Adapting to Climate Change in Unalakleet, Alaska

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Abstract

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Climate change is affecting western Alaskan communities in many negative ways: infrastructure damage, loss of safe water sources, loss of the subsistence way of life, more danger from hunting and fishing near uncertain ice, and possibly more infectious disease. Climate change threatens rural communities with more negative impacts than they have the capacity to absorb, and some may be forced to relocate. However, emergency plans for rural communities have not considered how climate changes or relocation will affect members of place-based cultures. This study attempts to fill that gap in knowledge. Using a snowball sampling approach, I conducted semistructured interviews with key informants in Unalakleet, AK. The results were interpreted using grounded theory analysis and in the context of theories of how identity in place-based cultures arises from the sense of place. Results were grounded with a second trip to

Unalakleet. My findings suggest that climate change and other environmental changes have large effects on residents of Unalakleet. However, some of these changes have more extreme cultural effects than expected and in some cases opposite effects to those predicted. This research suggests that local autonomy and guidance must be blended with state and federal efforts in order to respond appropriately to climate change in Unalakleet.

Contents

Prologue: Why Narrative Nonfiction? 1
An Introduction to Unalakleet 2
Methods 7
Site Selection 7
Data Gathering 8
Analysis 9
Results and Discussion 11
Narrative one: can climate change sever the link between a culture and its place? 11
Narrative two: does climate change hurt your culture by changing your environment? 16
Climate and sovereignty 23
Acknowledgments 24
References 25
Appendix A: Interview Guide 29

Prologue: Why Narrative Nonfiction?

The thesis that you are about to read is narrative nonfiction. There are several reasons I chose to present my research in narrative form. For one, narrative nonfiction is a tool for applying universal human themes to a data set; that is, storytelling makes it easier for readers to connect to people whose lives are different and yet relatable. This can help smooth out intercultural misunderstanding between you, me, and the people you will meet in this thesis.

According to Robert Boynton, the editor of *The New New Journalism*, "what [narrative nonfiction writers] share is a dedication to the craft of reporting, a conviction that by immersing themselves deeply into their subjects' lives, often for prolonged period of time, they can… bridge the gap between their subjective perspective and the reality they are observing, that they can render reality in a way that is both accurate and aesthetically pleasing"[1]. The search for both truth and a good story in a piece of writing led to a new narrative nonfiction reporting movement in the 1990s, what Boynton calls "New New Journalism".

The "New New journalists" are interested in finding the untold stories of marginalized subcultures. "[I am drawn to subjects] that seem socially significant and underreported… I try to find people and groups that have not been heard from," says Ted Conover[2]. Alex Kotlowitz says, "I'm drawn to… the sorts of people who reporters don't typically spend much time with"[3]. Narrative nonfiction can be used to show the importance of the supposedly marginal to the central, much as small Alaskan communities have an important relationship to the United States as a whole, and to the whole world. As one of the most greenhouse gas-producing countries in the world[4], the United States bears a responsibility for climate change that should extend to its own communities that are experiencing its negative effects.

As a tool to tell "untold stories" in an intimate, relatable way, the narrative nonfiction tradition complements the qualitative social science that forms the core of this thesis, a grounded theory approach to analysis of raw interview data. As the social scientist Henry Huntington puts it, "Arctic residents can certainly speak for themselves, but social scientists have a great deal to offer in this discussion, particularly from a comparative vantage point that can nicely complement the detailed but local understanding that a

[1] Robert S. Boynton. *The New New Journalism: Conversations with America's Best Nonfiction Writers on Their Craft*. New York: Vintage, 2005. Print.
[2] Boynton, 2005.
[3] Boynton, 2005.
[4] European Commission, Joint Research Centre (JRC)/PBL Netherlands Environmental Assessment Agency. Emission Database for Global Atmospheric Research (EDGAR), release version 4.2. http://edgar.jrc.ec.europe.eu, 2011

community has about itself."[5] Local knowledge, combined with social science and narrative nonfiction, can be a powerful climate science communication package.

The Inuit Tapiriit Kanatami, the Canadian national Inuit organization, says that one of the things they would like outside researchers to know is that research in northern communities often does not "return home" in a useable way[6]. Having this study written up in narrative form will improve its accessibility and usefulness, not just to the residents of Unalakleet, but to the greater public as well.

An Introduction to Unalakleet

"When you hear about climate change, it is not just about the ice and snow and polar bears. It is about communities. We have to bring the human face, the human dimension, to this issue."[7]

Sheila Watt-Cloutier, Inuit Activist

In Unalakleet, Donna Erickson's house sits on stilts. She sits in her cozy wood-paneled kitchen, sorting tundra cranberries on a metal cookie sheet. Outside the window, the sun shines on the seawall built around the south point of Unalakleet and the raised road like a reverse moat between the school gym and the beach. The stilts offer the Ericksons far more than a beautiful vantage point, as was proved last November during an extra-tropical cyclone that produced storm surges of 3-4 meters in Norton Sound.[8] During the surge, the stilts protected the Ericksons from the water that rushed over the beach and under the house. Down at the airstrip, where Donna works for Bering Air, the waves of Norton Sound came within an inch of the terminal doors.

This 725-person[9] coastal town is one of the most vulnerable places in Alaska. Erosion caused by a wicked synergy of climate changes is slowly grinding Unalakleet into the sea[10]. The Arctic is warming and changing significantly faster than the rest of the globe[11].

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[5] Henry Huntington. "Human Understanding and Understanding Humans in the Arctic System." (2002). *The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change*. Fairbanks: Arctic Research Consortium of the United States, 2002. xxv.

[6] Inuit Tapiriit Kanatami and Nunavut Research Institute. "Negotiating Research Relationships with Inuit Communities, A Guide for Researchers." 2007. Web. 25 June 2012. <http://www.itk.ca/sites/default/files/Negotitiating-Research-Relationships-Researchers-Guide.pdf>

[7] Sheila Watt-Cloutier. "Everything Is Connected: Environment, Economy, Foreign Policy, Sustainability, Human Rights and Leadership in the 21st Century." (Talk given at the University of Maine, Orono, Maine, 29 March 2011) Online at http://mainecampus.com/2011/03/30/the-cultural-toll-of-climate-change/.

[8] Kinsman, N.E.M., and DeRaps, M.R., 2012, Coastal hazard field investigations in response to the November 2011 Bering Sea storm, Norton Sound, Alaska: Report of Investigation RI 2012-2 v. 1.1, Alaska Division of Geological & Geophysical Surveys, Fairbanks, AK, USA.

[9] State of Alaska, 2011.

[10] GAO, *Alaska Native Villages: Most are Affected by Flooding and Erosion, but Few Qualify for Federal Assistance*, GAO-04-142 (Dec. 2003), 39.

[11] IPCC, 2007. Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Geneva. 655-656.

