

Climate Change and Subsistence in Northwest Arctic Parklands

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Project Goals

To help NPS anticipate shifts in subsistence use in Arctic national parklands as the climate changes
To provide a foundation for adaptive, inclusive management of marine subsistence resources

Project Overview

Arctic coastal habitats are vulnerable to erosion with sea level rise, storm surge, and permafrost collapse. These landscape-scale changes are affecting where, when, and how Arctic coastal communities are accessing critical subsistence resources.

The National Park Service (NPS) is responsible for sustainable management of park resources and access to those resources; however, a lack of information on changes in access can limit management planning.



Figure 1. Map of study area.

Our research seeks to understand how climate change is affecting subsistence users' access to marine resources in Cape Krusenstern National Monument (CAKR) and explore how local knowledge can be better included in NPS management (Figure 1).

Methods

Since June 2017, we completed group and individual interviews with 73 **subsistence harvesters in Kotzebue and Kivalina** and 14 **NPS staff who manage subsistence resources**. During the interviews we asked people about climate change effects on subsistence harvest, the role of NPS in managing subsistence resources, how subsistence management could be improved, and local approaches to harvesting. Interview data about climate change perceptions will be compared to existing climate trends (sea ice, wind, precipitation, permafrost, erosion) from the literature. We also **attended four Subsistence Resource Commission meetings** to learn about how local knowledge is incorporated into park policy. Finally, we conducted **focus groups with subsistence harvesters involved with policy meetings** to better understand the barriers to meeting common goals of both subsistence users and managers. Interviews and focus groups were voluntary and confidential.

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Picking berries at fish camp (H. Beutler)



Subsistence chum salmon drying in a Sisaulik fish camp (K. Green)

Acknowledgements: This work was conducted under Stanford University IRB Protocol #40222 and UAF IRB Protocol #1072840. Funding provided by U.S. Department of the Interior, NPS, Ocean Alaska Science and Learning Center under a Cooperative Agreement with UAF (#P17AC00303) and by Stanford University (Emmett, Price, Buckley Families; McGee/Levorson). We thank Maija Lukin (NPS), Alex Whiting (Native Village of Kotzebue), and Siikauraq Whiting (Northwest Arctic Borough) for providing research oversight at all stages. Thanks to Stanford faculty, staff, and students for their feedback and input on the research, especially Nicole Ardoin, Larry Crowder, Rob Dunbar, and Jim Leape. We are immensely grateful to the subsistence harvesters and NPS staff for sharing their knowledge and time.

Preliminary Results, Part One: Iñupiaq Approaches to Hunting and Harvesting

Research Questions

- 1) What are Iñupiaq values and approaches to hunting and harvesting?
- 2) Can these approaches be used to inform NPS subsistence management?

Overview

Documenting Indigenous values from a diversity of community voices has cultural relevance to resource management approaches worldwide¹. Using the Community Voice Method, a film-based approach used to foster dialogue about management issues², we created the film *Respect the Land (Kamaksriñiq Nunam Irrusianik)* with the Community of Kotzebue. Initially, 13 shared values were summarized from 40 interviews with subsistence harvesters from Kotzebue, in response to the question, “Do you follow traditional rules or approaches for hunting and harvesting? If so, what are they?” These values were deliberated and edited by the community to nine final values (Figure 2) during a community meeting. The shared values were also interpreted into Iñupiaq. During the meeting, goals for a film to communicate these values were identified. An overarching message from the community was the need for a collaborative approach to subsistence management and the importance of including Alaska Native people at the decision-making table. The 13 minute film is online: <https://youtu.be/ofHJa3L2yCE>



Next Steps

We are still showing the film to both Indigenous and non-Indigenous audiences and plan to incorporate it into future educational efforts. The community desire to share knowledge with Western managers was prominent in this study, thus this work has inspired us to explore perspectives about resource management from multiple groups (Parts 2 & 3 of this newsletter).

