way to think about the climate system and within a scientific epistemology may lead to building adaptive capacity in places that are very likely to experience damage, for example. This likeliness of damage is one reason anthropologists work with and are interested in communities such as Tuvalu and Shishmaref in the first place. On the ground in Tuvalu and Shishmaref, however, local notions of preparedness and adaptive capacity do not *necessarily* rest on knowing the future—though of course, local leaders, administrators, and scientists can and do engage these conversations.

The degrees of certainty with which the future can be known are problematic outside of the context of the IPCC report, and especially when translated to local communities experiencing change. As Polynesians, many Tuvaluans interact with time in ways that make it hard for them to conceive of certainty about the future. According to some Polynesian knowledge systems, we walk through time in two directions. One may walk forward into the past (which we can see because we have experienced it, therefore it is in front of us) and walk backward into the future (which we cannot see, and therefore is behind us) (Salmond 1978). The present in this temporal conception is a composite of future unknowns and past experiences that is shifting and negotiated. The past, in front of people, can serve as a guide in the ever-changing present. In this construction, therefore, it is the past that guides, not the future, even and especially under novel conditions. The present is malleable and uncertain. During fieldwork, people from Tuvalu talked about the changes they observed in their environment as deviations from expectations based on oral histories and lifetimes of interacting with the weather, ocean, and water. Thus, coastal erosion and precipitation changes were known—not because of projections of the future, but because of comparisons with the past. While this is not a unique feature of Tuvaluan understanding, it does present a contrast with the presentation of information derived from climate models of future projections that we need to acknowledge; we must build a bridge between these ways of knowing in order to align priorities about planning.

Similarly, in Shishmaref, predicting precise ecological futures can be problematic because assuming one knows what the future will be can be seen as a severe form of hubris (Wisniewski 2010)—and while this does not eradicate a sense of what may come—taboos on knowing and being certain about the future place parameters on acceptable discourses and mechanisms for preparedness. These ethics are coded into the language used to talk about the future. One consultant in Shishmaref made this point, early in the research process: "When we talk about this sort of stuff [flooding in the future] it's almost like we have to joke. You have to learn to talk to people here if you want to know about this stuff."

Adaptive Capacity in an Uncertain World: *Toka* and Getting Ready

In Tuvalu and in Shishmaref we find that preparing for uncertainty, not predicted outcomes, is a central organizing tool around which adaptive capacity is often built outside of bureaucratic settings. Many everyday practices provide preparedness for unanticipated events and are a way of coping with uncertainty—whether that is uncertainty *that* something will happen, or uncertainty *when* it will happen. In Nanumea, the northernmost atoll of Tuvalu, the notion and practice of *toka* is about being ready. *Toka* is often used in the context of familial obligations during funerals or other unforeseen events including disasters—from droughts that reduce coconut availability to marine infestations that kill important subsistence species. If a family is *toka,* it is prepared with surplus items to fulfill food requirements to feed extended relatives following a death or to keep the family fed when harvests are slim. The importance of *toka* has faded with the introduction of the cooperative store and a few small businesses from which canned or frozen meat, noodles, and rice can be readily purchased at a moment's notice—depending on when supplies are replenished by the infrequent boat visits. Given the unreliability of imported food supplies, *toka* is still a strategy many families use.

Toka is not explicitly connected to the idea of disaster by people in Nanumea, yet it was brought up in field interviews in response to actions that could be and are taken to mitigate the impacts on households of droughts, storms, or infestations when food or water supplies might be imperiled. *Toka* represents a way of being flexible, given the uncertainty of the future. The rafters of open-air *fales* (houses) in the outer islands are often filled with aging coconuts that are a delicacy at the best of times, and an infusion of nutrients at the worst of times. These brown coconuts are a visible indication of whether a household is *toka.*

Arguably, with the increased reliance on cash economy, people in Nanumea are becoming less flexible—for example, people rarely have surplus cash due to multiple financial demands from church obligations and school fees, so when people need to buy unanticipated supplies they are sometimes unable to do so. Confounding that constraint, in Tuvalu, especially in the outer islands, supplies in the island shop often run low, for example if a boat has not visited for several weeks or if someone else has had cause to purchase large amounts of imported food. Still, the concept of *toka* is present and can be used to frame a culturally relevant discourse of preparedness.

