



United States
Environmental Protection
Agency

OPPTS Tribal News

Spring 2008

Alaska Volume 1



Exposing its Ancient Ice



Environmental
voices

Office of Prevention, Pesticides,
and Toxic Substances and
Tribal Environmental News Exchange

www.epa.gov/opptintr/tribal



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Exposing Its Ancient Ice

Recent evidence suggests that over 10,000 years ago, the Columbia and Woolly Mammoth ended their reign in Alaska and other parts of North America due to a sudden short glacial re-advance that caused a profound environmental change.

Alaska may be experiencing another profound environmental change. Scientific documents in the last few decades have indicated that it is indeed getting warmer and, as a result, the ice is melting. The extensive Alaskan Tundra covers most of the land base of Alaska. Its surface layers, which traditionally freeze and melt with each season, are now melting and exposing its permafrost. Permafrost is known to contain ice and organic material that has been suspended for thousands of years. Some of this organic material contains Columbia and Woolly Mammoth remains that hold the much sought after ivory tusks. In many instances, these mammoths have not been exposed in over 10,000 years!

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OPPTS Tribal News, Volume 5, Number 2
 EPA 745-N-00-001
 ISSN: 1555-3175 (on line) 1555-3183 (in print)

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OPPTS Tribal News requests interesting, relevant stories about pesticide and pollution prevention programs and projects in Indian country from our readers. If you want to share your experience with our readers, please write or send an email message to Mary Lauterbach, EPA Office of Pollution Prevention and Toxics, 1200 Pennsylvania Avenue (MC7408M), Washington, DC 20460, lauterbach.mary@epa.gov.

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What's to Come !

Volume one of this issue devoted entirely to Alaska contains an overview of the political and cultural history of Alaska Natives, articles on science and research efforts in Alaska, and our Kid's Page.

Volume two of this issue contains: summaries of current environmental issues and concerns including climate change, wildlife, endangered species, impacts from the mining and oil industries, and solid waste and toxic contaminants issues; articles focusing on programs and initiatives; and, success stories. Also contained in this volume are insights from Alaska Native elders and a Kid's Page focused on traditional storytelling.

We at "OPPTS Tribal News" took the unprecedented step in mailing out a letter to all of the federally recognized tribes in Alaska announcing our publication and inviting them to contribute any relevant tribal environmental information they may want to share with others in this publication. We thank the contributors that responded to this request and are pleased to include their comments and opinions.



Alaska Facts:

- ▶ Alaska is the largest of the 50 states. It is comprised of 586,412 square miles of land and 6,640 miles of coastline.
- ▶ Alaska has 17 of America's 20 highest mountains, 70 volcanoes, 3,000 rivers, over 3 million lakes, and more active glaciers and ice fields than anywhere in the inhabited world. Source: Alaska Native Heritage Center.
- ▶ On October 18, 1867 Alaska officially became the property of the United States.
- ▶ Alaska officially became the 49th state on January 3, 1959.
- ▶ Alaska's most important revenue source is the oil and natural gas industry. However, the fishing and seafood industry is the state's largest private industry employer.
- ▶ Alaska accounts for 25 percent of the oil produced in the United States.
- ▶ The Trans-Alaska Pipeline moves up to 88,000 barrels of oil per hour on its 800 mile journey to Valdez.
- ▶ State flower: the wild forget-me-not
- ▶ State bird: the willow ptarmigan
- ▶ State tree: the Sitka spruce
- ▶ State fish: King salmon
- ▶ State sport: dog mushing
- ▶ State motto: North to the Future
- ▶ State gemstone: Jade
- ▶ The discovery of gold in the Yukon began a gold rush in 1898. Later gold was discovered at Nome and Fairbanks.
- ▶ At 20,320 feet above sea level, Mt. McKinley, located in Alaska's interior, is the highest point in North America.
- ▶ Juneau is the capital of Alaska and the only city in the United States accessible only by boat or plane.
- ▶ The Alaskan malamute sled dog is strong and heavily coated. It was developed as a breed by a group of Eskimos named the Malemiuts.
- ▶ Alaska's name is based on the Eskimo word Alakshak meaning great lands or peninsula.

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Mark Your Calendars!

June 23-27, 2008

8th National Tribal Conference on Environmental Management

Billings, Montana
www.ntcem8.com

July 17-20, 2008

Indigenous Environment Network (IEN), Protecting Mother Earth's Call for Healing – Reaffirming Our Roots.

Lee, NV
www.ienearth.org

July 16-18, 2008

Native American Water Association (NAWA) 13th Annual National Gathering of Tribal Drinking Water and Wastewater Professionals and Tradeshow

Prior Lake, MN
www.nawainc.org/gathering.htm

From the Editor...

I am pleased to provide our readers with this issue devoted entirely to Alaska. This publication provides an overview of the history and culture of Alaska Natives with a visit to two Native Villages, articles on science and research efforts in Alaska, and our Kid's Page activity. It also features articles on common environmental issues and concerns, technical research initiatives, tribal success stories focused on improving the environment, a traditional storytelling Kid's Page, and a few words from some Alaska Native elders.

Alaska is many things to many people. For those people who have been to Alaska, none can deny its sheer size, complexity, scenic beauty, great diversity and uniqueness of its living things, and its vulnerability to great changes. Many Americans referred to Alaska as "the Last Frontier." For centuries, however, many of its indigenous people referred to Alaska as "the Great Land."

For the first time, several of us working for the "OPPTS Tribal News" were able to attend an EPA, Region 10, Tribal Leaders' Summit in Sitka, Alaska, and met many Alaska Natives and Tribal members from many regions of the state. We also were able to visit the south central areas of Alaska. We have many to thank for assisting us in our visit. We would like to take this opportunity to acknowledge an EPA colleague, Jennifer Curtis, from EPA Region 10, Anchorage, Alaska. Jennifer helped in planning the trip to Alaska, provided training, and escorted us to the communities of Nanwalek and Kenai. Without her kind assistance, we would not have been able to make these informative trips.

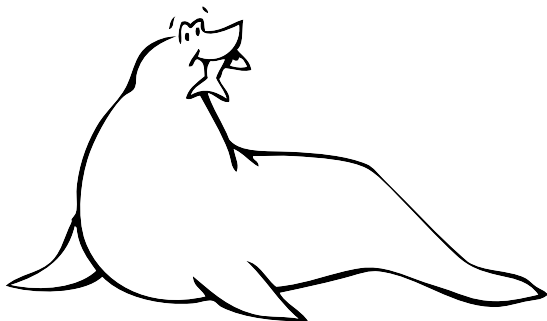
As always, this publication is a direct result of contributions by EPA, Tribal representatives, Alaska Natives, and many other different organizations. I especially want to thank my intern Haliey McKenzie, a member of the Cherokee Nation. Hailey earned an undergraduate degree in history and political science from the University of Oklahoma. Her endless enthusi-

asm and creativity for this project was amazing as she researched and collected materials for many of these articles. She provided many creative ideas for design and layout, kids page activities, and interviews with the elders. Not unlike other interns, Hailey has much to be proud of in developing this publication and having her voice heard along with many others.

From our past environmental record and experience, there is a significant and urgent need to recognize the great impact that human activity can have upon the environment. The challenge for all is to learn to manage our environment more effectively through applying collective wisdom, including science and traditional knowledge, and principles of environmental stewardship that Alaskan Natives and Tribes have practiced for centuries.

Let's remember that there is a "Great Land" that exists to the north known as Alaska.

— Mary Lauterbach, OPPTS
Tribal News Editor



OPPTS Tribal News Mission Statement

OPPTS Tribal News strives to provide an opportunity to promote a two-way dialogue with EPA and American Indian Tribes, including Alaska Natives, regarding a vast array of environmental issues and concerns that affect Indian country. The mission and hope of the publication is to maintain an open, constructive exchange of information among the federal government, Tribal governments, and Tribal organizations. Together, we can build mutual understandings and forge effective partnerships to achieve our common goals of protecting the water, air, land, and communities, now and for generations to come.