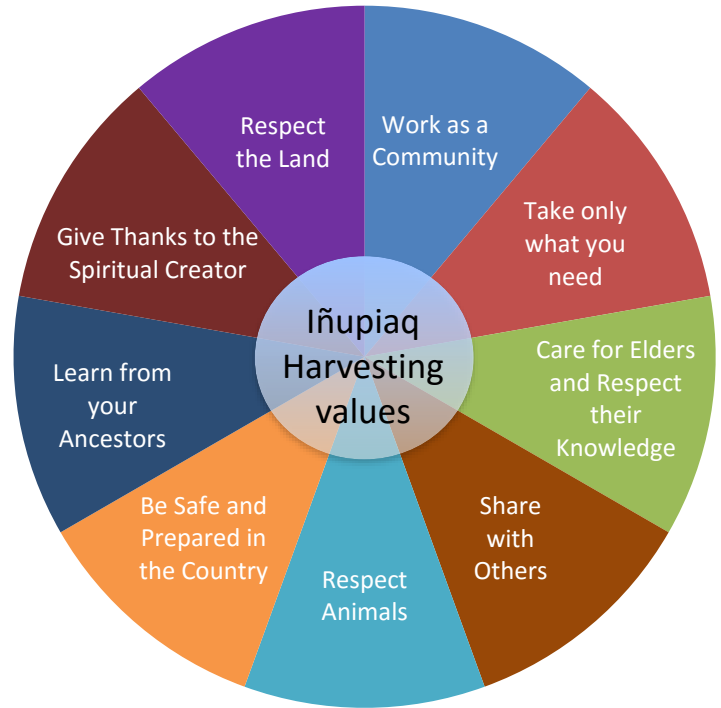


Figure 2. Nine Iñupiaq values generated from community interviews and refined in community meetings.

Outreach and Education

- Film showing to 100 local people at local NPS office
- Film showing and co-taught lesson plan with NPS staff and Alaska Native to 100 Arctic students
- Film published on YouTube in July 2018
- Feature by Stanford Earth:
<https://earth.stanford.edu/news/students-share-subsistence-practices-through-film>
- Peer-reviewed publication: Green, K. Fletcher, S., Beaudreau, A., and Whiting, S. 2019. Iñupiaq Values in Subsistence Harvesting: Applying the Community Voice Method in Northwest Alaska. *Society & Natural Resources*, doi: 10.1080/08941920.2019.1660935



Filming a local subsistence harvester with a lynx skin. (K. Green)

Preliminary Results, Part Two: Changes in Harvest Opportunities: Climate Stressors and Mediating Factors

Research Questions

- 1) What are the climate related access problems for subsistence harvesting?
- 2) Have harvest times changed for species? How?
- 3) What factors mediate subsistence resource access?

Overview

Climate stressors are impacting harvesters' ability to access subsistence resources in NW Alaska. These stressors include sea ice decline and thinning, changes in weather, increased coastal erosion, decreased snow cover, increased high water, permafrost melting (Figure 3). Arctic communities are at the forefront of climate change³; thus, understanding factors that mediate these access problems⁴ is important. For example, in this study mediating factors for sea ice decline might include knowledge (using internet to check sea ice thickness and extent), technology (owning or sharing multiple types of transportation such as boats, snow machine, and ATVs), and authority (access to policy makers/meetings to change harvesting regulations) (Figure 4). Interview data also indicate changes in seasonal availability of coastal species for harvest. (Figure 5).

These changes can affect food security by limiting harvesters' time to hunt. Seasonal harvest regulations for certain animals may need to be adjusted.



Snow machines, boats, and ATVs in Kivalina, AK (K. Green)

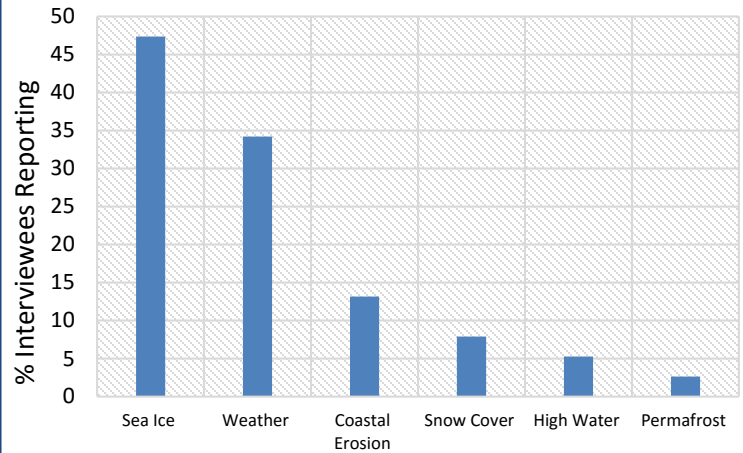


Figure 3. Percentage of interview participants reporting challenges in accessing subsistence resources due to changes in the sea and land.