Alaskan permafrost, land that typically stayed hard and frozen year-round, has been melting partially due to temperature increases across the state.[12] Larger storms sweep higher seas over the softer, less resistant land[13]. Erosion scrapes the land away, leaving residents vulnerable to the unforgiving waves of the sea.[14]

Could this be a sign of the world's destiny if we don't stop emitting greenhouse gases? That question is the reason why I'm sitting in Donna's kitchen on a windswept September day, drinking her homemade cranberry juice.

A petite prop plane, the only year-round way to access the community, brought me from Nome to Unalakleet. From the air, Unalakleet sparkles on a 2.9 square mile spit of terra firma, at the mouth of the Unalakleet River, with a slough to the east and Norton Sound to the west. The water sparkles beautifully, reminding me that it nourishes this community even as it threatens their land.

Figure 1. Unalakleet as seen by air. Photo: Rachel Aronson.

Archaeologists have found house remnants in the Unalakleet region that are two thousand years old.[15] The Russian-American Company built a trading post in the town's current

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[12] Markon, C.J., Trainor, S.F., and Chapin, F.S., III, eds., 2012, The United States National Climate Assessment—Alaska Technical Regional Report: U.S. Geological Survey Circular 1379, 7.

[13] Ibid.

[14] Immediate Action Workgroup (IAWG). (2009). Recommendations to the Governor's Subcabinet on Climate Change. The State of Alaska.

[15] Alaska Fisheries Science Center. "Unalakleet." *Community Profiles for North Pacific Fisheries*. DRAFT. NOAA, 2013. 4.

location on the spit, which helped spur the growth of the town.[16] After the transfer of Alaska in 1867, the United States Bureau of Indian Affairs and Christian missionaries built schools and churches in Unalakleet, further cementing the community in place.[17] Today, many residents there are descended from multiple ethnic groups, Iñupiaq, Athabascan, Yup'ik, as well as Russian and later Caucasian migrants[18], and so Unalakleet has a multicultural identity unmatched by any other place in Alaska.

I spent six weeks there over the summer of 2012 and spring of 2013, sleeping in an apartment owned by the tribal council. I interviewed elders in the community hall, fisheries managers in their rooms above the post office, and amateur herbalists in their kitchens-cum-greenhouses. In these ordinary spaces, I sought personal stories of a changed world. I sat down on sofas among rifles, Xboxes, and elderly Chihuahuas, and listened. The stories of Unalakleet grabbed me like a grizzly grabbing a salmon and got its teeth deep into all my preconceived notions about how people experience climate change.

Across the entire state of Alaska, climate change has manifested in many ways, including: loss of, or changes to the characteristics of winter pack ice, rising sea levels, flooding, thawing permafrost, increased storm severity, greater frequency of storms, earlier growing seasons, increased forest fires and tree infestations, changed animal migration, animal disease, and invasive species. [19,20] The effects of these phenomena on communities include infrastructure damage, loss of safe water sources, loss of the subsistence way of life, sea ice changes, and possibly more infectious disease.[21] Traditional knowledge of the way that the environment behaves is how people travelling across dangerous zones, like sea ice, can survive.[22] In sea ice today, leads (open water areas) form unpredictably. Native whaling crews face real danger from leads when they go out on the sea ice to feed their community and continue ancient traditions.[23]

These changes were the driving force behind the creation of the Alaska Governor's Subcabinet on Climate Change. Former Governor Sarah Palin brought the subcabinet into being in 2007. The Subcabinet on Climate Change convened the Immediate Action Work Group in 2007 to identify communities in most dire need of support, and to integrate resources for aid across the local, state and federal levels. The Immediate Action Work Group identified a list of "six communities in peril": Kivalina, Koyukuk, Newtok,

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16 Degnan, Frances. *Under the Arctic Sun: The Life and Times of Frank and Ada Degnan.* Cottonwood Bark, 1999.

17 National Park Service. "Bureau of Indian Affairs Unalakleet School." *National Register of Historic Place*. USDOI. April 8, 2002. http://pdfhost.focus.nps.gov/docs/NRHP/Text/02000536.pdf

18 Steve Ivanoff, personal communication, August 2012.

19 State of Alaska. "Climate Change in Alaska." State of Alaska, 2011. Web. 21 May 2012. <http://www.climatechange.alaska.gov/cc-ak.htm>.

20 Huntington, 2002. xxii.

21 State of Alaska, 2011.

22 Inuit Circumpolar Council, *The Sea Ice is Our Highway* (2008).

23 C.P. Wohlforth, *The Whale and the Supercomputer: On the Northern Front of Climate Change* (New York: North Point Press, 2006)

Shaktoolik, Shishmaref, and Unalakleet.[24] In the Immediate Action Workgroup's Recommendations to the Alaska Governor's Subcabinet on Climate Change,[25] the state began to develop individual plans for each village, assessing the relative benefits and costs of adaptation in place or moving the community.[26] At the time, Unalakleet was considered not to be in urgent need of relocation. The Immediate Action Work Group was quietly dismantled under the governorship of Sean Parnell and has not produced further reports since the Recommendations.[27]

Based on the Recommendations, I was initially planning to ask questions about erosion and relocation. Nowhere in my initial research proposal was there any mention of the history of colonization of Alaska. Was I naïve to have thought that people would care to talk more about the processes of climate change than all the ways that the government has changed the community since 1867?

Although the 2009 Recommendations dealt mainly with coastal erosion concerns, daily living in Unalakleet is threatened by climate change in other, unexpected ways that I learned about only by going there. If you live in Unalakleet, almost every day of the year is a good day to go outside and look for food, from seals to salmonberries.[28] While I was there, it was the hunting season for bull moose. A bull moose will provide enough meat to fill a motorboat and the bed of a truck.[29] Not only is subsistence culturally important, but it's also an economic imperative when grocery stores must be supplied by air or sea. With a limited cash economy, very few families could make enough money to stay fed and healthy though grocery store food alone. Not only is subsistence culturally important, but it's also an economic imperative when a bag of Doritos is $9 and a gallon of milk is $18. A 1994 study estimated that the replacement cost for locally harvested food in rural Western Alaska at 59% of the average Native Alaskan family's income.[30] Grocery store foods are much more processed than local wild foods, higher in fat and lower in nutritional value.[31] Individuals and the community gain not just physical but also spiritual health through the activities of collecting wild foods.[32]

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[24] IAWG, 2009.

[25] Immediate Action Workgroup (IAWG). (2009). Recommendations to the Governor's Subcabinet on Climate Change. The State of Alaska.

[26] IAWG, 2009.

[27] "Sarah Palin's Climate Change Cabinet Goes Dormant Under Alaska Governor Sean Parnell," February 6, 2013, http://www.huffingtonpost.com/2013/02/06/sarah-palin-climate-change_n_2630262.html

[28] Sheldon Katchatag, personal communication, August 2012.

[29] Steve Ivanoff, personal communication, August 2012.

