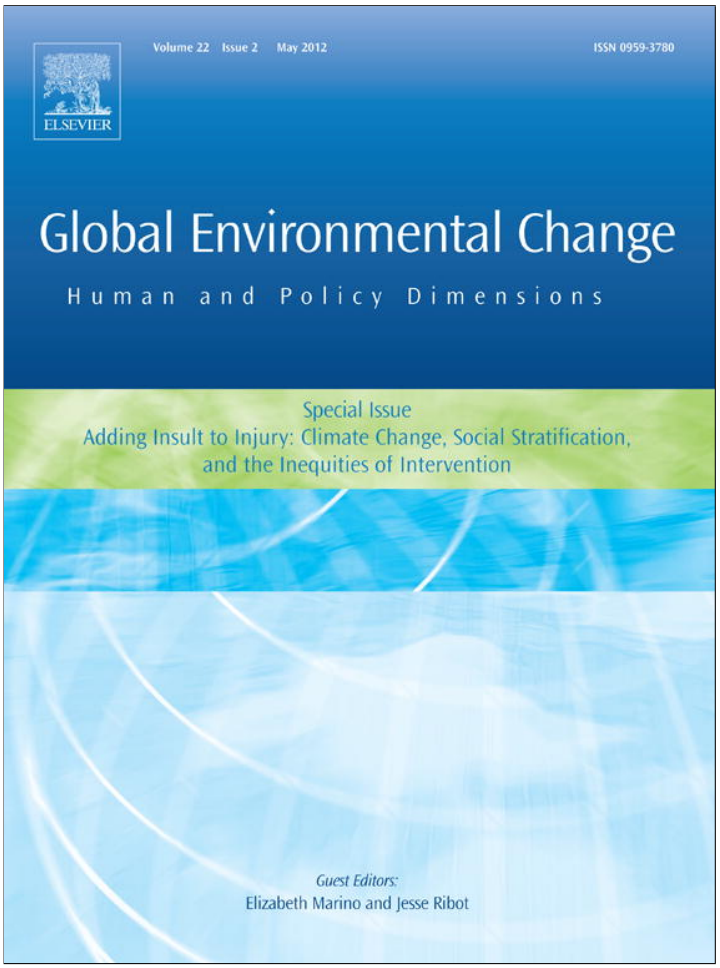

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# The long history of environmental migration: Assessing vulnerability construction and obstacles to successful relocation in Shishmaref, Alaska

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ABSTRACT

Migration decisions are complex and are linked to multiple vulnerabilities, including changing ecological conditions precipitated by climate change. As ecological thresholds are met, community-wide migrations will become more common. These community-wide migrations are more likely to occur to already vulnerable populations, and may levy high social costs. In order to prevent the negative outcomes associated with forced migration and diaspora, policy intervention is likely. Our research examines the case study of Shishmaref, Alaska, where relocation as an adaptation strategy to changing ecological conditions is the only sustainable option. We find that the colonial history in Shishmaref is explicitly linked to contemporary exposure to hazards and increased vulnerability. We further assess obstacles to a State sponsored relocation. These obstacles include disaster response protocol that does not adequately accommodate climate change scenarios. Relocation planning is further complicated by feelings of mis- and under-representation of local voices in political arenas. This case demonstrates the interrelatedness between historically constructed vulnerability and obstacles to adaptation planning. We also offer unique insight into the details of relocation planning as an adaptation strategy among one of the first community-wide migrations associated with climate change.



## 1. Introduction

Shishmaref, Alaska is a small Iñupiat community that sits on an island in the Bering Sea. The village is located in the very center of Inuit subsistence hunting practices and animal migration routes, but is spatially isolated from the rest of the world. Small planes and infrequent barges are the only way to transport both goods and people in or out of the village. Increased windiness (Huntington, 2000) and storminess (Hinzman et al., 2005), increased erosion (USGAO, 2003, 2009) and diminished sea ice threaten the low-lying island with habitual flooding. As significant, ocean side bluffs continue to erode, the possibility of a life-threatening disaster that renders the island uninhabitable increases. Prior to colonization, the Iñupiat community in Shishmaref was highly mobile (Koutsky, 1981; Burch, 1988, 2006; Berardi, 1999). Previous flexibility to environmental shift and unexpected hazards allowed the community to adapt to abrupt changes. Today, the relatively immobile infrastructure and development requires people to stay in place in order to carry out their daily lives. The state of Alaska and federal government agencies are attempting to work with the community to plan an organized relocation, but there is no clear process for community relocation in response to changing ecological features and increased exposure to flooding. In Shishmaref, migration is inevitable. In Shishmaref, people are waiting for adaptation aid to come from the state. This paper explores how historical inequity and colonial development create vulnerable communities. We examine the financial and organizational obstacles to a state sponsored relocation, and provide data that demonstrates how underrepresented communities feel isolated from adaptation planning at the state and federal level. These conditions, we predict, are present in many communities throughout the world and will be exacerbated as sea levels rise.

