



# United States Arctic Research Commission

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WRITTEN TESTIMONY OF  
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FIELD HEARING ON “THE CHANGING ARCTIC: IMPLICATIONS FOR FEDERAL RESOURCES  
AND LOCAL COMMUNITIES”

BEFORE THE SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

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## **Climate change is having serious, real-time impacts on subsistence resources and subsistence users**

Senator Begich, Senator Stabenow, and distinguished guests, thank you for the opportunity to testify on behalf of the U.S. Arctic Research Commission.<sup>1</sup> At the recommendation of Senator Begich, I was appointed by President Obama to the Commission in June of this year to represent indigenous perspectives and to focus on anthropology, subsistence, and education. Additionally, I serve as the director of the University of Alaska Fairbanks Kuskokwim Campus in Bethel, Alaska. I previously served as the director of the Subsistence Division for the Alaska Department of Fish and Game, overseeing research and advocating for the protection of subsistence rights.

As a Commissioner and an Alaska Native subsistence user, I would like to share with you how we are experiencing climate change and how it is affecting our subsistence traditions. Climate change is happening now and collaborative research is needed to understand it and to investigate adaptation and mitigation strategies for Arctic subsistence communities.

In the past two decades, Arctic ambient temperatures have warmed at twice the rate of the rest of the globe.<sup>2</sup> Higher temperatures are becoming more common in autumn and winter, and daily temperature fluctuations have become more extreme.<sup>3</sup> Alaska is also experiencing exaggerated changes in ocean pH (acidity) levels, thawing permafrost, reductions in sea ice, changes in precipitation, storm surges, flooding, erosion, and increased weather variability.<sup>4</sup> As a result of these changes, indigenous peoples of

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<sup>1</sup> Under the Arctic Research and Policy Act of 1984, the seven Commissioners of the USARC are appointed by the president and report to the president and the Congress on goals and priorities for the U.S. Arctic Research Program. That program is coordinated by the Interagency Arctic Research Policy Committee, (IARPC) chaired by National Science Foundation Acting Director Dr. Cora Marrett, who is also an *ex-officio* member of the Commission. See [www.arctic.gov](http://www.arctic.gov) for Commission publications, including the 2009-2010 Goals and Objectives Report.

<sup>2</sup> See Parkinson, A.J. et al., (2005), *Potential Impact of Climate Change on Infectious Disease in the Arctic*, 64 INT'L J. CIRCUMPOLAR HEALTH 478, 479.

<sup>3</sup> Huntington and Fox (2005), *Arctic Climate Impact Assessment*, - Scientific Report. Cambridge University Press, New York.

<sup>4</sup> Warren, J. et al., (2005). *Climate Change and Human Health: Infrastructure Impacts to Small Remote Communities in the North*, 64 INT'L J. CIRCUMPOLAR HEALTH 487.; Parkinson, A.J., (2008). *The International Polar Year, 2007-2008, An Opportunity to Focus on Infectious Diseases in Arctic Regions*, 14 EMERG. INFECT. DISEASES 1, 2.

the Arctic are seeing northward range expansion of flora and fauna, the introduction of non-native species, decreases and changes in traditional food sources, the disappearance of permafrost food storage shelters and ice platforms during marine mammal hunting seasons, and coastal erosion is occurring so quickly in many villages that homes and community infrastructure are quite literally falling into the sea.

Arctic peoples have a long history of adaptation. These changes in climate, however, are occurring much more quickly than ever experienced in the Arctic. The effects of climate change on subsistence resources are especially of consequence to Arctic indigenous peoples. To us, subsistence is much more than using traditional and natural materials for sustenance, tools, transportation, and clothing. Through subsistence, indigenous peoples are able to connect with the land and our place in it; we derive our identities from our homeland. To indigenous peoples of the Arctic, subsistence-based knowledge is the foundation of important cultural traditions.