[30] Grace Egeland, Lori Feyk and John Middaugh. "The Use of Traditional Foods in a Healthy Diet in Alaska: Risks in Perspective." Alaska Department of Health and Social Services, January 15, 1998. Page 10.

[31] Egeland, Feyk and Middaugh, 1998. Page 9.

[32] Johnson, Jennifer, Elizabeth D. Nobmann, Elvin Asay, & Anne P. Lanier. "Dietary intake of Alaska Native people in two regions and implications for health: the Alaska Native Dietary and Subsistence Food Assessment Project." *International Journal of Circumpolar Health* [Online], 68.2 (2009): n. pag. Web. 11 Jun. 2013

Climate change is a threat to the fish stocks that have been feeding Unalakleet for two thousand years and sustaining its people in a persistently difficult cash economy..[33] An especially vulnerable group of species is the anadromous fish, including all salmon species. Due to their life cycle, salmon can be affected by climate change both in their natal rivers and when they move beyond those rivers to the changing sea.[34] Salmon and other fish are of paramount importance to Norton Sound communities. Almost every household has a subsistence fishing permit for salmon[35]. Salmon-drying huts and smoke houses are in nearly every yard, and the average family puts up hundreds of fish every summer: dried, frozen, or canned in seal oil. Fishing is a million-dollar per year industry where the average yearly income is twenty thousand dollars.[36]

Figure 2. Salmon from the Unalakleet River. Photo: Rachel Aronson.

The story of salmon in Unalakleet illustrates why the Arctic is an ideal place to study the interaction between humans, the environment and climate change. Arctic place-based cultures have a connection with the environment that is guided by ecological factors, traditional knowledge, and regional, national and international policies.[37] As the Arctic environment experiences rapid change, Arctic cultures do too. Neither Arctic residents nor their environments are in a static condition. "As human societies change, willingly or otherwise, their relationship to the environment is inevitably affected. If the environment

[33] IPCC, 2007.
[34] Reist, J.D., F.J. Wrona, T.D. Prowse, J.B. Dempson, M. Power, G. Koeck, T.J. Carmichael, C.D. Sawatzky, H. Lehtonen and R.F. Tallman, 2006b: Effects of climate change and UV radiation on fisheries for arctic freshwater and anadromous species. Ambio, 35, 402-410.
[35] Alaska Fisheries Science Center, 2013.
[36] Alaska Fisheries Science Center, 2013. 5.
[37] Huntington, Henry. "Human Understanding and Understanding Humans in the Arctic System." *The Earth is Faster Now: Indigenous Observations of Arctic Environmental Change*. Fairbanks: Arctic Research Consortium of the United States, 2002. xxi-xxvii. Print.

is changing as well, we face an additional layer of complexity in trying to understand how Arctic communities will respond to and cope with this challenge and how they will function in the future," writes social scientist Henry Huntington.[38] In Unalakleet, culture, history, the environment, and many other factors are woven tightly together, and you can't tug on one thread without changing the whole fabric.

Someday soon, when the stilts and seawalls are no longer enough to keep back the roaring waters, the community will cease adapting in place and be forced to a new home, higher above the sea.[39] And yet, in the face of both environmental and political challenges, the residents of Unalakleet are determined that their way of life will survive. In the pages to come, I will share their stories of how climate change has changed their town and the ecosystem that envelops it. By framing their knowledge in the context of current government policies and global climate change, I will explore how climate-threatened coastal communities can protect and preserve their ecosystem-based traditions.

Methods

Site Selection

I focused this research on Unalakleet, in particular, for several reasons. Firstly, NOAA has done a study on vulnerability that places Unalakleet amongst the most vulnerable places in Alaska.[40] Secondly, Unalakleet made the Government Accountability Office's list of most climate-impacted communities in Alaska in 2007, and stayed on the list even after the State of Alaska Immediate Action Workgroup whittled it down in 2009.[41] Thirdly, Dr. Amber Himes-Cornell, whose work with the Alaska Fisheries Science Center focuses on vulnerability indicators, and Dr. Julie Raymond-Yakoubian, a social scientist who studies natural resources use in collaboration with Bering Strait communities at Kawerak, Inc., recommended Unalakleet as a potential study site. Most importantly, I proposed the project to the Native Village of Unalakleet Indian Reorganization Act (IRA) Council[42] in July of 2012 via then-General Manager, William "Middy" Johnson. The Council discussed my proposal in a meeting on July 24, 2012, and

[38] Huntington, 2002. xxii.

[39] State of Alaska, Department of Commerce, Community and Economic Development, "City of Unalakleet Foothills Subdivision Master Plan." February 1, 2011. Accessed June 10, 2013. http://commerce.alaska.gov/dnn/Portals/4/pub/Foothills_Sub_Master_Plan.pdf

[40] Himes-Cornell and Kasperski, in prep.

[41] IAWG, 2009.

[42] Most federally recognized tribes, including Unalakleet, are organized under the Indian Reorganization Act (IRA) of 1934 (25 U.S.C. 461 et seq.) which means that they adopted a set of formal documents for internal government. This created the democratic tribal government in Unalakleet, which is formally referred to as the Native Village of Unalakleet Indian Reorganization Act Council, or the IRA Council or tribal council for short.

said that I was welcome to come to Unalakleet and that the IRA Council would assist me in settling temporarily among the locals.

Data Gathering

This study received a determination of exempt status from the Human Subjects Division (University of Washington, HSD study #43504), meaning that it presented no risk to participants, and followed the ethical code of the University of Washington. Following the privacy recommendations of the Human Subjects Division, I maintained all data for this project in a password-protected computer.

In August of 2012, I travelled to Nome, Alaska, where I spent several days conducting six unstructured interviews as background on the region and regional institutions such as Kawerak, the native non-profit corporation, and Norton Sound Economic Development Corporation, the region's Community Development Quota fisheries group. The six interviewees in Nome included representatives of Kawerak, NSEDC, the Nome Eskimo Community, the National Park Service, the National Weather Service and Alaska Sea Grant.

From Nome, I continued to Unalakleet. Over the course of one month in the community, I conducted thirteen semi-structured, recorded interviews as well as unstructured, unrecorded interviews with elders, planners, members of the IRA Council, former members of the IRA Council, interested citizens and teachers at the village school.

Historically, Unalakleet has been primarily a Native Alaskan community. In 2010, 77.3% of residents identified as American Indian or Alaska native, 15% as White, 6.4% as two or more races, and 2.3% as other races[43]. For the purpose of this study, I considered all residents of Unalakleet to be members of a common place-based culture, regardless of ethnicity or tribal enrollment. The validity of this choice is supported by the fact that many families in Unalakleet have both a Native and non-Native parent, and many non-Native residents participate in subsistence activities and help preserve and share environmental knowledge within the community.