Adaptation to climate change will take place across multiple scales and will include a wide range of preventative, anticipatory actions and responsive reactions – from real-time spontaneous reactions following extreme weather events to long-term proactive planning across multiple scales of governance to reduce vulnerability (Thomalla et al., 2006). Human migration – be it temporary, permanent, internal or international – will be among a suite of adaptation possibilities for individuals, families, communities, and governments vulnerable to environmental degradation and changing ecological conditions that threaten human lives and livelihoods (e.g., Warner et al., 2010; Oliver-Smith, 2009; IOM, 2008). Like all adaptation possibilities, migration may be organized, funded, and carried out at multiple scales and at different points in time along an ecological event horizon. Environmental

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migration may take the form of emergency evacuations after extreme flooding events or systematic decreases in development along increasingly vulnerable coasts. Environmental migrations may follow traditional economic and remittance migration paths, or may require the relocation of entire communities to uninhabited land.

While we know relatively little about the outcomes of global climate change migrants, the last century of research on forced migration linked to development and land conservation demonstrates that large-scale forced migration levies high social cost to already vulnerable communities, including social disarticulation, impoverishment, increased homelessness, and increased landlessness, among others (Cernea, 1996, 1997, 2000; De Wet, 2006; Oliver-Smith, 2006). While many researchers today argue that migration may be a strategic and successful adaptation to ecological shift (Morton et al., 2008; Gemenne, 2011; IOM, 2011; Mayer, 2011), the way in which migration occurs and the resources migrants are able to access before, during, and after moving will necessarily shape social outcomes for environmental migrants.

Increased political attention and funding for climate mitigation and adaptation is considered an important step towards: (a) reducing the negative impacts of anthropogenic climate change on human populations (Adger, 2001; Baer, 2006); and (b) sharing the burdens of unavoidable negative outcomes (Adger et al., 2006; Humphreys, 2010; as an example of cosmopolitan justice (Caney, 2000, 2001)). In most instances, adaptation to climate change means taking steps towards reducing vulnerabilities in place, thus reducing migration pressures (Martin, 2009). In instances where climatic changes and climate change related disasters require migration, national and international aid is an ethically responsible response to prevent wide-scale social costs associated with forced migration. This is particularly important in circumstances where populations who have traditionally emitted low concentrations of carbon and other greenhouse gas are experiencing disproportionately adverse effects of climatic changes[1] (Posner and Sunstein, 2008; Comim, 2008), and in some cases the 'double inequity' of high vulnerability and low adaptive capacity (Füssel, 2010). This case study is an early example of the difficulties of multi-scaled response to critical climate change that force relocation.

In Alaska, the most northern US state, many indigenous communities are facing significant flooding events and increased erosion that are linked, in part, to warmer temperatures and other climatic changes (Hinzman et al., 2005; USGAO, 2003, 2009). These villages are both culturally and logistically removed from the political center of the nation; however, they may likely set a precedent as to how US state and federal governments intervene in cases of flooding and erosion that are linked to anthropogenic climate change. As precedent, these case studies are particularly important when considering national and international response strategies to sea level rise and increased severity of storms (Moser, 2005).

In at least three western Alaskan villages, the erosion of coastal areas and increased flooding events are forcing residents to relocate from established areas, making these communities some of the first environmental migrations that can be directly linked to anthropogenic climate change. Raleigh and Jordan point out that "issues surrounding climate thresholds, coping strategies, and cumulative disasters" are not yet fully considered in the migration literature (2010: 105). The Alaskan case studies are unfolding precisely because climate thresholds have been met, cumulative disasters are occurring and traditional coping strategies are failing, due to both social and ecological changes, leading to community wide migration. This makes the Alaskan case studies important as indicators of specific vulnerabilities among environmental migrants and as indicators of adaptation capacity and capacity failures at multiple (local, state, and national) scales to extreme environmental changes.

In this paper we will survey the history of environmental migration in the literature and frame the Shishmaref case study as an example of environmental migration. Following, we will demonstrate important findings from long-term research in the community. First, we will show that the colonial history in Shishmaref contributes to contemporary vulnerability by discouraging a traditional adaptation strategy of high mobility, by excluding local experts from early development decisions, and by relocating decision-making power over infrastructure outside of the community. This is important for understanding the ties between historical vulnerability and exposure, even in cases where ecological conditions are unprecedented because of unprecedented global climate change. Next, we will discuss funding inadequacies in relocation planning. More importantly we will discuss how federal procedures for disaster prevention and recovery are inappropriate and failing under climate change scenarios. This includes US federal policy that encourages rebuilding in place after a disaster, which is illogical in increasingly exposed locations. Lastly, we will present interview and survey data that demonstrate distrust and feelings of mis-and under-representation of local voice in governance structures created to mitigate disaster and organize relocation as an adaptation strategy to changing ecological conditions. If the international community prioritizes fairness in climate change adaptation (Adger et al., 2006), including migration as adaptation, then it is critical to understand the complex variables that lead to vulnerability, obstruct adaptation, and marginalize local voice. These conditions will often occur simultaneously as overlapping, related, injustices, as this case study demonstrates.