In rural Alaska, preparation for uncertainty is captured in a similar phrase, getting ready. Getting ready is an integral part of daily life and stands out as a particular relationship with the unknowable future. This concept of getting ready is a practiced, intricate part of daily life in Shishmaref, and is as ubiquitous as it is difficult to grasp. Breakfast is always a full meal, a way of preparing for whatever the day will bring. You always take extra food when traveling. You watch, listen, and make yourself ready in the present for what might happen in the future. Bates argues that this preparedness does not negate conceptions of the future or ideas surrounding forecasting and prediction, but rather that the future is, by its very essence, unknowable (Bates 2007). If the future cannot be fully known, preparedness must take place in the present for a spectrum of possible outcomes.

This explicit relationship with uncertainty and preparing for uncertainty, however, is beginning to seep into scientific discourses as well. Some Western scholars and practitioners are starting to interpret the future in ways less confined to the parameters of what is considered known and knowable, developing the notion of flexibility. Flexibility is particularly useful in dealing with climate change, where models of local outcomes and how those outcomes will interact with social systems are extremely complex and difficult to predict. In Western technical jargon this may be called the "precautionary principle." That is, in situations when an activity threatens to harm the health of humans or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically. In other words, do no harm under conditions of uncertainty.

In climate modeling of future climate-related changes, modeling that yields projection of the future, ensemble work is important. Several models of future climates are used in ensembles that indicate a range of possible outcomes based on each models' outputs. This spread allows modelers to indicate directions and possible degrees of change and to move away from deterministic predictions. Yet the forward planning—days, weeks, years, decades in advance—still embodies certain notions

of time and what is knowable and unknowable, even if uncertainties are acknowledged.

Despite these new discourses of uncertainty emerging in scientific settings, in practice, climate change adaptation discourses are still heavily dependent on forecasting. In Shishmaref, for example, the Army Corps of Engineers has designated various village sites as having 15–20, fewer than 100, or more than 100 years before flooding is likely to make places uninhabitable. Government planners see these numbers as essential determinants for setting priorities. These observations lead us to wonder what adaptive capacity built around uncertainty, rather than prediction, might look like.

Conclusion

Relationships to time and the future are not static, nor are they singularly defined by cultural identity or geographical location. The question we pose here is how different conceptual engagements with time may influence strategies for preparedness and methods of building adaptive capacity. We see that they can influence preparedness and adaptive capacity profoundly, particularly around the idea of flexibility and relationships to uncertainty and an unknowable future. Of course, Alaska Native and Tuvaluan scientists and politicians are fully engaged participants in the IPCC and other central drivers of the foresight narrative, and as such fluently inhabit diverse conceptualizations and vernaculars of time. Conversely, an emerging generation of anthropologists are consciously bringing attention to nonhuman agency and actors, including weather and other ecological systems that render the future less and less knowable (Havey 2005; Sillar 2009).

By examining the cultural relationships with time that underpin flexibility in the face of uncertainty in Shishmaref and the islands of Tuvalu, we are inspired to question assumptions about the need for certainty in planning. One implication of this insight is to reduce the emphasis on the need for more-precise climate projections about the future, and instead to prepare communities in the present for a suite of possible risks. Along the lines of arguing for the precautionary principle in climate adaptation (Lewis 1999) these findings also help us see alternative and culturally relevant ways of interacting with climate projections, and the agencies and agendas that are designed to address the impacts being projected. Another implication is how we can think of disasters not as discrete events, but as events embedded in and produced by the uncertainty of a changing climate on one hand, and of social vulnerability on the other. Systemic vulnerability—entrenched in political and economic processes with deep his-

torical roots—is another source of uncertainty that extends the causes of disasters beyond any sort of discrete timeframe or singular driver. A final outcome of this interrogation of time is an understanding that "managing the future" as a risk reduction strategy is a culturally constructed model. We can, then, posit the idea that there are other ways to handle risks in the present and the future, including orientations that deal more directly with historical inequities as a risk management strategy.

The examples we provide here show that the meaning—and implications—of uncertainty shift between boardrooms and communities. Getting and being ready—whether for the vagaries of everyday life, for life-altering events such as funerals, or disasters—are ways of making uncertainty meaningful and productive through specific cultural practices that boost a person's, household's, or community's ability to deal with the unanticipated. Here, we demonstrate what Gregory Button has previously called for from disaster anthropologists: how an ethnographic approach "can unveil the social, cultural, and political meanings inherent in the nature of uncertainty, which are too often ignored. By contextualizing uncertainty in the domains of culture, meaning and power, we create [a] coherent idea of its role in society" (Button 2010, 16). Supporting grounded conceptions of flexibility, based on particular relationships with time, can make local strategies of preparedness powerful antidotes to the power discrepancies and climate risks that render some communities' futures particularly uncertain. In other words, contextualizing uncertainty, in this case, might shed light on and bolster support for strategies of preparedness that have been there all along.

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Note

All translations in this chapter were completed by the authors.

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