I selected the initial participants for the semistructured interviews with a purposive sample: members of the IRA Council and staff of the Native Village of Unalakleet and Norton Sound Economic Development Corporation. My assumption was that people in these positions have access to the environmental decision-making process and would be well informed about environmental changes. My interviews later proved this to be an accurate assumption. I found further participants through snowball sampling, asking initial participants to guide me towards interviewees who were considered local experts on the environment, either professionally or through subsistence activities. Some potential interviewees were approached but declined to participate in the study. I formally interviewed five women and eight men in Unalakleet. Ten of my Unalakleet interviewees

[43] US Census, 2010.

were Native Alaskan and three were non-Native. All my interviewees identified themselves as having environmental knowledge of Unalakleet.

At each interview, I obtained and recorded verbal consent for inclusion in the study. I informed participants that the study offered no benefit besides a copy of their recorded interview and was of no risk to them. I let participants know that they could abstain from answering questions, end the interview or ask me to turn off the recorder at any time. I recorded all semi-structured interviews with a Canon Vixia HV40 video camera and a DM-50 directional microphone, and also took notes to supplement the recordings.

I held all the interviews for this study in-person in Unalakleet, in a variety of settings, including participants' homes, participants' workspaces, rooms in the IRA Council offices, and my residence. Only one participant met with me at a time, with one exception.[44] To the extent possible, I conducted the interviews in private spaces to allow interviewees to share information freely.

Several experts reviewed the interview guide and assisted me in refining it (Appendix A). These people included Dr. Lekelia Jenkins, whose social science work in fishing communities used similar techniques for the collection and analysis of interview data, and Dr. Amber Himes-Cornell, who is familiar with Unalakleet through her work on vulnerability and resilience in Alaskan communities. Julie Raymond-Yakoubian, a social scientist at the regional native non-profit organization, has done extensive collaborative research with the communities of the Bering Strait. Finally, William "Middy" Johnson, former mayor of Unalakleet and the general manager of the IRA Council at the time of my visit, also provided invaluable guidance. These interviews were semi-structured, meaning that the interview guide was used in a flexible way to allow participants to educate the researcher as to the most important topics, following Charmaz as discussed in Bernard and Ryan.[45] The questions allowed participants to reflect upon environmental changes, past life events, and a hypothesized future for themselves and their community. Participants were encouraged to share their personal understanding of the environment in the past and their experiences of its changes; to share their understanding of how others perceived and portrayed environmental changes in Unalakleet; and to share how the environmental effects of climate change impacted their daily life: their work, family, and positions within the community.

A professional transcriptionist transcribed ten interviews, and I transcribed the remainder. I reviewed all transcriptions against the original video to ensure fidelity to the original recording.

Analysis

I imported the transcribed interviews into a program called MaxQDA, created by VERBI GmbH. MaxQDA facilitates the analysis of qualitative data by allowing for the coding of concepts. I used a grounded theory approach to analyze the data. The grounded theory method is a rigorous, iterative process used for developing theories based in empirical

[44] The interviewee in this instance was joined by a member of their household.
[45] Bernard and Ryan, 2010.

data.[46] A social scientist using grounded theory analysis goes through a process of hypothesis testing, looking for data that disproves the null hypothesis. Grounded theory analysis involves an on-going process of inductive theory generation while coding data, memoing, and integrating and writing.[47] Gibbs describes grounded theory analysis as beginning with theoretical sampling, or gathering data in order to specifically test an emerging theory.[48]

The overall goal of coding is to break conversation into concepts, sort those concepts into categories, connect categories into larger themes, and finally discover a central concept that will be the core of the theory. I followed the coding stages recommended by Strauss and Corbin, beginning with open coding.[49] Open coding is a process of fragmenting the texts of the interviews into potentially useful concepts and naming those concepts. This was an inductive process, where I did not pre-designate codes but named them as the concepts emerged from the texts. I then did some axial coding, which is deliberate coding done to connect the codes into overarching categories. A memoing process, both in the field and at home, helped me clarify ideas and theories that were emerging from the coding. I coded interviews in batches of two to four at a time, in a random order, in order to generate theories and then test those theories on fresh interviews. Lastly, selective coding helped me specifically test theories and clarify emerging themes. Strauss and Corbin recommend that a state of saturation should be reached where no new substantive information is arising from analysis.[50] I did my best to reach a state of saturation with my data analysis.

I applied the grounded theory approach to my conclusions by iterated coding and also by returning to interviewees. I first presented preliminary data to the public, including one informant, at the Western Alaska Interdisciplinary Science Conference in Nome, March 22, 2012. Then I returned to Unalakleet. It was not possible to meet with all interviewees, particularly as the sewer infrastructure of the village was facing a crisis at this time and many residents were either involved in the repair process and offices were closed due to a lack of running water. However, I was able to meet with two interviewees in Unalakleet for a second time and ask them about my emerging thoughts. Finally, I held a community meeting in Unalakleet at the Frank A. Degnan School, attended by seven residents. I presented my preliminary data and then listened to participants at the meeting and recorded comments from them. The themes of their comments were incorporated into my data analysis, although I do not quote from them.

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[46] Ibid.
[47] Ibid.
[48] "Grounded Theory," https://www.youtube.com/playlist?list=PL8CB91CC62C1C2C7E.

[49] A. Strauss and J. Corbin, *Basics of Qualitative Research: Grounded Theory Procedures and Techniques. 2nd ed.* (Thousand Oaks, CA: Sage Publications, 1998)

[50] Strauss and Corbin, *Basics.*

Results and Discussion

Narrative one: can climate change sever the link between a culture and its place?

Destruction and displacement: these are the twin signs of a climate refugee, a person forced from their home by climate change.[51] Today, there are only small numbers of climate refugees, but millions of people live in coastal communities that may be threatened by climate change. Newtok, a coastal community of 350 on the Bering Sea, will be one of the first communities in Alaska to migrate en masse.[52] The relocation to their new site, Mertavik, was motivated by extreme erosion. Flooding and erosion from the Ninglick River has made continued life on their island impossible. Although Mertavik and Newtok are only 9 miles apart, Newtok's relocation could cost $130 million dollars, given that Newtok has neither a barge landing nor any roads out of the community.[53] Newtok, where the average income is $9,128[54], faces an economic hurdle to relocation. Preventing state and federal agencies from prematurely writing off their community commitments in the existing village is also a real concern.[55]

Complete abandonment of one's home for the unknown is a hard road to travel (a metaphor underscored by the fact that few communities in western Alaska are connected by road to any other village). The challenges of relocation are far from the only reason why people would reject the label of climate refugees. Robin Bronen, an Alaskan human rights attorney and National Science Foundation fellow, points out that there are no special designations or protections in the United States or internationally for people displaced by climate change.[56] The United States government carries a long history of forced relocation of native peoples. Though much of that history is several decades removed from the present, distrust persists in native communities. As one Unalakleet resident, an older man and a member of the IRA Council, says, "'No, I'm not going to let them do it. I'm not going to let them do it. I don't want my kids and grandkids to go through what they're trying to put us through. You take it back, you come back and you become a fighter." Because some people see climate-induced relocation in the continuum of ways in which outsiders have mistreated native communities in Alaska, they possess an unbending desire to fight for their homes.