## 2. Environmental migration: the extraordinary and the mundane

Human migration linked to environmental change has been a common migration trigger for much of human history. Significant archeological research links slow or abrupt changes in environmental conditions to some of the greatest migrations of humankind, including migrations out of Africa, (Larick and Ciochon, 1996; Potts, 1998; Bar-Yosef and Belfer-Cohen, 2001) and large migrations into North and South America (Kelly and Todd, 1988; Erlandson et al., 2008)[2]. However, by the mid-20th century, human migration linked to environmental change was not considered a major driver in modern migration choices. In 1958 Peterson identified migrations which resulted from an 'ecological push' as 'primitive migrations' (Peterson, 1958 in Morinière, 2009), having little to do with modern economic decisions.

By 1985, researchers began reinvestigating the ties between ecological shift, environmental degradation, and human migration. Contemporary investigation of human migration linked to changing ecological conditions began again in earnest with El-Hinnawi's (1985) report, which defined the term environmental refugee (1985). Following, ecologist Norman Myers became the most prolific researcher, author and activist on the topic of environmental refugees, campaigning for increased attention, funding and concern from policy makers (Myers, 1993, 2001; Myers and Kent, 1995). A debate quickly unfolded in the literature between Myers and Black over who to include in this emerging

[1] This does not necessarily imply that negative outcome distribution is a form of repatriation for past injustices, but can be merely the most ethical option for current circumstances (Caney, 2006).

[2] Scholars believe environmental shift influenced migration into the Americas regardless of whether they identify these migrations as pre-Clovis or Clovis culture.

category of migrants, whether or not the term refugee was appropriate, and how significant a role the environment played in migration decisions (Black, 2001).

Interest in the topic of environmental migrants had already increased after early reports from the Intergovernmental Panel on Climate Change (IPCC, 1990) suggested that human migration would likely be the most significant short to mid-term outcome of anthropogenic climate change. When the International Organization on Migration (IOM) began publishing estimates that in 50 years there could be as many as 200+ million environmental migrants (IOM, 2008; Warner, 2010), public and research interest in the topic exploded.

These predictions of 200+ million migrants shocked and awed the international community and led to a cascade of media stories forecasting widespread migration of vulnerable populations fleeing dangerous and degrading landscapes (e.g., Simms, 2003; Bulman, 2005; Sherriff, 2005; Bhagat, 2009). In Shishmaref alone hundreds of documentary film directors, news outlets and national politicians descended on the small village to capture the first 'victims of climate change', and some of the first environmental migrants. An incomplete list of media outlets that have visited Shishmaref in the last 10 years is astounding in scope and includes: The New York Times, The National Film Board of Canada, The Associated Press, Reuters, People Magazine, Earthwatch Radio, Global Create (Japan), National Geographic Magazine, Maison Radio (Canada), Viverra Films, (Holland), The New Yorker, The Weather Cannel, BBC, Time Magazine, TV Asahi (Japan), ABC News, French Daily Liberation, HBO, the Norwegian Broadcasting Corporation, Thalassa (French Television), HD Net TV, National Public Radio, The German TV network, ZDF, Swenska Dagbladet (Sweden), and CBS News.

The threat of millions of potential migrants from all over the world was an instant sensation. Pictures of homes in Shishmaref falling into the ocean, of hunters on the ice with dog teams, of eroding banks and traditional berry pickers became commonplace in mainstream media (Kolbert, 2006; Conner, 2011; Roosevelt, 2004). These simultaneously romantic, exotic, and tragic photos were captivating, and environmental migrants quickly became the allegorical poster children for climate change issues. (Farbotko and Lazrus, 2012).

Scholars likewise began rushing to define and typologize these migrants, now not only for scholastic purposes but also for legal ramifications, opening a debate as to whether or not environmental migrants should have refugee status as defined by the United Nations High Commission on Refugees (UNHCR, 2006). Scholars worried that migrants fleeing degrading landscapes were unprotected by either national or international policies (Sgro, 2009). In Alaska, Robin Bronen framed Native Alaskan village relocations as a human rights issue and proposed an international human rights framework for establishing relocation procedures (Bronen, 2009, 2011). On February 26, 2008 the Alaska Native village of Kivalina, represented by the Native American Rights Fund and the Center for Race, Poverty and the Environment, brought a lawsuit against nine oil companies, 14 electric power companies, and one coal company seeking monetary compensation in the amount it would cost to relocate the village (NARF, 2008).