OPPTS Tribal News Staff

Introduction

-Carol Jorgenson, Director of the U.S. EPA's American Indian Environmental Office

OPPTS Tribal News has had the pleasure to sit down with two environmental stewardship leaders to discuss their continued support of our national environmental protection goals and issues important to Alaska Natives. Below, Steve Johnson, EPA Administrator, discusses his agency's efforts in partnering with tribal organizations. Carol Jorgenson, EPA American Indian Environmental Office Director, provides the introduction.

I am so pleased that this publication is dedicated to Alaska. Our diverse programs within EPA are critical in the area of environment and health for the Alaska Native/American Indians. The Indian Environmental General Assistance Program Act of 1992 was passed to help all federally recognized tribes develop and establish environmental programs to protect human health and the environment. GAP is the largest single source of funding for tribal environmental programs awarded by EPA.

One of our many responsibilities is to work with each Region to allocate GAP funding for the

number of tribes they have who have successfully applied for GAP. Alaska has 229 tribes, and a great many of them are not on a road system, nor do they have safe drinking water and sanitation. That is why I am pleased that we will get an Eagle view of some of the many challenges Alaska faces. Alaska is a fifth of the land mass of the United States, within Alaska, you have diverse cultures, such as Yupik, Inupiaq, Aleut, Athabascan, Eyak, Tlingit, Haida and Tshimsian, and among these tribes are different dialects, customs, and lifeways.

As you read this publication, I want you to know that a tremendous amount of effort went into listening to Elders and Native people to understand from their point of view what are their major issues and concerns. Like all indigenous people of the land, their expertise and knowledge is valuable and important if we are going to work together to provide a better future for generations to come. The Alaska Native people have lived on this magnificent land for thousands of years, and we have much to learn

from them. I know, because I have set at the knee of my Elders, as a Tlingit woman from Alaska, and learned to respect all living things, and to treat each animal, bird, plant, tree, fish and the four elements with great reverence, learning from each, their way of life. I won't go into that now, but I believe the publication does a great job of sharing Alaska Native peoples commitment to the land.

I want to thank OPPTS for walking into new territory to help us understand the Alaska issues for a healthy environment for all it's inhabitants. Gunal Cheesh, Ho Ho.



EPA Web sites and Hot Lines	
EPA	www.epa.gov
OPP	www.epa.gov/pesticides/
OPPT	www.epa.gov/oppt
Pollution Prevention	www.epa.gov
American Indian Environmental Office	www.epa.gov/indian
Asbestos Abatement/ Management Ombudsman Hotline	1-800-368-5888, 202-566-2855
National Lead Information Center & Hotline	1-800-424-LEAD, 1-800-424-5323 www.epa.gov/lead/pubs/nlic.htm
National Pesticide Information Center	1-800-858-7378 npic.orst.edu
Toxic Substances Control Act (TSCA) Hotline	202-554-1404

Interview with EPA Administrator, Steve Johnson !

OPPTS Tribal News: We understand that you visited Alaska in August 2005. While visiting, what impressed you the most about its land and Alaska Natives?

Mr. Johnson: While visiting Alaska I was most impressed by its diversity and rich cultural heritage. I explored big cities like Anchorage and traveled to small villages where people still live in traditional ways. There were opportunities to experience Alaska Native arts, culture and customs in both.

OPPTS Tribal News: During your Alaska Native Tribal Health Consortium speech in Anchorage, you mentioned that EPA, along

with tribal governments, the Alaskan state government, and other federal agency partners, have come a long way in addressing the need to improve sanitation and delivery of safe drinking water. What were the most important tasks performed by EPA and its partners resulting in the increase of safe drinking water systems servicing tribal communities?

Mr. Johnson: Protecting our nation's drinking water and wastewater infrastructure is a top priority for EPA. In Alaska, and throughout our nation, water is the lifeblood of our bodies, our economies, and our well-being. EPA's Alaska Native Village Infrastructure

Program, which provides funding to the State of Alaska, has played a major role in providing sanitation infrastructure in Alaska Native Villages and rural Alaska communities, many of which were without flush toilets and running water. Thanks to our collective efforts, the number of households supplied with 21st Century sanitation systems and drinking water treatment plants has risen steadily. Today, approximately 90 percent of the homes in Alaska Native Villages and rural Alaska are served – or funded to be served – by a piped system.

OPPTS Tribal News: You have said collaboration is essential in addressing the environmental challenges of the 21st Century. How can EPA work with Alaska Natives to conserve resources and protect the environment?

Mr. Johnson: EPA has learned when working alone, our nation's environmental progress is limited. However, when we collaborate with our partners, our environmental successes can accelerate at a remarkable pace. In addition to providing water infrastructure funding to the State of Alaska, EPA's Alaska Native Village Infrastructure Program is helping to teach rural Alaskans how to operate and maintain water and wastewater utilities. Through the Remote Maintenance Worker Program and the Rural Utility Business Advisor Program, we're providing cities and villages with both training and technical assistance.



Administrator Johnson on Trip to Alaska 2005





OPPTS Tribal News: After visiting with Alaska Natives, what were some of the greatest environmental issues most communities brought to your attention?

Mr. Johnson: Although we have come a long way in dealing with the need to improve sanitation and the delivery of safe drinking water, we also have a long way to go. There are still too many places where sewage lagoons leak into the ground water, lakes and rivers that are the source of drinking water. We must find ways to ensure that new landfills, sanitary treatment systems and drinking water plants are properly operated and maintained. Improving rural sanitation is also important to sustaining the traditional subsistence lifeways, because the pollutants in lagoons and dumps can contaminate the foods upon which so many depend.

OPPTS Tribal News: Alaska is now at a crossroad when it comes to making important decisions regarding future development and industry changes. What factors do you feel are important to ponder when lawmakers and industry leaders are making these decisions?

Mr. Johnson: When I think about the environmental challenges our nation faces, I am struck by how many of them are related to growth and development. Lawmakers and industry leaders must appreciate our built environment has a vast impact on our natural environment, our economy, and our well-being. However, with some forethought and planning, we can reduce these impacts. By adopting green building strategies for example, we can make certain our buildings are designed, built and operated in efficient, environmentally responsible ways. Fortunately, companies, communities and individuals across the country are realizing the environmental and economic benefits of “going green.” Today, leading companies are setting their sights not just on better ways to comply with environmental laws, but on creating sustainable operations to protect our natural resources. Communities are promoting energy efficiency, as well as giving private developers incentives to do the same. And individuals are appreciating that protecting our environment can be as simple as making responsible everyday choices. All of us – whether in our professional or

personal lives – can minimize our impacts on the environment.

OPPTS Tribal News: In what ways will EPA continue to meet its goal in helping Alaska Natives maintain their traditional lifeways and sustain a high quality of life?

Mr. Johnson: For centuries, Native Americans and Alaska Natives have been respected for their commitment to Mother Earth. At EPA, we share in the obligation to pass down a cleaner, healthier environment to future generations. By working together, along with others who share our commitment to maintaining traditional lifeways and sustaining a high quality of life, we can continue to protect the health of Alaska Natives and the rich environment that has sustained them through the ages.



Community Action for a Renewed Environment (CARE-Alaska) !

Community Action for a Renewed Environment (CARE) is a competitive grant program that offers an innovative way for a community to organize and take action to reduce toxic pollution in its local environment. Through CARE, a community creates a partnership that implements solutions to reduce releases of toxic pollutants and minimize people's exposure to them. By providing financial and technical assistance, EPA helps CARE communities get on the path to a renewed environment. For more information please visit www.epa.gov/CARE

Nelson Island Consortia Logo

In Alaska the Nunakauyarmiut Tribe is the recipient of a Level I CARE cooperative agreement. The Nunakauyarmiut Tribe is the federally recognized Tribal government in Toksook Bay which is one of the members of the



Nelson Island Consortium (NIC) of Caninermiut and Qaluyaat Communities, the closest translation from Yup'ik to English is "Working Together to Keep the Coastal and Nelson Island Communities and Environment Clean."

The seven remote villages—in the consortium—Chefornak, Newtok, Nightmute, Umkumiut, Tununak, Toksook Bay, and Kipnuk—reside within the Yukon Delta National Wildlife Refuge and are only accessible by airplane,

boat, and, in winter, snowmachine. The villages are more than 98 percent Alaska Native and range in size from 232 to 690 people, with a total population of 2,617, about 20 percent of the Yup'ik-speaking population. Approximately 73 percent of the adults are not part of the cash economy, and 25 percent of the population lives below the national poverty line. The area has a 186 percent cost-of-living differential from the national urban average.