Unalakleet, although included in the six most impacted communities in Alaska[57], isn't yet at Newtok's level of catastrophe. Like Newtok, Unalakleet is almost entirely surrounded by water. However, with sea level rise and threatening storm surge, floods are becoming

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[51] Colectif Argos, *Climate Refugees* (Cambridge, MA: MIT Press, 2010).
[52] State of Alaska, "Newtok Planning Group."
[53] State of Alaska, "Newtok Planning Group."
[54] Alaska Fisheries Science Center. "Newtok." *Community Profiles for North Pacific Fisheries*. DRAFT. NOAA, 2013. 6.
[55] State of Alaska, "Newtok Planning Group."
[56] Robin Bronen, "We must protect communities who face climate change displacement," *The Guardian*, April 17, 2009, accessed June 9, 2013, http://www.guardian.co.uk/global/2009/apr/17/alaska-migration-climate-change.
[57] (IAWG 2009)

more common and erosion is a concern, especially where the sea meets the mouth of the Unalakleet River at the south end of the town. Storm surge has been noted as a particular danger to human life in the community. Storm surges, borne from increasingly energetic storms and higher sea level rise, may become a greater threat as time goes on. Not only do rising waters threaten buildings, but also there is a danger of storm surge throwing logs upon the land and also cutting off the roadway to higher ground.[58]

The US Army Corps of Engineers (USACE) has poured over $28 million dollars worth of investment into the infrastructure of the town, armoring the beach with rocks and the south point with rocks and a gabion wall (a wire box filled with smaller rocks: essentially an artificial boulder).[59] However, people have mixed feelings about these infrastructural improvements, although they could be a potentially life-saving improvement to infrastructure. But armoring the shoreline has its problems, especially for a maritime community. "I'm worried about the rocks and things that they put in," explains a staff member of the NSEDC. In the shallow water of the river mouth, boats could lose expensive motors to rocks loosed from the seawall. "Are we gonna screw up our channel, the entire river?" he asks. Partial armoring can even speed the erosion of coastal areas that do not have a sea wall.[60]

Figure 3. Sea wall in Unalakleet. Photo: Rachel Aronson.

In contrast to the sea walls, Unalakleet's road illustrates how a simple infrastructure change can add resilience. In Western Alaska, roads are few and far between, yet Unalakleet has a road that leads over the slough to the hills behind town. The 15-mile

[58] IAWG, 2009.
[59] http://www.brookings.edu/~/media/Research/Files/Papers/2013/1/30%20arctic%20alaska%20bronen/30%20climate%20alaska%20bronen%20paper.pdf
[60] Cite

road was originally built for the White Alice site: an early-warning radar station built by the Air Force during the Cold War.[61] The structure was demolished in 1972, but carcinogens remain in the ground, a troubled legacy of the Cold War in the soil. The PCB-contaminated soil was partially removed in 2012, but work continues on the site during the summers.[62] The road gives the town easy access to hunting and foraging zones. The road allows the town to develop infrastructure that people would not want squeezed in among the main residential areas, such as a new "tank farm," a complex of fuel tanks about a mile out of town that holds fuel for the iced-in months when no new fuel deliveries can be made.[63] Likewise, the road has also enabled the creation of town dump, a gravel pit, and a new hilltop wind farm that provides about 35% of their electrical needs.[64] The road is a huge infrastructural boon to the community.

Figure 4. The hilltop wind farm with the low-lying slough and Norton Sound behind. Photo: Rachel Aronson.

The road allows Unalakleet to pursue a unique strategy for responding to climate change. In 2009, the Native Village of Unalakleet had a land sale, freeing uphill areas along the road for new home construction.[65] Some locals purchased lots in order to move to higher ground, but more people participated in the land sale due to the fact that there are no more empty lots in town for building new homes. Houses on top of the hills have access to the electrical grid but possess wells and septic tanks instead of being connected to the

[61] Degnan, *Under the Arctic Sun,* 235.
[62] Victoria Kotongan, personal communication, 2012.
[63] Western Alaska Community Development Association, 2010. 14.
[64] Western Alaska Community Development Association, 2010. 14.
[65] City of Unalakleet. "Foothills Subdivision Master Plan." 1 Feb, 2011. Web. http://commerce.alaska.gov/dnn/Portals/4/pub/Foothills_Sub_Master_Plan.pdf

sewer system. The immobile seawalls protect the old part of town to some degree, but the road allows the town to organically grow and adapt to the new environmental reality.

Yet the new sites are not idealized or desired by everybody. Especially as scrub trees mature atop the tundra, the hilltops are developing small forests, which inspire feelings of claustrophobia and a disturbing, unliked novelty for some. Town elders come to the community center every summer day to share lunch and socialize. Elders, who make up approximately 5.4 percent of residents,[66] are particularly respected in Unalakleet. They are seen as the holders of the community's traditional knowledge. One elder woman tells me, "We are a coastal people. We like being out in the open." Safety from wildlife is a concern, too, even for these tough older women who still ride their 4-wheelers with a rifle on the back. They warn me about unseen bears in the trees that grow on the hills, adding, "No one wants to be up in the trees, bears and wolves in your backyard." And even people who do like or are willing to move to the uphill area still have economic concerns. "I think just coming back and forth to school bringing kids. It costs a lot of gas going back and forth," says one airport employee. "That would be the worst thing." Even a 4-mile commute is expensive when gas is around $7 a gallon and can only be delivered to town in the ice-free summer months.

Figure 5. High-ground site of future homes. Photo: Rachel Aronson.

However, in an unplanned way, the gradual diversification of home locations has strengthened the community. Like a diverse stock portfolio that can weather market events, having some people live uphill makes the overall community more resilient. Paul "Bebucks" Ivanoff III, Community Benefits Director at NSEDC, lets out a light laugh when saying, "I'm fortunate enough that I built a house near the top of the hill where

[66] US Census, 2010.

there's seven or eight houses now. But yeah, any flood that we've had in the last ten years, I've had from 10 to 15 people sleeping in my house. Wise man built his house upon the rock!" This shows that newly constructed uphill homes can serve as temporary shelters for those who live within reach of the sea. Wes Jones affirms, "Yeah, last year's storm there were people who moved out on the hill. I mean, we had everything ready. We would have been in the car and been gone in ten minutes… that's how real it was." Having emergency shelter on the hill at someone else's house during storms means that people can continue to live in low-lying areas most of the time. This is far less expensive than moving the entire community.

