Permafrost Symposium Reflection

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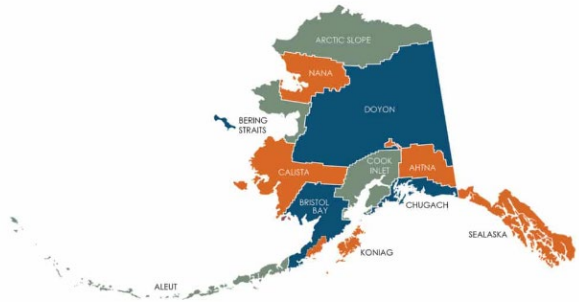
The Problem

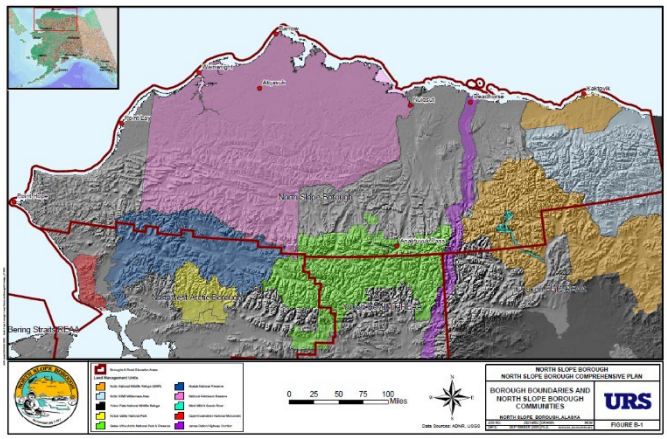
Our Alaska is the front line of climate change, experiencing the resulting impacts of that change on a level unimaginable for those that do not live with the ice. Our lives are built on the porous, striated, patchy ice that defines the far North around the globe, establishing kinship in our community of resilience. Our entire world is melting into a new reality. **The quickening of climate change has begun.** That is what we hear, that is what we see, that is what we know. The changes are visible, audible, and measurable.

The Dichotomy

There is a lot of money in the North Slope Borough that could be used for equitable climate adaptation solutions, and in its geographic parallels, the Arctic Slope Native Association (ASNA)/Arctic Slope Regional Corporation (ASRC) region. Four of the eight Alaskan Native communities located within the borough are also co-located within the boundary of the National Petroleum Reserve in Alaska (NPRA), one of the most politically and economically active regions of Alaska. The borough and native corporation receive royalties from oil and gas development on the North Slope of Alaska. The impressive resources available per capita in the region as a direct result of fossil fuel production, the resulting royalties, and ultimately its consumption, are unique to the North Slope of Alaska. Thus, when witnessing the dramatic impact of climate change on homes, infrastructure, and subsistence activities in this region of Alaska, fueled by precisely the fuel of the nation and the world being extracted from the region, the hypocrisy of Alaska governance in on full display. The financial income is clearly more important to the State of Alaska than the impacts of fossil fuel production and consumption to the communities and citizens of the North Slope.

Whether centralized in Utqiagvik or distributed throughout the eight Alaskan Native communities of the borough (nine tribes), the **disparity of regional infrastructure resources in**





Alaska, between this region in comparison to the other 10 of 12 Alaska Native Claims Settlement Act (ANCSA) regions, is stark.

Left: https://ancsaregional.com/the-twelve-regions/; Right: https://www.north-slope.org/wp-content/uploads/2022/02/Figure_B-1_-_Borough_Boundaries_200dpi_normal.pdf

ASNA is the tribal nonprofit health and social services organization designed to equitably serve the Alaskan Native people of the Arctic Slope Region. This agency supports the distribution of BIA funds to individual tribes through several mechanisms including infrastructure support of housing, water, electricity, human health, workforce development, and others. The provision of infrastructure services is challenged by the short shipping/receiving season for items that cannot be shipped on a plane, and the limited amounts of skilled workers in the area to perform the construction and maintenance of the infrastructure, as well as the mandate to be equitable over time and geographies. The result is the implementation of "traditional" western and outdated solutions to current critical infrastructure problems in the remote communities of the North Slope that are "equitable" in the language of the BIA. These housing and building solutions are the same as those that have been implemented in other communities throughout the North Slope of Alaska over the past 40 years, regardless of climate change impacts and lack of equitability to other American communities. The evidence indicates that in northern Alaska, the definition of "equitable" is the installation of forty-year-old technology to solve problems that Arctic citizens have been managing for thousands of years. If these technologies are an improvement to traditional methods, and these technologies create equitable infrastructure, what does forward leaning look like?

It is not surprising to learn that the **Arctic infrastructure solutions of forty years ago do not embody the energy efficiencies that non-Arctic societies are embracing today**. These outdated Arctic solutions were generally adequate when the climate was stable and cold and playing its role as constant. However, the variability and consistently changing climate of the past several years, and every single year yet to come, has deemed these technologies moot.