These communities face challenges. Except for Toksook Bay, there are no household piped water or sewer. About 10 percent of the households have flush tank haul systems, and more than three-quarters of households use 5-gallon buckets ("honeybuckets") for human waste, which haul to unlined, untreated ponds or wooden bunkers. The transport of raw human waste in open containers over well-trafficked boardwalks presents a high exposure risk, and the disposal ponds often flood into local subsistence areas. Although the local public health service watering points are available, most residents in each community get their drinking water from local untreated sources such as rain water, streams, ponds, ice, and snow melt. In addition, the terrain and topography of the communities are affected by climate change. For example, the community of Newtok is currently threatened by coastal erosion at the rate of 100 feet a year. During fall 2006, the community lost heavy equipment because of the erosion.





Joining Together

NIC was formed in 2004 by Newtok elders concerned about contamination to their traditional subsistence sites, as the communities share the same subsistence areas and have close social and family ties. The meetings led by the elders cover how the pollution can affect traditional subsistence lifestyles and agreements to clean-up lands and protect communities.

Identifying Problems, Solutions

NIC holds teleconference calls weekly and community meetings four times a year. Their focus is to examine toxics issues, educate the community about those issues, further develop the partnership, and plan public summit workshops with expert speakers. The NIC is using the CARE Roadmap. Once completed, NIC will have a matrix of environmental health issues of concern, which can be developed into an action plan. In addition, an interagency planning group has formed to coordinate efforts to relocate Newtok because of its

erosion problem. For more information see the following website:

http://www.commerce.state.ak.us/dca/planning/Newtok_Planning_Group_Webpage.htm

Implementing Solutions to Reduce Risks

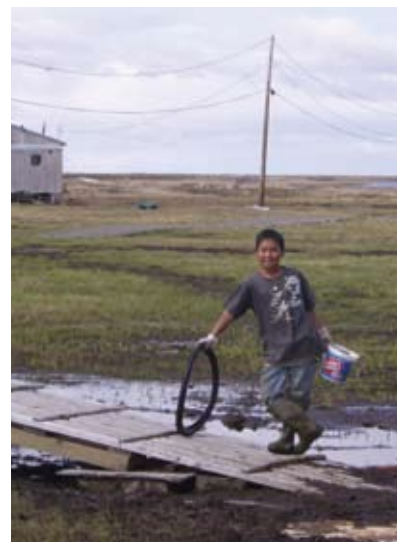
NIC has accomplished the following tasks:

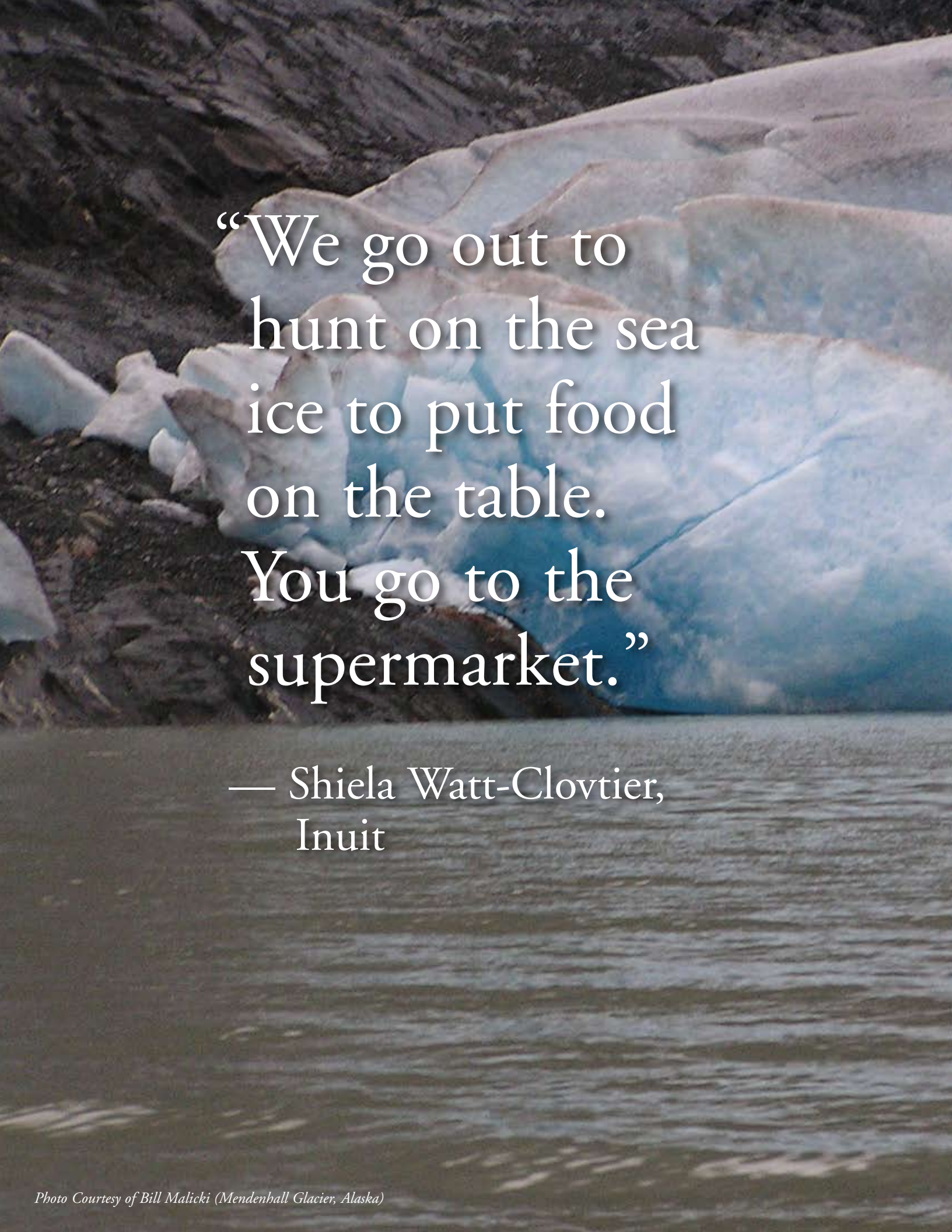
- A water quality monitoring program for the subsistence areas
- Pamphlets for hunters based on elders' wisdom and staff research
- Monitor campsites for littering and appropriate vehicle use (to reduce emissions and tundra tear)
- Ensure fish nets are not left in waters
- Work to switch the use of chain saws to hand augers for ice holes, and shotgun lead shots to alternative shot
- Solid waste management planning and education
- Recycle aluminum cans
- Back haul of lead acid batteries
- Demonstration project on composting toilets

- Safely removed Freon from refrigerators

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A photograph of a glacier with large chunks of ice floating in the water. The ice is a mix of white and light blue, with some darker blue veins. The water is a dark, murky brown. The glacier is in the background, and the ice chunks are in the foreground.

“We go out to
hunt on the sea
ice to put food
on the table.
You go to the
supermarket.”

— Shiela Watt-Clovtier,
Inuit

The History of the Indigenous People in Alaska

*Evon Peter, Chairman of Native Movement and Former Chief of the Neetsaii Gwich'in
Adapted from "Indigenous Peoples of Alaska," Native Movement, 2003.*

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Chief Evon Peter summarized his knowledge of the history of Alaska Native Peoples in his published work "Indigenous Peoples of Alaska." Chief Peter documents that at least seven Nations of people, each possessing a distinct language, culture, history, spirituality, and land base inhabit the land known as "Alaska." They are the Athabascan, Inupiat, Yup'ik, Tlingit, Haida, Unungan (Aleut), and Tsimpshian Nations. The following article is adapted from Chief Evon Peter's published work *Indigenous Peoples of Alaska*.

In the mid-1700's, foreigners came to Alaska from both the east and west. The British, French, and Spanish traveled from the east, already having encountered the Indigenous Nations of the Mayans, Incas, Iroquois, Cherokee, and Navajo. The French came to Alaska from the northeast and brought fiddle music, tea, crackers, tools, and alcohol. The village of Fort Yukon, where European traders set up their post, now sits where the Gwich'in have gathered for thousands of years to celebrate and trade. The foreigners sought fur, wood, salmon, gold, and later, oil.