Having friends in high places is not only useful during a flood, but also during other types of emergency. In March 2013, the water line that carries freshwater to town froze, cutting off the supply of potable water. Under normal circumstances, water comes to almost all houses through a local sewer system, which provides fresh water from an infiltration gallery (more or less a perforated pipe) at Powers Creek.[67] Houses in the higher areas are not part of the sewer system, but sit on wells and use septic tanks. People with wells on the higher ground helped supply their friends and family in town with emergency drinking water during the sewer crisis in March.[68] Again, having resources available from hillside homes meant that the community avoided a complete water crisis.

The close ties in the community mean that people up the hill aren't severed from the community. They are still part of Unalakleet, and able to assist the wider community in emergencies, like floods and the sewer system failure of 2013. For the State of Alaska and the US Army Corps of Engineers, Unalakleet might be an example that it is better to offer coastal communities a way to access higher ground for gradual relocation rather than intense shoreline armoring. Access to higher ground increases overall community resilience by diversifying resources and establishing safer geographic possibilities.

Yet, even as the aesthetics of Unalakleet change, with shoreline armoring, roads and new neighborhoods, almost all my interviewees were determined not to migrate out of the community. What explains and inspires the determination to hang on? This may be because of an inherent distrust of the government. Although state and federal funds are important to the community, distrust of the government runs high. As Sheldon Katchatag, a housing specialist with the IRA Council says, "I view the United States of America as like a thirty-mile drift net. You touch it and you're hung. You're caught. You are, you are dead meat." Total relocation, which would require committed state and federal involvement may feel like a risky partnership with government agencies that may not be invested enough to carry it through.

Despite these challenges, residents of Unalakleet still love their community. "All I can tell you," says Jim Tweto of Era Airlines, "is it's not easy living up here... Me, it's a great place to live, but you've got to be the sort of person who can make it out here, otherwise you just can't make it." Of the thirteen people I interviewed, seven had left town at some point for career, family, or educational reasons and then chose to return to Unalakleet.

[67] Alaska Fishery Science Center, 2013.
[68] (Ak Dispatch)

Only one of the thirteen said that he would be willing to move away. There could be a connection between the people who chose to return and the low rates of being willing to leave again. As Victoria "Sissy" Kotongan, the Environmental Officer for the IRA Council, states bluntly, "I mean there are people that chose to live out here. They could live in Anchorage and… they chose to live out here, because of the place and because of what it has to offer. And if you took that away and they had to move, a lot of people would be lost… I don't think they would be themselves anywhere else." A sizeable proportion of the adult population of the village has sampled the wider world and found that they are their truer selves in Unalakleet. Their bonds with Unalakleet supersede economic and environmental safety concerns. Climate change cannot destroy community bonds.

Maybe that's why people mention so often in interviews that they love the ocean, and living near it. When people make that deliberate choice to return, they are returning to the coastal island town they grew up in, not the uphill forest. Future generations of Unalakleet children might be nostalgic for today's innovations like the shoreline armoring and the raised roads, but it's harder for all the town's adults and elders to stomach change.

Climate change may change the physical nature of Unalakleet. But Unalakleet shows that if communities are able to access a strategy that allows for gradual relocation, relocation can be a process that moves at a rate that people can become accustomed to. Even the airport employee, who expressed concerns about a possible daily commute down from the hills, agrees. "Unalakleet is so unique... And I think moving up the hill, it won't change," she says. "I don't think it'll change." If relocation can take place at a speed that allows for people to accept the idea and embrace it, rather than a single enormous migration, the relocation can become part of the culture and not a destructive force. The nature of the land auction in Unalakleet also allowed for people to begin moving relative to their preferences to stay in the lower part of town or go higher. This mitigates the community's overall risks and avoids the expensive and risky last-minute total relocation process that Newtok has faced. Coastal communities, from Alaska to the Eastern Seaboard, should hold Unalakleet as an example that gradual retreat can prevent general catastrophe.

Narrative two: does climate change hurt your culture by changing your environment?

"Global warming and climate change touches on almost every aspect of an indigenous person's life. When viewed in the context of the cumulative impacts of all the other cultural, economic and environmental degradation that indigenous peoples face, climate change threatens our very survival as peoples." *Sheila Watt Cloutier, Inuit activist*

Unalakleet's largest building is the Frank A. Degnan School, which resembles many of the schoolhouses common across the Lower 48, if you ignore the taxidermy wolves and the scrimshaw walrus tusks. Another distinguishing feature of the school is Jolene Jones'

classroom. On the right, the blackboard is covered with Iñupiaq words. On the left are a kitchen and a row of sewing machines. Fur mittens made by students are displayed in a case for the whole school to admire.

The bilingual/bicultural classroom is part of the official curriculum of the Bering Strait School District. In the class, Jones and an assistant take students berry picking, hunting, teach them how to prepare seals and birds, and make traditional clothes and foods. Jolene sees her job as filling an important gap in kids' education. "Today when we're cutting fish, because they already told me yesterday, 'I've never caught a fish before.' And I'm like, 'Well, as long as you get the basics of how to do it, you know, you could be able to do it on your own.'"

Figure 6. The bicultural classroom in the school. Photo: Rachel Aronson.

This classroom is just one of the ways that residents of Unalakleet pass on cultural knowledge, a vital practice for any culture but more so for a rapidly changing society like Unalakleet. Lawrence Kaplan, of the Alaska Native Language Center, listed Unalakleet's original three languages: Malimiut Inupiaq, Qawiaraq Inupiaq, and Central Alaskan Yupik. "All are quite moribund in [Unalakleet], with just a couple of Inupiaq speakers remaining and probably no Yupik speakers there," he wrote to me.[69]

Climate change may be complementing other factors in the destruction of traditional ways of living. A few community members maintain dogsled teams, and Unalakleet is a stop on the world-renowned Iditarod. Beyond competitions, though, dogsleds are not a daily part of winter life for most locals due to the high feed costs and the large amount of time and effort needed to maintain a team. "At sixty-four I'm starting my last dog team,"

[69] Lawrence Kaplan, personal communication, August 2012.

says Sheldon Katchatag. “I grew up with dogs… none of my kids right now are interested in dogs. But I’m trying to at least hang on for my grandkids. If he’s interested, I’d like to make sure he has the opportunity. That’s another thing that most people don’t study is what impact does it have to [lose dogsledding]. We’re a functioning community that has a historical connection to dogs since time immemorial.” The slow slipping away of some traditions is the baseline condition that sets climate change up to be so destructive to local knowledge.