In Shishmaref, the media attention seemed to push policy makers at the state and federal level to demonstrate renewed attention and a task force was established to look at immediate needs of communities increasingly exposed to flooding hazards. In spite of all of these efforts, very little actually changed for Shishmaref residents. Flooding threats continue to be ever present and no clear procedure for an organized relocation emerged. At the same time, the expected 'big flood' did not occur. Media fascination with environmental refugees began to wane as expectations were met with a 'disappointing' lack of material.

By April of 2011 Spiegel International released a new media story entitled: *Feared Migration Hasn't Happened, UN Embarrassed by Forecast on Climate Refugees* (Bojanowski, 2011). Among other things, the article critiqued the United Nations Environmental Program (UNEP) of predicting large migration flows and then distancing themselves from these predictions as those migration flows failed to materialize. The United Nations University (UNU) responded, claiming that forecast figures of environmental migrants varied widely because researchers were unsure of climate change scenarios themselves, unsure of how climate change would contribute to hazards, and unsure about how these hazards would affect people on the ground (Fišer, 2011).

Figures for how many environmental migrants will or will not be migrating in the next century continue to be highly debated. Raleigh and Jordan claim nearly all environmental migrant predictions are invalid because they are based on conjecture and worst-case scenario (2010: 108). The early prediction of 200 million migrants by 2050 has been dismissed by some scholars as anecdotal (Castles, 2002; Hugo, 2009). On the other hand, a background paper by the IOM continues to predict up to 1 billion migrants in the next 40 years (IOM, 2011). Needless to say, the numbers are distracting, mostly misleading, and likely inaccurate. Or they may be correct.

Perhaps far more important to the public (and academics and policy makers) is that the image of millions of people from developing states inundating developed states is not likely to occur soon. Environmental migrants, instead, are more likely to migrate within their own borders (Lueck, 2011), follow traditional economic and labor migration routes (Raleigh and Jordan, 2010) and experience environmental degradation as one of a variety of complex, interacting vulnerabilities that push migration (Warner, 2010; Martin, 2009). In other words, environmental degradation due to climate change will occur to already vulnerable and marginalized populations (Adger et al., 2006; Button, 2010; Mearns and Norton, 2010) in ways that exacerbate existing inequities. In most cases, adequate adaptation measures can decrease vulnerability, releasing migration pressures, and allowing people to stay in already established communities (Martin, 2009). In some cases, these additional pressures will lead to migration.

In Alaska, an early report on the needs of threatened communities, including Shishmaref, made the claim: "These problems (flooding and erosion pushing community relocation), which primarily affect small, isolated communities, are difficult to address and due to this are easily ignored" (IAWG, 2008). Instead of the migrating frenzy and epic disaster painted by the last 10 years of publicity, environmental migration is likely to be mundane and commonplace, appearing as just one more injustice occurring to already marginalized people in an already unjust world (Ribot, 2010). As ecological thresholds are reached and cumulative disasters make environments uninhabitable, wider-scale, community migrations will become more common – but may still be 'easily ignored'.

In the absence of media sensation, understanding environmental migration remains monumentally important. This is particularly critical as entire communities are forced to move off of traditional land, as in the case of Shishmaref, threatening cultural stability and individual and family security. As whole communities are forced to relocate, migration may be catastrophic to already vulnerable populations, given what we know about the social outcomes of other forced migrants (Cernea, 1996, 1997, 2000; De Wet, 2006; Oliver-Smith, 2006). If we agree that the burdens of climate change should not be inequitably borne by already vulnerable populations, then it is important to understand the processes of vulnerability creation and collective adaptation planning in the form of organized migration/relocation. Yet,

currently, as Susan Martin points out, "discussion of policies to manage environmental migration is in its infancy" (Martin, 2010).

The following sections present Shishmaref as a case study of environmental migration. We find that vulnerabilities to habitual flooding disasters are tied to colonial histories. We show how disaster prevention is hampered by inadequate funding and inflexible disaster recovery mandates, and how local residents are marginalized from government adaptation and relocation planning. The details of historical inequity and political mandates as obstacles in adaptation planning can seem mundane compared to the media hype of millions of fleeing migrants. However, we believe understanding the processes of vulnerability construction and organized relocations are critical to the goal of equitably distributing negative climate change outcomes.

## 3. Methods

To understand local, embedded practices of social and political relocation planning, anthropologists spent a total of 6 months in the village of Shishmaref, Alaska collecting interview, survey, life history, oral tradition and ethnographic data. In total over 40 interviews and 30 household surveys were conducted along with countless hours of informal conversation with local residents. Ethnographic methods included participation in meetings with government representatives in Anchorage, Alaska in person and via telephone and participating in local strategizing sessions concerning how to facilitate relocation among local, state (Alaskan) and federal (US) government agencies. In accordance with traditional ethnographic field methods, researchers also participated in the practices of daily life in Shishmaref. Against this backdrop, research questions were vetted with local participants to assure cross-cultural and linguistic accuracy. All interviews were conducted in English, and dialectical differences were taken into account through the vetting process.