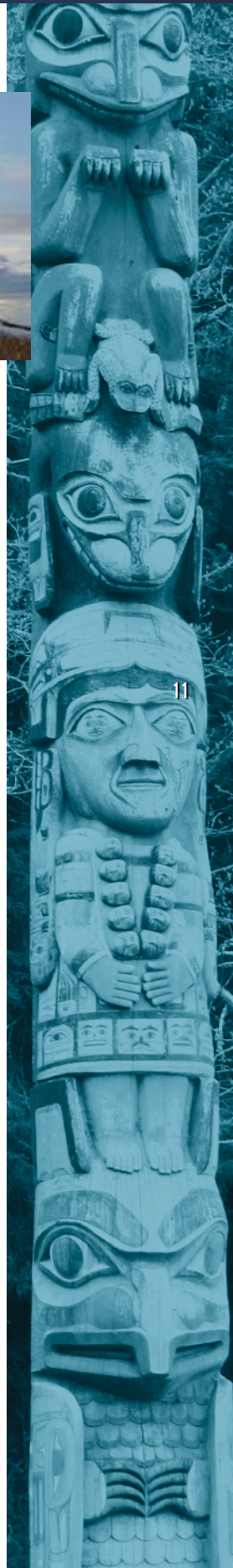
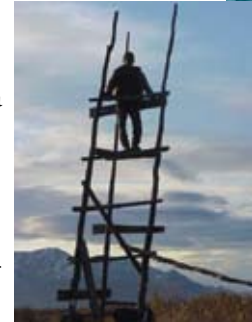
From the west, a Russian man named Vitus Bering sailed towards Alaska and landed on one of the Aleutian Islands. The Russians were interested in furs, particularly the sea otter pelt, because their value exceeded that of gold in China at the time. Russians had a hard time catching the sea otters on the rough waters, so they enslaved the Unungan people to hunt for them. They held for hostage Unungan women and children and required the men to bring them sea otter pelts every day in order to see their families. During that period, the Unungan organized two unsuccessful uprisings against the Russians. Russia was the first country among a small group of European nations to claim Alaska as their territory. Later, the Russians were defeated in battles by both the Tlingit and Ahtna Nations.

In the mid 1800's, Russia became worried that the United States of America (US) would try to forcefully take Alaska during their westward expansion. This resulted in the signing of the Treaty of Cession in 1867, which documented payment by the United States to Russia for Alaska, at a few cents per acre. The Indigenous Nations of Alaska, who are the original land-holders, did not participate in the discussions or negotiations of this sale. Indigenous People were not considered fully human and thus were not consulted during the negotiations.

In 1959, the United States

established Alaska as a state within the union despite international interest in decolonization (returning of stolen land to Indigenous Peoples), as was beginning to happen in Africa. Later, in 1971, Congress enacted the Alaska Native Claims Settlement Act (ANCSA), which terminated Alaska Native land claims within the US legal system. ANCSA was not a treaty between the Indigenous Nations and the US. Through ANCSA, the United States paid nearly one billion dollars to for-profit federally established Native corporations for taking the vast majority of Indigenous nation lands and left the remaining 44 million acres under the control of the same corporations.

The relationship between the Indigenous Nations of Alaska and the United States needs to be healed because it is out of balance. Policies of colonization, such as unilateral government actions, assimilation, and termination of Indigenous rights, allowed for the current situation of oppression and control to exist. Many Indigenous Peoples struggle for basic human rights, quality education, and jobs, while at the same time over a hundred million dollars in natural resources are exploited from Indigenous nations lands in Alaska every year.



History & Culture

Alaska Native Lands

William C. Cantry, Jr., American Native Law

Alaska Native Claims Settlement Act (ANCSA of 1971)

Parts of this chapter have been adapted from EPA's resource guide "Working Effectively with Tribal Governments."

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Alaska Natives hold their land as determined by the Alaska Native Claims Settlement Act (ANCSA) of 1971. The Act was a Congressional response to the discovery of oil in Alaska and the need to achieve finality regarding the ownership of land and mineral rights by resolving extensive Alaska Native aboriginal land claims. The Act extinguished all aboriginal land claims, including claims to submerged lands, and aboriginal hunting and fishing rights. The Act also extinguished all the Indian reservations in Alaska, except for the Annette Island Reserve of the Metlakatla Indian Community. In exchange, Congress authorized the transfer of \$962.5 million and approximately 44 million acres of land to village and regional corporations whose shareholders were Alaska Natives.

Village corporations own the surface rights to land around the villages for the benefit of the village Native people, while all of the ANCSA land and its subsurface resources are owned by the Regional corporations. ANCSA corporations hold title to land in fee simple, with no federal

restrictions on subsequent transfers of the land. Native shareholders, however, originally could not transfer their corporate stock for 20 years, and the Act was subsequently amended to allow corporations to extend the prohibition on transfers.

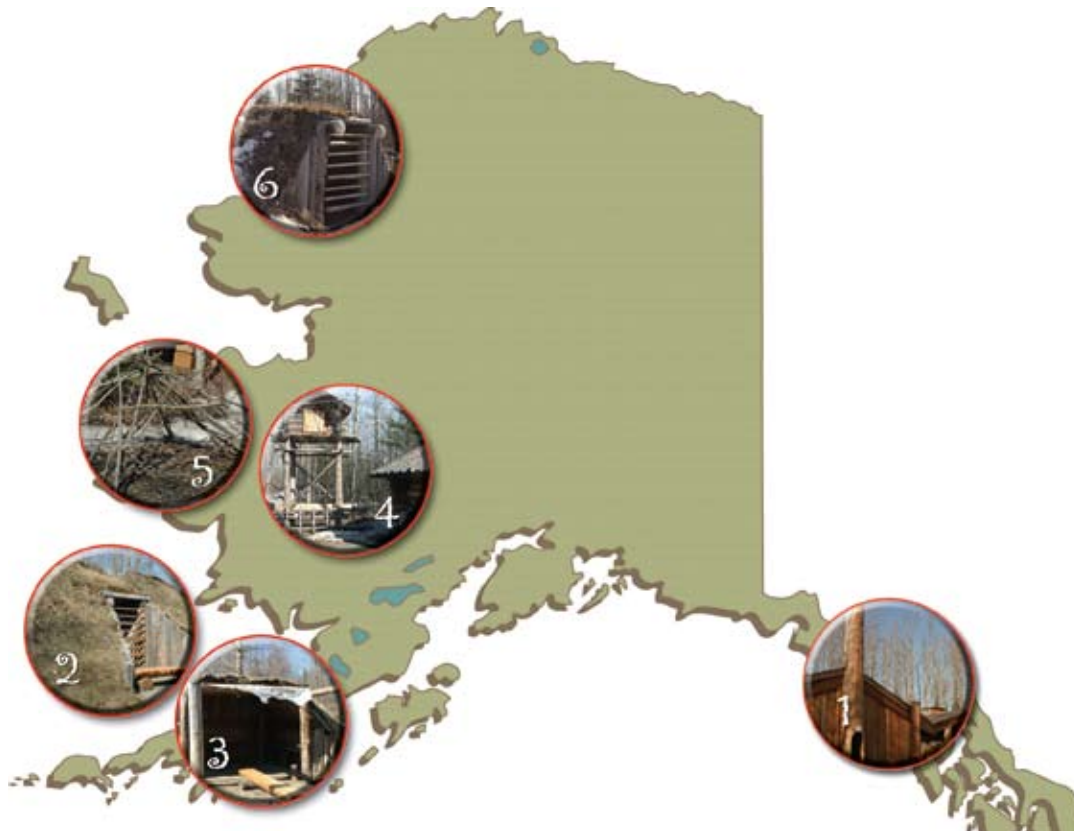
The federal government recognized Alaska Native governments for the purposes of native programs for many years before ANCSA, and approved the constitutions of Alaska Tribes pursuant to the Indian Reorganization Act. The Bureau of Indian Affairs (BIA) has recognized more than 220 Alaska Native entities as eligible for services and as having the powers and privileges of other Tribes. And the Internal Revenue

Service included the villages listed in ANCSA in the list of tribal governments eligible for benefits under the Tribal Tax Status Act of 1982.