But despite what may have been lost, local knowledge, sometimes called traditional ecological knowledge (TEK) is still very much active and vibrant in Unalakleet. “What people actually know is closely connected to both historical and current land use and occupancy…such a broad observational base contributes to a unique reliability of local environmental monitoring, where change is often traced by and related through personal life histories and experiences,” write social scientists Igor Krupnik and Dyanna Jolly.[70]

Residents of Unalakleet are actively maintaining their connection to their environment in such a frenzy that I had a hard time getting interviews. Like a real Alaska novice, I managed to plan my trip right in the midst of the late-summer berry and bull moose seasons. Sheldon Katchatag illustrates that connection for me: “As I was growing up, my mom used to tell me, ‘As long as you’re not lazy, you can eat something new, something different, something fresh, every day of the year.’ And that, that is to me, it’s more the custom and tradition, it, it’s a continuum.” The landscape of Unalakleet rewards those who possess environmental knowledge with rich edible resources season, from fish, seal, caribou, moose, bear, and marine mammals[71] to birds and their eggs[72]. Edible plants and mushrooms are plentiful around the community as well.

Subsistence activities are not just nutritionally important but also hold great spiritual and cultural importance to Unalakleet. “Having a spiritual as well as a physical connection to the land is very much part of what we were taught growing up hunting and fishing,” says Paul “Bebucks” Ivanoff. “Our entire way of life would be lost [if we could not participate in subsistence harvests],” adds Donna Erickson. “Our way of living is our, it's our identity.” As the Intergovernmental Panel on Climate Change states, “In many indigenous communities, these subsistence food systems are the basis of traditions, socio-economic and cultural well-being. Indigenous peoples maintain a strong connection to the environment through traditional resource-harvesting activities in a way that distinguishes them from non-indigenous communities, and this may indeed contribute to how specific peoples retain a fundamental identification to a particular area.”[73]

As I had expected, the very environmentally informed people I met in Unalakleet had a large inventory of recent environmental changes that they wanted to share with me in interviews (see Table 1). Elders shared that there were new insects in town that they had never seen before. Hunters noted that the caribou no longer stopped outside of town, but

[70] Krupnik and Jolly p. 2
[71] Alaska Fisheries Science Center, 2013.
[72] Steve Ivanoff, personal communication, 2012.
[73] IPCC, 2007. 671.

spent the summer further north, closer to Nome. Among these and many other changes in edible resources, people also noted that the weather had become more extreme, with more very hot or very cold days, and much stronger storms. All interviewees said that they had seen environmental changes in their lifetimes.

Ecosystem component	Change
Weather	Not as consistent Stronger fall storms More extreme cold and heat Less snow More rain
Biodiversity	Invasive/unknown species Existing species changing ranges
Ocean ice	Physically unstable Unpredictable timing
Erosion	More erosion
Ocean	Higher and more frequent storm surge Faster currents
Plants	Fewer salmonberries Edible plants growing to unusual size
Tundra	Tree growth replacing tundra Permafrost melt
Fish	Decreased salmon runs
Animals	Bears coming into town Caribou moving away from town Sick seals Lynx appearing More insects

Table 1: Environmental changes in Unalakleet as expressed by interviewees

Does observation imply causation? Are all these changes really climate-change induced? The Arctic, like all ecosystems, has a baseline, or expected, level of change. "Change, large and small, frequent or infrequent, is simply a basic characteristic of the region, compounding the difficulty of identifying trends and causal relationships. Arctic residents have long known about, and had to cope with, this variability," writes the Alaskan social scientist Henry Huntington.[74]

Even for a small community, Unalakleet has a diverse set of reactions to environmental change. Not all my interviewees saw changes as being related to climate change, or had a conventional definition of what climate change is, or agreed how much to prioritize climate change over other concerns. One interviewee said, referring to political and economic disenfranchisement, "In my mind, I view too many other things that have effects on our community over the climate for making, making things harder for people,

[74] Huntington p xxiii

you know?" Another told me, "They drilled out the oil out of our soil then dug up the gold. So naturally, the earth gonna get unbalanced slightly. And that's what's causing all of the changes in the world weather-wise." In this regard, Unalakleet is not unlike the rest of the United States in disagreeing about some aspects of climate change and environmental change. However, the dominant theme, with twelve out of thirteen interviewees agreeing, was that there are indeed changes occurring in the environment of Unalakleet.

As you might expect from eight and a half hours of used videotape, my interviewees were not shy about sharing this environmental information with me. However, people also talked at length about how they shared this knowledge with each other. Unsurprisingly, the social science literature about northern communities has noted these knowledge networks. Smithsonian anthropologist Igor Krupnik and Dyanna Jolly, again: "Individual living memory is then extended through storytelling and information sharing. Such an exchange of oral traditions takes places daily in the family and community setting, and it expands the time-depth of personal expertise and observations."[75]

Figure 7. Salmon fishing in the fall. Photo: Rachel Aronson.

Knowledge sharing takes place in Unalakleet at different levels. Individuals in the community participate in exchanges of information with several different external organizations: by joining the Local Environmental Observer (LEO) program at the Alaska Native Tribal Health Consortium, communication with the Alaska Native Language Center, and enrolling in the University of Alaska-Fairbanks' ethnobotany classes in other Bering Strait communities. The LEO program is a particularly excellent knowledge network between local observers around Alaska. Two interviewees also spoke

[75] Krupnik and Jolly p 3

of the delight they took in relationships with college professors who had been substantially interested in Native culture. Key features of the external knowledge sharing relationships were that locals felt that someone beyond the town's borders was listening and valuing their thoughts and reactions, and that locals themselves gained knowledge (sometimes even tangible knowledge in the form of textbooks and Inupiaq dictionaries).

On the intracommunity level, participants had many formal and informal ways of sharing knowledge with other locals. Karen Nanouk was developing a herbarium of 27 different plant species, and hopes to give the information to the school. Donna Erickson volunteers to teach young girls in the community how to sew. Gary Eckenweiler started keeping a daily journal of hunting, fishing and weather without imagining how important it would become.

> "And at the time I didn't realize what I was doing, or that it would be that big a deal. But now people ask me all the time, 'Hey, when did the river go up? When's the average day?' I can look and calculate, it's May eleventh is average, you know, stuff like that… So it is pretty cool. Or like people are wondering this year - we had that real high flood from all the rain, which you probably were here during that - when the last flood was. I checked, it was ninety-four. No one could remember but like, 'I'll look it up.' And then like we had a real late spring, the ice didn't go away. The last time that happened was ninety-two. And I looked later in the year and I saw yeah, we had a real early winter too that year too. So and this is like ten degrees, past three weeks have been like ten degrees colder. Then the average highs have been ten degrees colder than the average highs. It's kind of fun. The journal's fun."

Not all community knowledge sharing was through individual initiatives. Donna Erickson described berry picking to me as she sorted cranberries in her kitchen, "It's a really enjoyable time, because women go out in groups, and it's really a social time, a fun time of gathering together - and keeping our relationships united like in a village way. It's very traditional." Sharing traditions are enmeshed with many subsistence activities in Unalakleet. Sitting in the IRA Council offices with me, Sheldon Katchatag agreed, saying, "that's what gets all of us up here through, that we have a strong community spirit."