There are several prototypical housing solutions being tested in NSB communities that focus on permafrost-safe foundation concepts, using the same electrical and water infrastructure solutions from 40 years ago. The workforce to build and maintain these prototypical solutions tends to be a transient band of construction engineers with a lack of understanding of permafrost management principles, that effectively exacerbate permafrost degradation due to a lack of knowledgebase. Though there are several infrastructure focused pilot projects across Alaska and prototypical housing projects underway along the North Slope, to what end besides demonstration is unclear. If the technology is proven functional in the current state of Alaska's environment, it is not likely to be relevant during the next stages of climate change we are glimpsing in Alaska's Arctic.

Whose responsibility is it to investigate, propose, and ultimately implement, cutting edge technologies designed for a changing Arctic? The village? The borough? ANSA? The individuals themselves? The Federal government? This illusive answer may be our communal downfall.

The Politics

The politics of the region created by the economic advantages of fossil fuel production make it clear why there are not significant climate adaptation measures in place on the community level in this region, but that does not mean they are not in active use by Big Oil. The impacts of climate change on the oil-bearing infrastructure of the North Slope are actively managed by teams of engineers daily. Buckling pipelines, temperature-dependent processes, housing, and transportation challenges as a direct result of a warming climate are being worked around every day. The system on which the entirety of the North Slope oil production was founded is collapsing. Big Oil knows it, but they have the knowledgebase and money to work around the impacts, but these solutions are not being communicated or applied outside of the industrial complex of Alaska.

We know our ways of adapting to our Alaskan environment don't work anymore, and that they will become increasingly off target. If the richest region in Alaska is failing to use the available resources to adapt to the direct impacts of climate change, how can the poorest region in Alaska access resource-driven solution sets? It is not for a want of information that caused us to fail at mitigating the early effects of climate change in the Arctic. It was fear of the established lexicon, lifestyle, and our own neighbors ostracizing us into silence and hunger. Now everyone is loud and starving. Everyone in town is ready to *lean in*, but we continue to stop short of the long-term solution sets. We're so tired. Tired of shouting that we are different, tired of trying to gain attention to our issues our own state politicians will not acknowledge. Tired of fighting words when physical reality reveals our vulnerabilities and our three minutes of free time we are not employing to serve our neighbors

With this knowledge we continue to duct tape our solutions into action and offer roles of the sticky stuff to our neighbors. It is all we can do as Alaskans governed by a state government that will not acknowledge that our oil-based economy is our own downfall. With decadal timelines shorter than timeframes for equitable installation of critical infrastructure for communities on permafrost, kinship through crisis will be what saves us from ourselves.

A Proposed Solution Set

By **performing regular, consistent, applicable synthesis of information about permafrost dynamics in support of the stewardship of our Alaska we have a chance of sustaining our lifestyle, neighbors and communities through extreme change, climate and otherwise**. To do anything else would jeopardize the achievement of that goal. Right now, Alaskans rely on ad hoc information, hearsay, and local anecdotes. These are not the data points that change policy. Qualitative and quantitative collections of data on these changes can be the data points that are used to change policy, and we can do this.

Scientists are effective at establishing current conditions using observational tools, but to effectively support Alaskans through climate change they will need to employ the new skill of listening to Alaskans about observed change to understand current community needs and translate their work into everyday value. To increase that value, developing community partnerships and training community scientists to collect and synthesize observational data on climate change impacts will allow for direct accounting of change that can be politically

leveraged by communities with funding agencies to acquire the resources necessary to adapt these far Northern communities to climate change, without the reliance on outside scientists or perceived experts. Of the westernized observational techniques and targets that can be synthesized to inform policy, climate models, and community buy-in, we recommend:

- Directly measuring permafrost locations, temperatures, and unique characteristics,
- Collecting aerial images of land surface and elevation,
- Measuring river flow, silting, chemistry,
- Instrumenting new building foundations (non-structural),
- Establishing regular infrastructure inspection routines.

By collectively monitoring these geophysical variables Alaskans will be able to identify tipping points and additional quickening of climate change. Trained and supported, citizens, and in turn their communities, can be empowered by communicating Siren Data (i.e. red flag data) to gain additional resources for adaptation. Specifically, identification of acute change, the long-term impacts of acute change, and the impacts of those changes on Arctic realities must be voiced beyond the local and regional level to gain resource support on the scale that would actually impact change for these Alaskan communities.

Critical to our Alaskan solution set is building the capacity of our Alaskan neighbors to synthesize the relevant information about our changing climate into informed decisions. To create this capacity, we need to develop and invest in knowledge partnerships among researchers, communities, and agencies. The aim of these partnerships and networks will be to develop western scientific and financial capacity for long-term monitoring with equitable researcher compensation, while simultaneously strengthening the local workforce to monitor change and the implementation of climate mitigation solutions.

Though Arctic communities are well-funded to embark on adaptation journeys and many are thriving across the circumpolar North, this is not the case in Alaska. We must move past the cycle of institutionalized inequitable infrastructure in Alaska AND implement functional solutions to create thriving Alaskan communities.