There has sometimes been confusion as to which entity in a particular region is the federally-recognized tribal government, because the same Alaska Native village may have an ANCSA village corporation, a municipal government formed under state law, and a traditional council or council organized under the Indian Reorganization Act. EPA's policy is to regard only the governmental entity listed by BIA as the federally-recognized tribe under the EPA National Indian Policy and other federal laws and regulations applying to Indian tribes.



The Indigenous Cultures of Alaska



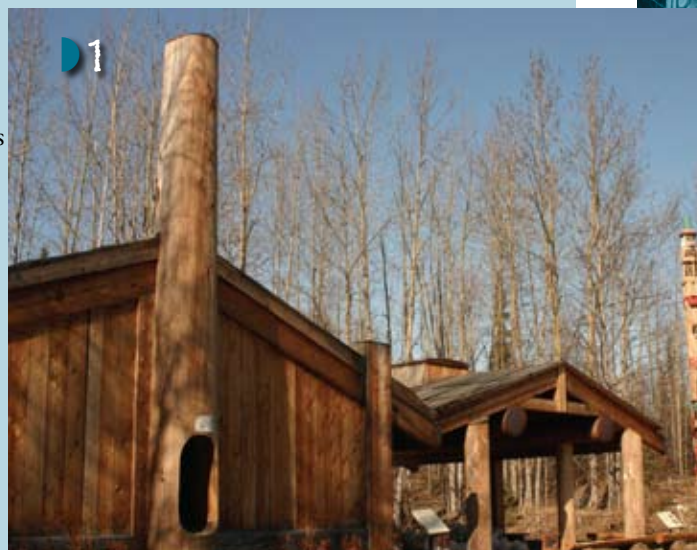
1. The Clan House

Some 9,000 years ago, people used large boulders set on edge to build the walls of the earliest Aleutian Island winter dwellings. Later, they dug their semi-subterranean houses into the ground. These large oblong homes were framed with whalebone or driftwood and covered with sod.

The clan house was a massive plank house with cedar posts and spruce beams, with variations built throughout the regions. Formline art on the clan houses identified the owners. The children inherited all rights through their mother, including names; the use of clan fishing, hunting and gathering land; and the right to use specific clan crests as designs on totem poles, houses, clothing, and ceremonial regalia.

The carving shed was used to protect carvers while in the process of creating art—totem poles, house screens, canoes, painted bentwood boxes, storage chests, and regalia.

Eyak, Tlingit, Haida, and Tsimshian People



History & Culture



2



3

2. The Long House

3. Long House Shed

The long house (ulax) was large enough to house four or five families. People entered down a notched ladder through the smoke hole. The Alutiiq dwelling (ciqluaq) had a short subterranean tunnel-like entrance. Both types of houses had a drainage ditch built into the floor, and bear and marine mammal intestine “windows” in the roof. Eastern Aleutian

settlements could have up to six long houses, each from 70 to 200 feet long, and serve as home to as many as 10 to 40 families. Each might have 10 rooftop entry hatches, which also let in air and light.

Small sleeping side chambers and storage units surrounded the house. Some were free-standing, while others were connected to the house by tunnels.

Aleut and Alutiiq People



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4. Family Lodges and Cabins

5. Emergency Mobile Shelter

Athabascan pole and log dwellings were similar to historic log cabins that they later adopted. In colder areas, lodges were sunk two to five feet into the ground. On the milder shores of Cook Inlet, Athabascans built log houses above ground. They slept in the back area and used the front area for cooking and drying. In earlier versions of the log cabin, pairs of vertical posts were placed at the four corners and used to frame the single doorway. Logs stacked between were lashed to the corner posts, and many were covered with moss, sod, caribou skin, birch bark, or spruce bark to form the roof. A stormshed passageway to the door kept out the cold. Windows of tanned mountain sheep intestines let in the light.



5

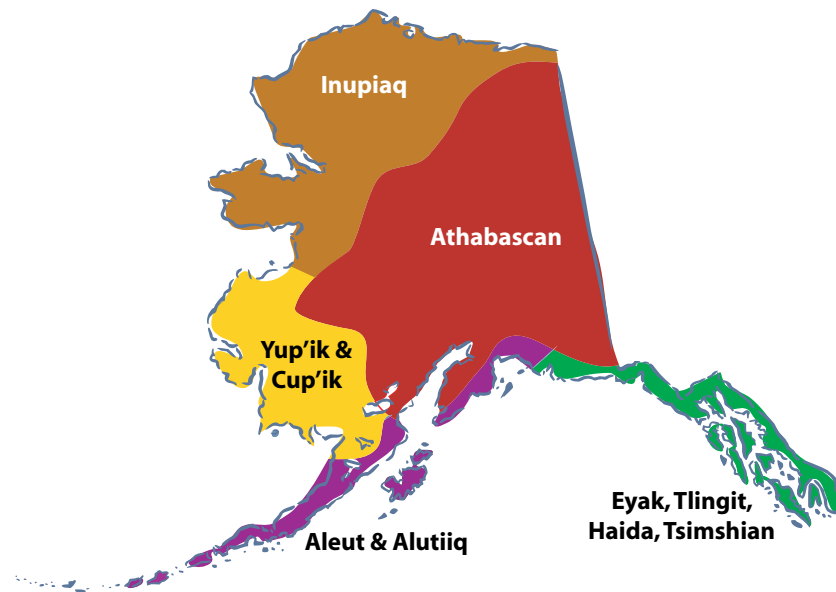
Athabascans were masters at designing a variety of simple and functional shelters, that kept them both warm and mobile as they set out to hunt and trade. Emergency mobile shelters were constructed in minutes. A wandering hunter would pile up brush to crawl under at night, dig a hole in a snow bank and ice over the interior with the heat of an oil lamp, or construct a conical tent by bending over and lashing together several alders, covering them with bark and caribou skin. Dirt and moss piled high along the sides provided insulation. A second layer of skin, moss, a thatch of grass, or willow brush kept out the rain.

Athabascan People



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6. The Winter House

In general, winter houses on the mainland were built into the ground to insulate against severe weather and winter cold. Variations in house style occurred between mainland and the island communities. Because of rocky soils, many of the houses on islands were built above ground.

A typical house could be 10 feet-by-12 feet, but varied from family to family. Family members slept on polar bear and caribou skins on raised platforms or on floors of driftwood. An intestine-covered opening provided light overhead. Seal-oil lamps helped heat the house.

Temporary winter houses were more likely to be ground-level, willow-framed, oval or round tents, covered with reindeer or seal skin, moss or sod.

The Yup'ik and Cup'ik people also shared women's family and men's family homes. The Ena, the women's family home, was owned by women, but built and maintained by men. A mother and her married daughters (or several married sisters) lived in the women's family home with their female children. They prepared food for their men and boys who worked and lived in the men's house, the Qasgiq. The qasgiq served both as the men's house and community center. Boys old enough to leave their mothers joined

male relatives in the qasgiq, where together they worked, ate, bathed, and slept. The older males taught younger ones how to be Yup'ik and Cup'ik men. Mothers and wives brought food and joined them in the evening for singing, dancing, and festive events.

Yup'ik and Cup'ik People



Tlingit Traditional Knowledge and Storytelling, A Tribal Perspective

Vivian Martindale, Atkábeen, M.A. Cross Cultural Studies

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

This introduction is written in the Tlingit language.

Tlingít Atkábeen yóo xat duwasáakw. Vivian Martindale yóo xat duwasáakw. Mitchell Prescott yóo duwasáakw ax eesh. Lorna Woods ka Kay Prescott yóo duwasaakw ax tláa. Howie Martindale yóo duwasáakw ax xúx. Binkley's dachxán áyá xat. Ax Saami yátx'i. Yeil naax has sitee ax yátx'i. Kaachxaana.áakw dax ax een.aa áyá. My Tlingit name is Atk' aheen—Faith.

Translation: My name is Vivian Martindale. My father's name is Mitchell Prescott. My mothers' names are Lorna Woods and Kay Prescott. My husband's name is Howie Martindale. I am a grandchild of the Binkleys. I am a child of the Saami. My children are from the Raven moiety. My family is from Wrangell.