The line between community and family can be a porous one, especially when, as Sheldon Katchatag puts it, "we are interrelated like you would not believe! I mean, I'm talking from here probably all the way to the Greenland, if we were to connect the dots – all the dots – each dot indicating a marriage or blood relation, if you connect all the dots, we'd go all the way." However, I specifically drew out what knowledge people had received and shared with their immediate relatives.

People spoke about knowledge gained from their parents' generation and passed on to their children as being both valuable as a learning and as an emotional experience. Paul "Bebucks" Ivanoff shared his experience of fishing with relatives, "going through a dense fog and asking my dad or my uncle, how do you know where we are? I mean, it's foggy, you can't see much farther than a boat length in front of you. They said, oh, you just read

the current. Know which tide is going in or coming out and read the current. That was pretty cool to be a part of growing up."

Figure 8. A father and son with a bull moose. Photo: Rachel Aronson.

However, several of my interviewees had concerns about the continuation of family knowledge sharing, not in their own families, but in the community at large. One woman, an avid hunter, told me, "You can definitely tell the kids that like to play videogames versus the kids that like to be outside." Another woman, a mother, said, "I notice that a lot of the families are not like my family who brings their kids everywhere that they go. A lot of the families are now not bringing their children out [on hunting trips]." While concerns about the next generation are universal through space and time, these quotes may also point to an unprecedented generational change that is occurring at the same time as unprecedented environmental changes.

As in all human communities, worries persist in Unalakleet about the transmission of knowledge in the face of mortality. When I returned to Unalakleet in March 2013, people talked about how there had been a spate of recent deaths of elders, the traditional repositories of knowledge. Even Jolene Jones, the cultural teacher, had concerns about the next generation of children. She says, "I think a lot of their grandparents know everything, you know. But it's like skipping their generation, because of the culture change." As elders pass on, knowledge goes with them.

The experience of a culture's body of knowledge changing over time, with the generations, may be universal. But in Unalakleet, a changing environment may be compounding that baseline level of knowledge change. When environmental conditions contradict inherited knowledge, the negative effects of cultural change could be exacerbated. For example, if the environmental knowledge of their grandparents is no longer as accurate because of environmental changes, today's youth may be less interested in going hunting and fishing because they cannot learn from their elders to the extent that their parents could.

For now, the community continues to experience changes and adapt to them. The strong net of knowledge sharing that exists in Unalakleet persists. But like an increasingly rough current, climate change is wearing out some of the threads.

Climate and sovereignty

Unalakleet continues to display great adaptability, pursuing a diverse set of climate responses. As discussed above, infrastructural threats will pose an ongoing concern, particularly given the high costs of construction in the area. But armoring the shoreline while simultaneously encouraging development to organically move uphill is a flexible strategy to adapt to the physical effects of climate change.

It is important to note that many of my interviewees regarded the state and federal governments through the legacy of adverse state and federal actions. The passage in 1971 of the Alaska Native Claims Settlement Act (ANCSA) (43 U.S.C. 1601) provided for the creation of regional and village corporations under state law to manage the money and lands granted to Alaska Natives by the IRA. ANCSA has brought economic support to the Norton Sound region through the Bering Straits Native Corporation, which in its turn supports a non-profit, Kawerak, which provides social services and supports local culture. Yet, ANCSA remains controversial for extinguishing native claims to most of the state of Alaska in exchange for lands and funds given to the new corporations. As one man says, "They've tried to put our people under the cash economy so that we become at the mercy of those that produce the cash. And they have not succeeded because they still allow us to 'subsist off our customary and traditional resources'." Subsistence, the living connection between locals and the land, is seen as the bulwark between the community and the government's incursion on their sovereignty.

Subsistence is the heart of Unalakleet, and climate-based threats to subsistence may in the long run represent a greater spiritual and cultural challenge to the community than relocation. However, current Alaskan and Federal policies regarding communities like Unalakleet are infrastructure-based, not subsistence-based. This underscores Huntington's point that "response strategies that do not reflect the values, priorities, and needs of society will fail, either because they are not acted on or because they destroy the very thing they were supposed to help protect."[76] Residents of Unalakleet do not trust the state and federal governments to appreciate and protect subsistence activities. Says one local, "they think it just essentially means living off the land, but it's more than that. It's taking care of the land, and it's putting back into the land what you take for it." Building awareness of subsistence into policy could create a response strategy that preserves the place-culture connection and also helps build trust between the local, state and federal levels of government.

Unalakleet offers us a vision of interconnectedness, both within a community and to the environment. As one man says, "a lot of times it's portrayed that we're vulnerable and that we need help and you know that's always the cry that you hear from the media. And when in actuality if you go and experiences even just four weeks out of the whole life of an Alaska Native or indigenous population, wherever it may be, whether it's Africa, South America, Pacific Islanders, you'll find a tremendous amount of adaptability and ingenuity, what it took to survive." Unalakleet is, in many respects, in the vanguard of the

[76] Huntington p xxv

human experience with climate change. The struggles of the town, to an even greater extent than in recent history, offer both examples and warnings to the world beyond. Their answers can guide climate policy, in Alaska, the United States, and around the world.

Conclusion

The infrastructural effects of climate change are not the primary concern of residents of Unalakleet, because adaptation is already underway. Through a mixed strategy of seawalls, road-raising, alternative energy development and partial relocation to higher ground, the community is becoming more resilient to seal level rise, storm surge and erosion.

However, changes in the ecosystem that affect subsistence are having a large negative effect on the community and are not as easily addressed with concrete actions as infrastructure effects. Furthermore, a changing environment that contradicts inherited knowledge could increase the negative effects of cultural change.

Current Alaskan and federal policies regarding communities like Unalakleet are infrastructure-based, not subsistence-based. Building appreciation for subsistence into policy could create a response strategy that preserves the unique connection between place and culture.

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Appendix A: Interview Guide

This is a general interview script that will be used to facilitate discussions about individual residents' thoughts and feelings about climate change and its effects on culture, community and sense of place.

Name

1. Age
2. Identify as Native Alaskan?
3. Born in Unalakleet? How many years lived here?
4. Have you noticed environmental changes in Unalakleet over your life or time here?
    a. (What kinds, where)
5. In what ways has environmental change changed how you feel about Unalakleet's future?
6. What negative changes in your life have come from environmental changes?
7. What positive changes in your life have come from environmental change?
8. Would you like to leave Unalakleet because of these changes?
9. Would you like to move uphill?
10. Do you have the ability to move in response to these changes?
11. If you relocated, what do you think would be better about your life?
12. If you relocated, what do you think would be worse about your life?
13. Do you have any ways that you manage these changes in your life?
14. Besides your own actions, what groups or people help you manage the ways that environmental change changes your life? How are they helpful?
15. Tell me how your thoughts about climate change have changed over time.
16. Is there anything that you think is important that I didn't ask about?
17. Is there someone else you know who I should talk to about these issues?