Research questions ranged from asking participants about the aftermath of past flooding events (e.g. Can you describe to me what happened during the flood of 1997?) to asking about experiences in government planning meetings (e.g. Is Shishmaref being adequately represented to state and federal agencies?). In our survey, respondents were asked to indicate the extent to which they agreed with a set of attitude statements on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Through these various methods we hoped to gauge the level of perceived threat to local residents and to gauge the level of success government planning and disaster prevention has had, according to local perspectives. We were also interested in placing contemporary state and federal government-Iñupiat interactions within a longer socio-historical context. The following paper is a reflection of this research.

Interview data was transcribed and analyzed to identify recurrent themes of experience. Survey information was analyzed and compared to ethnographic and semi-structured interview data. Emerging from these variable methods is a coherent picture of Shishmaref residents repeated and continued engagement with government institutions to varying degrees of success and varying degrees of frustration.

## 4. Background

Climate change in the Arctic is having profound effects. From 1954 to 2003, the mean annual atmospheric surface temperature in Alaska and Siberia has risen between 2 and 3 °C (ACIA, 2005: 992). Along with warming, studies have shown that many parts of the Arctic have experienced greater levels of precipitation, increased intensity of storm activity (Hinzman et al., 2005), increased windiness (Huntington, 2000), increased flooding and increased erosion (USGAO, 2003, 2009), all linked (directly and/or indirectly) to climate change.

To date, most of Alaska's 200 Native villages are threatened to some degree by erosion and flooding. Thirty-one of these villages have been identified by federal, state, and local authorities as being in significant danger due to climate change-induced erosion and flooding (USGAO, 2009). Nine village, including Shishmaref, are considered under immanent threat (USGAO, 2009).

Shishmaref, Alaska has a population of 609 people, potential environmental migrants, and sits on a barrier sand island between the Chukchi Sea and a small lagoon. Acutely rural, Shishmaref lacks any roads and is highly dependent on air transport for both goods and travel in and out of the village. As flooding events increase, Shishmaref residents face two distinct possibilities. They must either successfully petition government agencies and/or private donors to fund the rebuilding of essential infrastructure including an airstrip, a barge landing, and a school on nearby, tribally owned land on the mainland, or they will eventually be forced into diaspora, away from traditional homelands before, during, or after a major disaster.

A third option of relocating to nearby, tribally owned land without government aid and/or intervention is unlikely for two reasons. First, the coast of building infrastructure in the US Arctic is prohibitively expensive for the small population of residents to fund themselves (see discussion of costs below). Second, migration to an area without basic infrastructure is unlikely because of dependence on electricity, gas, motorized vehicles, and other non-local products that mark contemporary life and have since the colonization of western Alaska (Berardi, 1999; Case and Voluck, 2002:8–9 and 187–188).

People from Shishmaref, the *Kigiqitamiut*, have inhabited the coastal and river drainage areas around the island for thousands of years, developing a rich tradition and a particular expertise for living in this location. Historically the *Kigiqitamiut*'s food harvesting techniques and adaptation strategies for climate variability and extreme weather events have been highly successful in this Arctic landscape (Burch, 1988, 2006; Koutsky, 1981). Bearded seal, spotted seal, caribou, walrus, musk ox, fish (of all sorts), berries, and greens are hunted, fished, and/or gathered throughout the year (Sobelman, 1985; Wisniewski, 2005). As Fred Eningowuk said in an interview, "It's like Shishmaref is in the middle of a circle of subsistence" (September 23, 2009).

Today the island also acts as the center of a complex food distribution system. The *Kigiqitamiut*'s and their visitors' subsistence practices provide Iñupiaq residents in other villages, in the regional center of Nome, in Anchorage, Alaska and beyond with dry meat, seal oil, and other traditional foods (for further discussion on food distribution and sharing in Alaska, see Fogel-Chance, 1993 and Fienup-Riordan et al., 2000). The island's 'centrality' in the circle of subsistence, is very much a cornerstone for Iñupiaq traditions, foods, livelihood, and culture. The island's existence is significant both to residents and to far reaching networks of people who share in identity and practice through food that is widely distributed and praised. Unofficially, Shishmaref is known to many as the 'dry meat capitol' of the world.