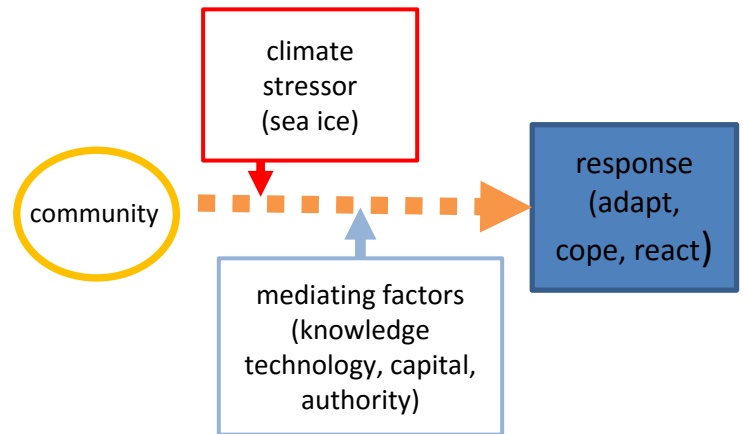


Figure 4. Conceptual diagram of a climate stressor (sea ice) and potential mediating factors (knowledge, capital, technology, and authority) that help harvesters respond (adapt, cope, or react).

Food Types

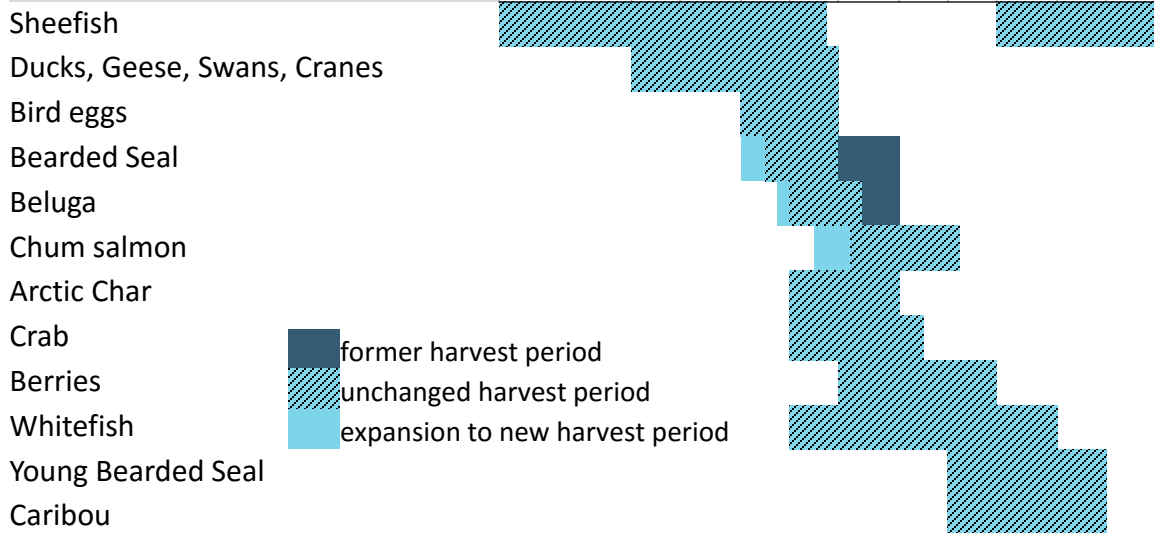


Figure 5. Seasonal timeline of harvest for coastal species (described by at least 10 interview participants). Dark blue indicates a former harvest period that is no longer available, dotted symbols indicate a harvest period that has not changed in the individual's lifetime, and light blue indicates an earlier start to the harvest period.

Next Steps

We will compare the interview data to available environmental data on sea ice, wind, precipitation, permafrost and coastal erosion. Findings from Kivalina and Kotzebue will be compared to explore similarities and differences between coastal villages. We will also identify variation in perceptions of change from interviews with NPS staff, harvesters, and youth groups.