In Indigenous cultures, one cannot separate the person from the community, which is why, in the Tlingit culture, it is important to first introduce yourself in relationship to places and people. I live in Southeastern Alaska where, on

most days, Raven pulls down the clouds in gray curtains towards the sea. It is in this place that I am physically and spiritually tied to people and customs; a place where spruce, cedar, and hemlock forests stand like guardians along the shoreline. It is here that our community is bound together like spruce roots reaching out through language, traditions, and stories.

Hoonah, Alaska, where I live, is the largest Native village in Southeast Alaska with a population of 800 people. For my family, as well as many Native families who reside here, much of our subsistence lifestyle is traditionally tied to Glacier Bay and the surrounding areas. Our community extends towards the ocean to Lituya Bay, and consists of Icy Strait, Excursion Inlet, and Glacier Bay. There is evidence that Tlingit people inhabited the area in and around Glacier Bay for over 9,000 years.

Glacier Bay is the ancestral home of four prominent clans: the Chookaneidí, Kaagwaantaan, T'akdeintaan, and the Wooshkeetaan. Through traditional knowledge, we learn how to protect our environment through mutual respect. Out of respect between man and nature, and from the concept of

balance, comes our inherent knowledge of how to treat our 'relatives.' We believe that everything contains a spirit, thus every aspect of nature is to be respected. The survival of future generations depends upon knowing our stories, as well as knowing how to fish and hunt.

A sense of balance is one of the most important aspects of both the Saami and the Tlingit cultures, as demonstrated through many generations of traditional stories.

While chaperoning a group of Hoonah elementary students on a boat trip in Glacier Bay National Park, I was fortunate to hear the story of Kaasteen from the story's tradition-bearer. As the story goes, in the Glacier Bay, an advancing glacier overcame Kaasteen and her community because she was disrespectful to the glacier. The spiritual aspect of the story moved both the children and adults. From this story, we learn how important it is to respect the land and one another. This story, and other traditional stories, are just as relevant today as they were many years ago because they teach us about respect, sharing, and working together in order to survive.



Yukon Traditional Knowledge and Storytelling, Food for Thought

E. Barrie Kavasch,

Adapted from "Native American Foods and Festivals for Every Season," Enduring Harvest

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The following [summarized] story was shared at the Yukon International Storytelling Festival, Summer Solstice. Enjoy this story as food for thought, as well as the delicious recipe for Willow-Grilled Arctic Char with Wild Mushrooms.

Communities of three cultures live in timeless harmony across the stunning environments near the Yukon River. The Gwich'in of the boreal forest and Inuvialuit of the open tundra are joined by other Canadians and many visitors at the edge of the treeline, where beluga whales frequent the waters of the MacKenzie estuary near Herschel Island. Each June, near the summer solstice, the First Nations Peoples gather to celebrate their culture and traditions over three days of festivities filled with social and cultural events, entertainment, foods, and storytelling.

The special gatherings and celebrations of the Yukon villages are savory, multisensory experiences. Many are drawn to the delectable regional foods of grayling, Alaska King Crab, Yukon and Taku River Salmon, Arctic Char, caribou, and musk ox. Young fireweed

shoots, fresh raspberries, mossberries, dewberries, wild strawberries, and bearberries are assembled into delicious salads, along with the young leaves of mountain avens and arctic willow. Tombstone Mountain teas are blends of raspberry leaves, Labrador tea leaves and

blossoms, and Arctic willow shoots. Subsistence hunting, fishing, and trapping continue to sustain Yukon's First Nations Peoples through their profound understanding of this land and how to live on it.

Willow-Grilled Arctic Char with Wild Mushrooms

The Arctic char (*Salvelinus alpinus*) is a silvery fish with blue-green backs flecked with pink specks. However, the migratory fish undergoes a glorious transformation when it enters northern rivers to spawn. At that time, its colors flush and deepen to bright orange and reddish hues. Yukon People treat this succulent, meaty fish like salmon, as it is excellent grilled over dry alder and willow stems, brushed with a light vinegar and oil dressing and spicy hazelnut oil.

Ingredients:

- ▶ 2 to 3 cups of alder and willow stems and bark, dampened
- ▶ 1/2 cup hazelnut or walnut oil
- ▶ 1/4 cup apple cider vinegar
- ▶ 1 tablespoon diced onion
- ▶ dash of salt and pepper to taste
- ▶ 1 (5 pound) Arctic char fillet
- ▶ 6 small white onions
- ▶ 12 medium young mushroom caps

Gather fresh willow or alder withes (stems) to skewer small onions and mushroom caps. Prepare the campfire or grill by building a fine bed of coals. Spread the alder and willow pieces over the prepared coals and place the grill about 6 inches above the coals. Lightly oil the grill with a small amount of hazelnut or walnut oil. Combine in a small saucepan the 1/2 cup of oil, the vinegar, the onion, and salt and pepper. Warm over medium heat at the edge of the grill. Place the Arctic char fillet in the center of the grill, skin side down, and brush top well with the warm grill sauce. Quickly skewer alternately the onions and mushroom caps on the fresh willow stems. Place these beside the char fillet. Brush well with the same sauce.

Grill the fillet for 5 to 10 minutes on each side, turning once and brushing often with the sauce. Check and turn the vegetable more often to grill evenly. Grill lightly, do not overcook. Serve on a bed of steaming wild rice and hazelnuts.

(serves 6)

The Status of Alaska Native Tribes, A Tribal Perspective

*Heather R. Kendall Miller, Tribal Member, Curyung Tribal Council
(formerly the Native Village of Dillingham)*

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Alaska is an expansive land of approximately 586,000 square miles. It is occupied by 229 federally recognized Tribes, nearly half the total number of federally recognized tribes in the United States. The Indian, Eskimo, and Aleut Tribes of Alaska share a history unique from most other Native American Tribes. Unlike their neighbors to the South, they were never militarily conquered by the United States, nor did they ever declare war. With a few exceptions, they were never engaged in hostilities with non-Native settlers. Alaska Tribes never signed (nor were they forced to sign) treaties or treaty-substitutes ceding to the federal government territory or other rights. For the most part, they were never removed from their ancestral lands and herded into reservations, either to make lands available to others or to break up their traditional life ways. These differences in treatment were a product of Alaska's remoteness and the slow progression of non-Natives into the Alaska territory in the late 19th century.

For much of the treaty-making period between the federal government and Lower

48 tribes, Alaska was owned by Russia, not the United States. When the United States purchased Alaska from Russia in 1867, aboriginal use and occupancy was simply noted, reserved and expressly left unaddressed for future action. Alaska tribes were nonetheless deemed to fall under the same legal regime applicable to all other Native American Tribes. Article III of the 1867 Treaty of Cession stated: "The uncivilized tribes will be subject to such laws and regulations as the

United States may, from time to time, adopt in regard to aboriginal tribes of that country."

That provision has long been held to apply the whole body of federal Indian and statutory law to the "uncivilized tribes of Alaska." While Congress's Indian policies of the late 19th and early 20th centuries were generally extended to Alaska Natives, aboriginal land claims remained unaddressed. Only in the 1960's, when Alaska tribes were finally met with a common



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threat to their lands, did it become necessary for Congress to comprehensively address aboriginal land holdings.

The 1958 Statehood Act had granted Alaska the right to select some 103 million acres. With Alaska about to select their best lands and with lucrative oil leases being let, not by the aboriginal owners but by the state government (purporting to hold good title by virtue of its selections), the threat to Native lands was real and immediate. The resulting confrontation led to history's largest settlement of American aboriginal land claims.

The Alaska Native Claims Settlement Act (ANCSA) reserved to Alaska Natives full title to over 44 million acres (including former reservations), it extinguished aboriginal title to all other ceded lands, it placed those lands in the public domain, and it paid the Alaska Natives \$962.5 million. Under ANCSA, the lands and settlement funds would be held by newly created Native owned and Native-controlled profit-corporations. ANCSA established 13 regional profit-corporations which received (based on a population formula) 16 million acres of surface land and the subsurface rights to another 22 million acres of village land. In addition, each village tribe was required to establish a corporation under state law to "hold" the lands (the surface estate to 22 million acres) and act "for and on behalf of" the village.