### 4.1. Findings: historical construction of vulnerability

Before the turn of the century, high mobility was a successful adaptation strategy for the challenging and fluctuating sub-Arctic environment, and was traditionally a first response to various environmental pressures. Decreases in the ease of mobility coincided with government strategies for promoting sedentarization throughout Alaska and were explicitly linked to the project of 'civilizing' indigenous communities and promoting the project of the state (Ducker, 1996; Scott, 1998; Berardi, 1999). Infrastructure

development was strong impetus for the consolidation of mobile family groups to sedentary villages (Schweitzer et al., forthcoming) and federal development began in earnest with the construction of a post office in 1901, a government school by 1906, and a Lutheran Mission by 1929 (Koutsky, 1981). Particularly 'persuasive' was school infrastructure and policy requirements that required children to be in schools (Ray, 1975; Berardi, 1999; Ducker, 1996). Throughout the last 100 years, the previously mobile *Kigiqitamiut* have become intimately tied to this infrastructure for school, work, life, and livelihood. Development and sedentarization policies rapidly decreased the ease of mobility for the *Kigiqitamiut*. Lives and work became rooted in specific, new, critical infrastructure. Thus, traditional adaptation strategies became less practical.

Prior to settlement in the village, the *Kigiqitamiut* people were sedentary seasonal, spending summers inland and winters and springs along the coast (Burch, 1988, 2006; Koutsky, 1981; Berardi, 1999). Barrier islands, such as Sarichef Island, were traditionally used as winter settlements and spring hunting areas, but remained uninhabited during the fall. This may have been due to fall storms that made the islands vulnerable to flooding. During interviews in Shishmaref, residents say – to the best of their knowledge – no traditional flooding stories exist prior to the floods that occurred in the village beginning in the mid-20th century. They also point out that their ancestors knew the island would eventually 'wash away'. Contemporary vulnerability to increased erosion and flooding is therefore linked to historical development decisions made in the absence of local representation. There is some speculation among residents that if the *Kigiqitamiut* had had input into early development decisions, a more sustainable location for infrastructure would have been chosen.

The millions of dollars worth of infrastructure and development that have been built in Shishmaref over the last 50 years now need millions of dollars worth of protection from changing ecological conditions. These buildings and roads, the airstrip and water facility eventually needs to be reconstructed or relocated in a more suitable location. The money needed to relocate critical infrastructure to a new location is astronomical for small, rural communities. In essence, this relocates power and decision-making over critical infrastructure out of local communities.

Thus, the colonial legacy of Shishmaref contributes to vulnerability in three major ways. First, development decisions made without local representation have resulted in infrastructure construction in already marginal and increasingly exposed locations (Oliver-Smith, 1996; Marino, 2009). Already flood prone areas are now even more susceptible to flooding and disaster because of increased erosion and climatic changes, making village sites throughout Alaska highly volatile under global climate change scenarios. Second, colonization and sedentarizaion ended high mobility as an adaptation strategy to climate variability and extreme weather without replacing it with other readily identifiable adaptation strategies for rural communities. There is no clear course of action in response to the threat of habitual, potentially catastrophic flooding today. In the past, movement was always an option. Third, following colonization, the seat of power over infrastructure became located outside of the local community. This makes local residents highly vulnerable to the economic and political fluctuations of the state. It is generally acknowledged in Shishmaref that funding opportunities for relocation have diminished since the global economic crisis began in 2008.

Infrastructure development is obviously not necessarily maladaptive; and critical infrastructure likely reduces vulnerability to other hazards. However, in Shishmaref, the colonial history and inequities inherent in colonizing decisions contributes heavily to current vulnerabilities to flooding, in the ways we observe here, among others.

### 4.2. Findings: funding and government capacity

Because infrastructure relocation and/or reconstruction is the major factor in relocating the community today, Alaska state and US federal agencies have intervened to prevent an immediate disaster and to organize the relocation of critical infrastructure. There have been multiple obstacles to this effort. One is cost. Infrastructure development in the Arctic is extremely expensive because of remoteness, lack of transportation infrastructure, and modifications of buildings due to weather conditions and ground fluctuations (Saboundjian, 2008). The estimated cost of relocating the village of Shishmaref to the community's preferred site is $180 million USD. There are, to date, three villages that must be relocated in the foreseeable future. The total estimated cost for relocating these three villages is $500 million USD (USGAO, 2009). This money is currently not available through government budgets and channels.

A second obstacle is organizational capacity and congressional mandates for disaster response, which may be an even greater problem than actual dollar figures. After a disaster the US Federal Emergency Management Agency (FEMA) acts as an umbrella organization and has the power to coordinate disparate agencies and infrastructure projects simultaneously. FEMA is governed by The Stafford Act of 1988, which, among other procedural amendments, outlines the goals of disaster recovery as promoting "recovery through rebuilding" (Sec. 504 [a]9D). The Stafford Act sets rebuilding *in place* as an explicit goal of disaster response (Stafford Act 1988 amended 2007; Bronen, 2011), which is illogical in places like Shishmaref, which are becoming uninhabitable due to increased exposure to flooding. Further, the Stafford Act requires rebuilding without improvement, even in instances where infrastructure is old, deteriorating, or without modern facilities such as running water.