Preliminary Results, Part Three: Challenges and Opportunities for Improving Subsistence Management

Research Questions

- 1) How do harvesters and managers want to improve subsistence management? Do their goals overlap?
- 2) What are the barriers to meeting these goals?
- 3) What facilitates meeting these goals?
- 4) How is local knowledge used in NPS management?

Overview

NPS staff and subsistence harvesters described personal interactions between community members and agency staff as paramount for relationship building and perceptions of trust. Both NPS staff and subsistence harvesters described a similar suite of characteristics as significant for how to improve resource management, including building trust, community engagement, involving youth, strengthening existing partnerships, longevity of agency staff and importance of local hires, and using local and Indigenous knowledge in management (Figure 6).

This research is important for identifying shared values between NPS and subsistence harvesters. To best achieve these goals, we need to understand if current opportunities for collaborating with local users are successful and what the barriers are to achieving goals in resource management.

Citations

1. Castleden, H., Hart, C., Cunsolo, A., Harper, S., and Martin, D. 2017. Reconciliation and relationality in water research and management in Canada: Implementing indigenous ontologies, epistemologies, and methodologies. In: *Water Policy and Governance in Canada* 8(4): 69-95.
2. Cumming, G., and C. Norwood. 2012. The Community Voice Method: Using participatory research and filmmaking to foster dialog about changing landscapes. *Landscape and Urban Planning* 105(4): 434-444.
3. Cisneros-Montemayor, A.M., Pauly, D., Weatherdon, L.V. and Ota, Y., 2016. A global estimate of seafood consumption by coastal indigenous peoples. *PLoS One*, 11(12): e0166681.
4. Ribot, J.C., and Peluso, N.L. 2003. A theory of access. *Rural Sociology*, 68(2): 153-181.



Kotzebue subsistence harvester fishing for sheefish under the ice (K. Green).

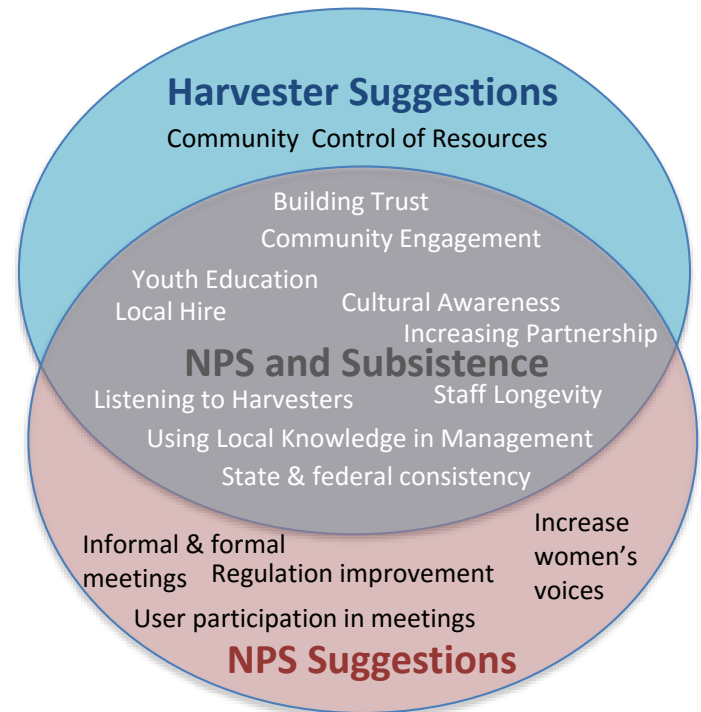


Figure 6. National Park Service (pink) and Subsistence harvester suggestions (blue) for improving subsistence management and areas of overlap (grey).

Next Steps

Analyze subsistence harvester focus group data to better understand the barriers to meeting management goals. Analyze participant observations from NPS Subsistence Resource Commission meetings (policy meetings with advisory board of harvesters) to understand how local knowledge gets incorporated into management.

Preliminary Results Summary

Indigenous knowledge and values are essential to sustainable use of subsistence resources. Management agencies can work to break down barriers for equitable inclusion of Indigenous knowledge in decision-making.

Climate is driving changes in access to subsistence. Mediating factors may help communities prioritize where they should invest resources.

Key coastal species like salmon and seal are harvested earlier and for shorter windows. This has implications for food security and should be considered in proactive management.

Harvesters and managers share common goals in subsistence management, but we need a better understanding of the barriers and bridges to meeting those goals.