Subsistence resources are affected by changes in the climate of the Arctic. Our subsistence resources, which form the backbone of our traditional cultural practices, are changing—the places and times where we have hunted and gathered for thousands of years are no longer the same. Additionally:

- Higher than usual temperatures are becoming more common, as are extreme weather events. Weather conditions that might be seen as negative in urban communities are often seen as favorable in subsistence communities. These include rains that make berries and vegetation grow, and blizzards and freezing temperatures that result in conditions that improve winter travel;
- Winter storm surges are eroding coastlines, washing out roads, and making travel difficult. A recent General Accountant Office report found that 90% of Alaska's 213 predominantly Native villages are regularly affected by floods or erosion. Communities are increasingly vulnerable as winter freeze up occurs later and later in the season. This lack of early autumn sea ice places many villages in great danger of storm impact in the absence of ice to control wave action. Storm impacts endanger human life, damage infrastructure and result in erosion;
- Hunting is dangerous or impossible on ice when early breakup and late freeze-up create poor ice conditions. Many traditional hunters have difficulty gaining access to land mammals (e.g., caribou) because insufficient snow prevented effective use of snow machines. Access is restricted to subsistence resources and there is increased risk and reduced efficiency to our hunting;
- Quality of animals is changing—for example, because ice seals have thinner blubber, it takes more of them to produce the amount of oil we need to get through the winter—or we just do without;
- Lack of haul out ice platforms for seals and walrus is causing problems for the species and is reducing hunter access;
- The composition, distribution, and density of subsistence species are changing. These changes directly affect the subsistence species available for harvest;
- Thawing of permafrost results in habitat changes, sinking buildings and melting ice cellars, making long-term storage of traditional foods more difficult. It also preconditions the land for greater impacts from secondary storm surges, as described above;
- Fisheries are changing with changes in ocean circulation, currents, water temperatures, ice coverage and nutrient availability. Decreases and changes in anadromous fish stocks directly affect the economic and dietary well being of subsistence users; and

- Changes and interruptions are occurring in the passing of traditional ecological knowledge (TEK).

Health and cultural activities of Alaskan Native peoples will be harmed by a decline in subsistence practices. Subsistence diets are rich in fish and marine and land mammals and offer numerous health, social, cultural, and economic benefits. Proven health benefits include protection from cardiovascular disease and diabetes and improved maternal nutrition and neonatal and infant brain development. With the cost of a pound of ground beef upwards of \$10, and little or no available fresh produce in many villages, there are also serious economic and health implications related to a decline in subsistence practices that may result from climate change.

Emigration is a serious problem in many villages. This is a phenomenon that needs further study, but is likely to be exacerbated by a decline in subsistence success caused by climate change. As subsistence opportunities decline, it may become cost prohibitive to stay in the village, encouraging residents to relocate to hub villages and Anchorage. Angayuq Oscar Kawagley has written that many social ills of rural Alaska can be attributed to the disenfranchisement of Alaska Natives with our cultural traditions. Subsistence is a key component of our cultural traditions. Separation of Alaska Natives from our cultural traditions may lead to feelings of decreased self-worth and foster substance abuse, violence, and suicide. It is important to protect subsistence cultural traditions.

To understand the dynamics of climate change and subsistence harvest and use, there needs to be greater emphasis and coordination of research among the agencies. The need for research is two-fold. First, to understand traditional ways of knowing and action, agencies must collaborate with indigenous Arctic populations—to establish a baseline of understanding of topics such as where berries grow, when and where ice develops, and the thickness of seal blubber and caribou skins. I note that there is a wealth of this type of information at the Division of Subsistence, Alaska Department of Fish and Game. The division is charged with providing information to ensure that the state implements the subsistence priority law. To understand how subsistence resources are changing while providing for validation of indigenous knowledge, agencies should conduct research in collaboration with tribal groups. Only after we understand how subsistence resources are changing can the most effective policies be developed for protecting subsistence traditions.

Policy measures need to be developed to help build resilience. Co-management groups need to be supported and strengthened so they can play a strong role in relaying local concerns and potential solutions. In the past, these groups have played an important role, but as climate continues to change and litigation continues in regard to subsistence resources and climate change, co-management groups should play an elevated role, they should conduct additional research, and funding should be reprioritized in order to fulfill these tasks. Currently, the Senate version of the Commerce, Justice, Science and Related Agencies Appropriations Bill includes funding for seal and Steller sea lion research, Alaska Native marine mammal co-management, Bering Sea crab management and research, and ocean acidification research. These requests are included as part of the C-J-S bill at the request of Senators Begich and Murkowski.

In conclusion, the federal government has acknowledged that it has trust responsibilities to American Indian and Alaska Native people that include providing for health, safety and cultural preservation. Climate change endangers this trust responsibility because it may harm subsistence resources, and result in health declines in subsistence users, foster social ills, and inhibit cultural preservation efforts. Congress should look for ways to encourage greater collaboration among the agencies, scientists and tribes to evaluate climate change and its effect on subsistence and to develop consensus on mitigation strategies. Additionally, policies should ensure that traditional ecological knowledge is used in developing resource management decisions.