There is no corresponding agency for preemptive disaster planning or risk reduction in these cases where erosion increases exposure to flooding hazards. Relocation planners, researchers, and *Kigiqitamiut* advocates all recognize the organizational nightmare trying to coordinating multiple governmental agencies and their annual budgets to plan an organized, timely relocation (IAWG, 2008; Bronen, 2009, 2011; AFN, 2009; Atkinson et al., 2009). Furthermore, FEMA's goal to rebuild in place, without upgrades to infrastructure, is fundamentally flawed with regard to disasters linked to climate change.

The Alaskan case studies explicitly highlight that established disaster response protocol through government agencies can be antithetical to climate change adaptation and preparation.

### 4.3. 5.3: Findings: access to government adaptation and relocation planning

The picture that emerges in Shishmaref is one of a long series of government interactions with local residents around development issues that led to vulnerability and are now incapable of creating policy, bureaucratic coordination, and funding to relocate residents away from vulnerable locations. State and federal agencies are working together to prevent disasters and at least 11 million dollars in government funding has been allocated over the last 5 years in Shishmaref for sea wall protection (IAWG, 2009); but relocating the population in an organized fashion seems unlikely in the near future.

Our results indicate that survey respondents were not optimistic that government intervention would prevent a major disaster. Respondents were asked to indicate the extent to which they agreed with the following 3 attitude statements on a scale ranging from 1 (strongly disagree) to 5 (strongly agree): (1) "I feel confident that Shishmaref will be relocated in a timely manner

before a major disaster occurs"; (2) "It is clear to me which government agencies would fund relocation"; (3) "Global warming, or climate change, is the greatest threat to Shishmaref's future."

Results indicated that survey respondents strongly agreed that "climate change is the greatest threat to Shishmaref's future" (M = 4.60, SD = .88). Despite high unemployment, inadequate housing, and a host of other economic difficulties (IAWG, 2009), climate change was forefront in people's minds as a pervasive and ever-present danger. On average, those surveyed tended to clearly disagree that "Shishmaref will be relocated in a timely manner before a major disaster occurs" (M = 2.05, SD = .94). Individuals who were not confident that Shishmaref would be relocated in a timely manner tended to believe that global warming was the greatest threat to the village, $r(28) = -.42$, $p = .03$, and were clear about which government agencies would hypothetically fund relocation, $r(28) = -.47$, $p = .02$.

Survey respondents who reported to understand which government agencies were working towards funding relocation were more likely to believe that a disaster would occur before relocation could take place. In other words, awareness of bureaucratic processes predicted low confidence in bureaucratic processes. Fundamental distrust in government-driven adaptation and relocation planning is highly problematic for moving forward in Shishmaref, yet this is a problem likely present in many climate change adaptation contexts, particularly in locations with colonial histories.

Interview data corroborates and expounds upon these findings. Government intervention to prevent disaster and plan relocation as an adaptation strategy has caused significant stress and frustration. "It's what's giving me grey hairs" (K. Ningeulook, personal communication, 2010). The following table presents a sample of common responses during interviews. Results show that global climate change is a pressing worry for residents; that there is significant distrust in government sponsored adaptation through relocation planning; and that the community feels misunderstood by government workers (Table 1).

Shishmaref is culturally and environmentally (including the built and natural environment) distinct from most of urban Alaska. There is a pervasive attitude in Shishmaref that urban dwelling, mostly white, government officials cannot understand the severity of the problem on the island because they have not been to the island, or understand the way of life on the island. Over and over in interview data (see table above) people insist, "they [policy makers] should come here and see for themselves" (R. Stasenko, personal communication, 2008). Respondents and interviewees express fears of evacuation in the event of a major flood that will lead to a permanent diaspora. "We're just scared if we relocate we're going to have to move to different towns. Might not live with each other anymore" (anonymous, personal communication, 2010).

A consistent theme during conversations with local Shishmaref relocation activists is that the village of Shishmaref has inherent value and that keeping the community in tact and on traditional land is 'worth it'. The banner of the Shishmaref Erosion and Relocation Coalition's website reads: "Shishmaref, we are worth saving" (http://www.shishmarefrelocation.com/). Residents, however, are profoundly distrustful of the governance structures in place to plan relocation and residents feel consistently misunderstood.

If it is possible to share the burden of climate change outcomes, then vulnerable populations must have a voice within the institutional structures that fund climate change adaptation. The Shishmaref case study demonstrates that traditionally marginalized populations, whose very marginality contributes to vulnerability, will likely continue to be marginalized from adaptation decision-making and continue to distrust governance structures that are already in place.

## 5. Conclusion

The evolving fascination with environmental migration by scientists and the public reached a high frenzy in the last 10 years, fueled by images of indigenous people and peoples from the Global South facing mounting disasters. These images carried the implication that increasingly degrading environments would lead to new migration flows and waves of vulnerable populations flooding into developed countries. As these images have not come to fruition as expected, the public has lost some interest in environmental migration as a critical outcome of climate change.