Importantly, ANCSA left in place the Federal Government's trust responsibility by preserving Alaska Natives' eligibil-

ity to receive all the Federal Government's Indian trust services, a provision which guarantees for Alaska tribes precisely the same trust services that the BIA, Indian Health Service (IHS) and other federal agencies provide to lower 48 tribes in Indian country.

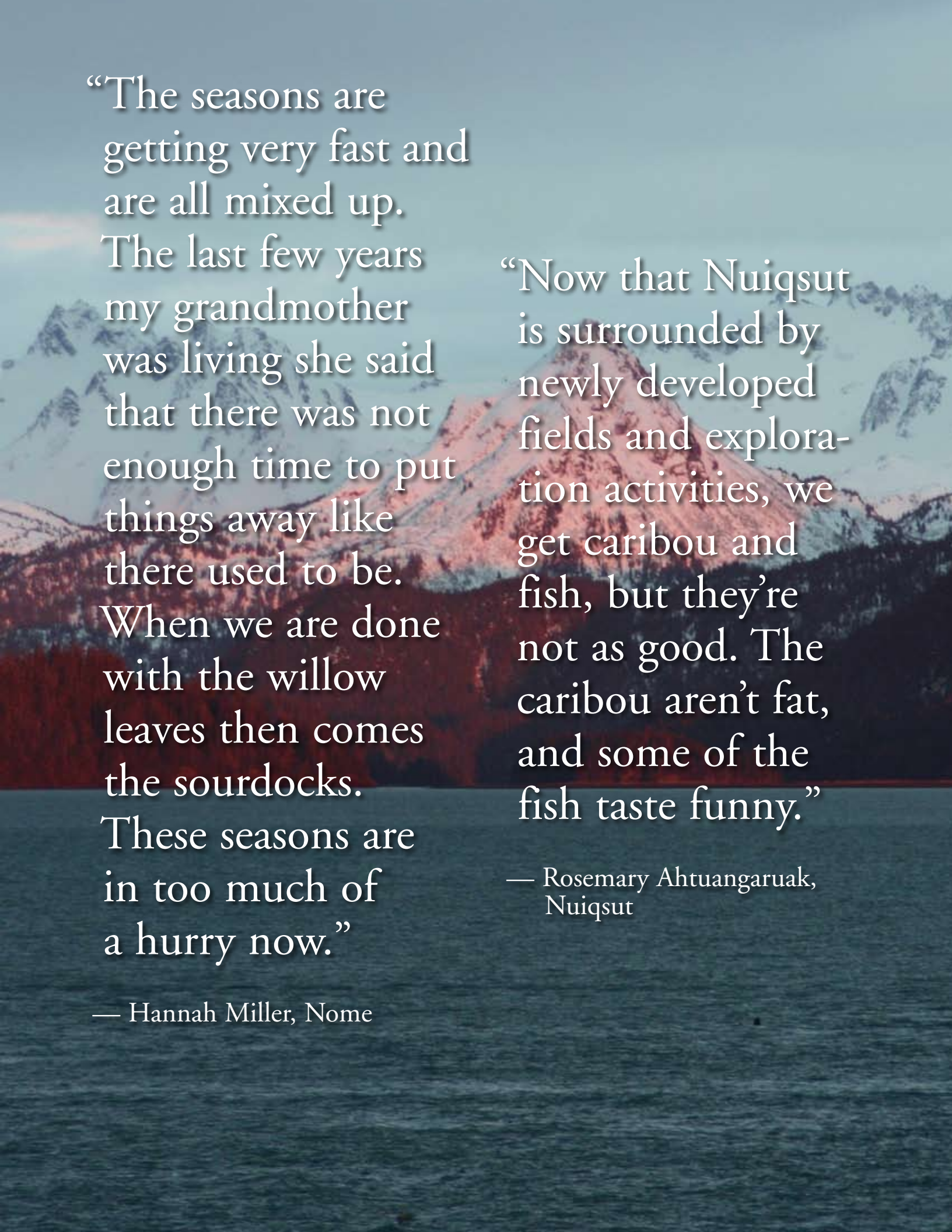
As implementation of the Settlement Act began to wind down in the 1980's, for many tribal villages disillusionment began to set in. For a number of reasons, the ANCSA corporations had not proven to be the promised powerful engines for rural economic development. Tribal governments were desperate to achieve the same relative security in their land rights, hunting and fishing rights, and local governance rights as enjoyed by tribes elsewhere. These issues were brought to the courts as Alaska's tribes sought to defend their immunities and enforce their governmental powers. The resulting litigation produced a succession of decisions that have delineated the rights and powers of tribes in Alaska.

The most significant case involved the Venetie Tribe. In the early 1980's, Venetie adopted a tribal tax on a non-Native company doing business on tribal lands. The land had been a former reservation that was revoked by Congress in ANCSA and re-conveyed to the newly formed ANCSA village corporations. The Venetie shareholders dissolved their village corporations and voted to transfer the former reservation land back to the tribe in fee. The Venetie Tribe asserted its jurisdiction over the non-Native business

on the basis that it continued to occupy Indian country since ANCSA neither spoke to or extinguished existing Indian country in Alaska. The Supreme Court disagreed and interpreted ANCSA as Congressional intent to extinguish Venetie's former status as Indian country when it revoked the Venetie reservation's trust status and conveyed it to the village corporations in fee. The Court further held that in the absence of Indian country, Alaska tribes lack the authority to regulate the activities of non-Natives.

Although the Supreme Court's Venetie decision severely cut back on tribal territorial jurisdiction in Alaska, Alaska Tribes continue to possess inherent jurisdiction over tribal members, regardless of whether the members reside in the respective tribal community or live within or out of Indian country. Other cases firmly established that Alaska tribes have the same governmental status as other federally acknowledged Indian tribes by virtue of their status as Indian tribes with a government-to-government relationship with the United States. Alaska tribes are thus entitled to the same protection, immunities, and privileges as other acknowledged tribes, and have the right, subject to general principles of federal Indian law, to exercise the same inherent and delegated authorities available to other tribes; and, are subject to the same limitations imposed by law on other tribes.



A scenic landscape featuring snow-capped mountains in the background and a body of water in the foreground. The sky is a pale, hazy blue. The text is overlaid on the left side of the image.

“The seasons are getting very fast and are all mixed up. The last few years my grandmother was living she said that there was not enough time to put things away like there used to be. When we are done with the willow leaves then comes the sourdocks. These seasons are in too much of a hurry now.”

— Hannah Miller, Nome

“Now that Nuiqsut is surrounded by newly developed fields and exploration activities, we get caribou and fish, but they’re not as good. The caribou aren’t fat, and some of the fish taste funny.”

— Rosemary Ahtuanguaruak,
Nuiqsut

Journey to Alaska

Journey to Alaska

On April 13, 2005, the OPPTS Tribal News staff headed to Anchorage, Alaska, to gather information for this unprecedented issue. The staff's goal was to hear first-hand environmental issues common to Alaska Natives and see first-hand how traditional lifeways and cultures are being affected by these issues. This article provides a summary of their research.

During the trip, staff visited Anchorage, Homer, Sitka, Ketchikan, Nanwalek, and Kenai. The group also spent time at the Alaska Native Heritage Center in Anchorage and the Alaska Wildlife Center in Ketchikan.

A Look at Nanwalek, Alaska

The Tribal member population in Nanwalek is 303. Their population has almost doubled within the last several years. Formally, the Natives of Nanwalek are referred to as Sugpiaq Nanwalek (or Real People from the Place with the Lagoon).

The Native Village of Nanwalek has several administrative programs and staff to ensure a healthy and economically supported community for its members, including an Administrative Office, Community Health Representative, the Indian Child Welfare Act (ICWA) Program, Natural Resources and Fisheries, Alcohol Prevention Program, a Health Clinic and Diabetes Center, and the Indian Environmental General Assistance

Program (GAP)/Environmental Education.

Due to their vulnerable location, residents of Nanwalek are extremely sensitive to environmental changes affecting the Kenai Peninsula. Most Community Members are concerned with runoff from their local landfill/open dump, pollution from cruise ships, battery disposal from buoys in the peninsula, global warming, and dust.