There is no doubt that migration decisions are complex and are linked to multiple vulnerabilities, of which changing ecological conditions are only one. Environmental migration, however, remains an important challenge to climate change scientists and policy makers. We know that forced migration linked to other social and political phenomena is correlated with a host of negative

**Table 1**
Interview excerpts regarding climate threats and intervention.

| | |
|---|---|
| Global warming is the largest threat to the Shishmaref community | "It's [the island is] going to go away until there's nothing. It is global warming and it is mother nature that we can't help. (2009).<br>"It feels like we're sitting on a big tub, like it's going to fill up with water. That's how it feels being on this island" (2010).<br>"Biggest change is that climate change is playing such a big effect in our community, not only that the ice is thinner. The water's too close for hunting with snow machines" (2010) |
| Disaster will occur (and lead to diaspora) before relocation can be organized | I don't believe the political structure/process can do it (fund relocation). It is too slow. It's always in the planning stages, but there's no funding for it. One day we are going to be evacuated. (2009).<br>"To not act represents the annihilation of our community through dissemination" (Shishmaref erosion and relocation committee).<br>"Nothing's being done. Look, we're still here" (2010).<br>"Just scared if we relocate we're going to have to move to different towns" (2010)<br>"We'll be scattered like refuges" (2009).<br>"Most of the conversation that I hear around relocation, the people don't have a real positive feeling about it, not that they don't want to relocate, but that they don't think that there's a site that's viable" (2010). |
| Alienation and communication difficulties with bureaucratic agencies | "People say: we don't need to go to those meetings, they just go around and around. We won't move; we won't ever move" (2010).<br>"They've got to see it to believe it" (2010)<br>"It's been, same every time. It's like: how come you guys are here again, saying the same stuff. We already heard this last time, you know?" (2009).<br>"Let the federal agencies come here and experience a whole storm, not come for the day and leave. Let them be here two weeks, so they could see it for themselves, cause it always seems like they don't believe us." (2009). |

social outcomes (see references above). If we hope to share the burden of negative climate change outcomes and prevent continued injustices to mount on already vulnerable communities, we must understand how communities become pushed towards environmental migration and obstacles to successful relocations.

In Shishmaref, ecological thresholds are being met and cumulative flooding disasters are making permanent habitation of the island increasingly unsustainable. In response, state and federal agencies are attempting to intervene. Our research indicates that vulnerabilities to increased erosion and flooding disasters in Shishmaref are linked to historical inequities through a lack of representation in early development decisions, increasing dependence on outside decision-makers regarding infrastructure today, and the loss of traditional adaptation strategies.

Current relocation planning is stalled, in part, by inadequate state and federal funding for rural communities. More importantly, federal disaster mitigation and recovery mandates are ill equipped to handle climate change scenarios. There is no overarching agency with the organizational capacity to relocate communities preemptively, even when a major disaster is essentially unavoidable. In conjunction, disaster recovery under federal authority sets rebuilding in place as a priority. This is illogical under climate change scenarios that make some location increasingly exposed to hazards. Finally, our research indicates that already marginalized, underrepresented populations that are experiencing negative outcomes of climate change, feel misunderstood and are distrustful of governance structures set up to prevent disaster and plan an organized relocation.

These circumstances are not unrelated. The colonial history of Shishmaref would not necessarily be significant to the climate change discourse today, if there were not obvious ties to the present. The relationship between indigenous constituents and non-indigenous majorities of any nation are often complex and rife with difficulty, misunderstanding, and injustice. Following our results, we predict that marginalized, minority communities are more likely to live in already disaster prone areas. These are places where development is likely to be inappropriate to the landscape because of colonial decision-making; and these are the very places where ecological thresholds will be met under climate change scenarios. The complicated relationship that exists between these communities and the State further complicates adaptation planning. These communities are more likely to be ignored and face larger political challenges to justify money for relocation when moving is the only option. For indigenous communities in particular, this threatens not only life and home, but also cultural stability.

At the same time, in Shishmaref, local community advocates are participating in the international discourse of climate change (Marino and Ribot, 2012) and are using media focus to draw attention to their predicament. Inuit people throughout the circumpolar North are becoming highly organized around climate change issues through the Inuit Circumpolar Council (ICC) and are adding powerful voices to public arenas. Local residents in Shishmaref continue to engage in full, meaningful lives – even under the pervasive threat of flooding. Disaster and vulnerability in Shishmaref are only part of the ethnographic picture of life in the village. There are, as in all places, vibrant traditions, celebrations, and lives being lead. Scientists and policy makers are interested in Shishmaref as a case study of environmental migration and as a possible context in which federal intervention to climate change outcomes will set precedent. Residents of Shishmaref are engaged with scientists and policy makers because 'Shishmaref is worth saving'. For potential environmental migrants, the stakes are much higher.

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