Nanwalek's landfill/open dump

Interview with Emilie Swenning, Chief of the Nanwalek IRA Council

Emilie expressed her deep concern about her people in the Native Village of Nanwalek and the state of their current environment. One of her main concerns is the growing population since the community is just over 300 people with several new ones on the way. The land base is approximately 8 square miles and 2 square miles of water. One of the most immediate environmental problems is the village open dump. It has no liner, and some of the residents, while trying to improve their village life, still do not dispose of their trash in the right receptacles. Also, since the dump is open and has no liner, waste leaches into the ground and travels in the small stream down into the outlet. When there is sufficient wind, some of the trash is even blown throughout the village.

Chief Swenning also feels that the climate changes and oil industry, as well as the impact resulting from the 1989 Valdez spill, have had great ramifications in their physical environment. Many familiar foods from the sea are not as common as they once were as the seals and sea otters are not coming to their waters since certain fish stocks have decreased since the spill. Also, they have witnessed warmer winters, a growing season of larger insects, and larger leaf growths on their trees.

Emilie recounted and emphasized that ultimately the youth of the Village will have to learn that soon it is going to be their turn to manage their lives and to resolve the problems of the Village. In conclusion, Emilie said that this beautiful village could benefit greatly not only from financial assistance and from economic development, but also from some technical assistance and guidance that could enable them to adapt to their growth and changing environment.

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commenced operation in the early-to-mid 1980's. The landfill/open dump was constructed by the Kenai Peninsula Borough and serves as the dump site for all waste from the village, with the exception of recyclable materials sent off-site to Homer by plane. There are other materials stored nearby which are sorted and classified as hazardous and non-hazardous. The biggest issue is that the open dump is only a "stones' throw" from many homes. Also, the resulting runoff is discharged into the Kachemak Bay without being treated or managed prior to release. In an effort to address some of these issues, the village will implement a process for separating wastes and will use incineration as a means of waste management when possible. The village is also researching the idea of incorporating pre-scheduled, regular pick-ups of local community waste to ensure proper disposal.

When considering climate change, the residents notice larger and an increased number of insects, unpredictable weather changes, a decreased number of seals and fish, warmer water temperatures, more tree moss, and enlarged plant leaves.

Dust and poor indoor air quality are state-wide problems. The local airplane landing strip is made with loose gravel, and take-offs and landings present a huge problem since the strip is only 100 feet from homes. The community hopes to purchase calcium chloride in the near future to apply to the graveled area to reduce the dust and airborne particles.

Residents also are concerned with the inevitable growing pains and space issues resulting from their quickly increasing population. Evident growing pains include less space for residents and housing, issues with the local economy, increased pollution, and an insufficient drinking water supply. The Community hopes to develop additional corporation land located within a few miles in order to alleviate these growing pains.

Thoughts of Nanwalek Residents



"There is hope for improvements within the community and more opportunities for the kids of

tional programs, a decrease in the growing populations that may result in better sustaining the new land area, and continuing cultural and traditional lifeways. I hope to keep the past with the future."

Natalie Kvasnikoff

"I call myself a "Chief-in-Training" because I'm learning cultural and traditional lifeways, including traditional hunting and gathering, cooking and meal preparation, and language, from many of the tribal elders. I teach the native language to the youth of the community because it is rapidly decreasing. English is my second language. Also, I am currently developing a native-tongue booklet of nursery rhymes.

Besides our language, plants and wildlife are extremely important to our community. I teach and practice the use of medicinal plants, as well as sea otter pelts when making traditional clothing.

There have been a lot of changes from the natural environment that used to be here. Most of the changes were seen after the oil spill. I was extremely frightened at that time and fear that it may happen again in the future. After the spill, residents spent countless days cleaning oil from the ducks, fish, other wildlife, and natural foods. My goal is to maintain their beautiful land while keeping things pristine and clean."

Rhoda Moonin



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Journey to Alaska

Interview with Rita Smagge, Executive Director, Kenaitze Indian Tribe

Like many Tribal leaders, Rita is very concerned about the environmental changes that are impacting the ways of life of her Tribe. She is concerned that climate change may contribute to decreased snowfall. She recalled years, for example, of blizzards and snow almost up to the roof tops. There also has been an increase in insect activity.

Rita is very concerned about the crowding that takes place every year at the Kenai River. Historically, the biggest fish, known as the King Salmon, attracts fisherman and sportsman from all over the world. Many people come to fish the river because the Kenai River Kings are some of the largest in the world. However, the River is becoming overfished and the pollution from hydrocarbons being released into the water from motorboats is becoming apparent. Also, due to the increasing tourism and trade, many parks and recreation areas are overwhelming the area. Her concerns also stem from continued oil and gas development in Cook Inlet that may ultimately affect other water bodies such as the Kenai River. Lastly, due to unpaved roads, four wheeler dust is a constant problem with the glacier silt blowing throughout the area. The health and well-being of the tribal members at risk for diabetes, asthma, and stress-related diseases is increasing. There are mold and indoor air pollution related problems as well.

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Athabascan Values and the Kenaitze Indian Tribe Mission Statement

Athabascan Values

- ▶ Self-sufficiency
- ▶ Hard Work
- ▶ Caring and Providing For Family
- ▶ Family Relations
- ▶ Unity
- ▶ Humor
- ▶ Honesty/Fairness
- ▶ Sharing/Caring
- ▶ Village Cooperation
- ▶ Responsibility to Village
- ▶ Respect for Elders and Others
- ▶ Respect for Knowledge
- ▶ Wisdom from Life Experiences
- ▶ Respect for the Land
- ▶ Respect for Nature
- ▶ Practicing Native Traditions
- ▶ Honoring Ancestors
- ▶ Spirituality

Mission Statement

It is the mission of the Kenaitze Indian Tribe to foster the governmental, social, cultural, and economic well-

being of its members and their families. This shall be accomplished by administering programs and activities that empower its members to participate to the maximum extent-thereby ensuring Tribal self-determination. Self-determination shall be accomplished primarily through education and organization of council, management, and members. The Kenaitze shall strive for maximum effectiveness in carrying out its mission.

To the greatest extent possible, the Kenaitze Indian Tribe shall engage in activities that complement its strengths. The Tribe shall be aware of its weaknesses, how to minimize them, and focus on learning, working, and choosing projects with a long-term view that will provide for Tribal growth and perpetuity.





A Look at Kenai, Alaska

The Tribal member enrollment for the Kenaitze Indian Tribe is 1,200. Formerly, the members of the Kenaitze Indian Village were referred to as the Dena'ina Indians.

The Kenaitze Indian Village has several administrative programs and staff to ensure a healthy and economically viable community including an Administrative Office, Environmental Protection Program, Science Camp Program, Housing Assistance Program, Social Services (e.g., tribal court, general and energy assistance), Culture and Education Program (includes scholarships, training, vocational, native language, youth activities, Youth Olympics team, culture, and recreation), Health and Dental Clinics (include drug and alcohol abuse prevention programs and diabetes awareness), and Fisheries and Education.

Interview with Brenda Trefon, Tribal Environmental Protection Officer

Brenda serves in the Environment Department. She has developed an extensive environmental educational program for tribal youth that includes a summer camp. She has developed a wide variety of different activities for the children that include many cultural elements of the Tribe and the surrounding environment such as the Dena'ina Plants coloring book and the Nature Journal. Brenda has also worked on the many other important environmental activities for the Tribe such as their Recycling Program and provides tips on how to handle the different wastes. She also helps administer various grant programs, such as the General Assistance grant (GAP) and the EPA Watershed Protection Grant, (to protect the Kenai River from pollution caused by outboard motors). More recently, the Tribe has received a grant from the US Department of Energy for a Tribal Renewable Energy Feasibility Study. This project has set up a wind tower to measure wind speed and a device that will measure solar energy.

One of the most promising things that Brenda has observed is the excitement and energy of the Tribal youth. These Tribal youth have a desire to learn about their traditional knowledge and cultural practices such as hunting and gathering. This is especially noteworthy as the Tribe is located in an area that has increasing population of mainly non Natives. Many of the tribal members are employed outside Kenai. Therefore, maintaining and learning cultural customs of the Tribe is critical to maintaining their identity for the future.

One of the challenges the Tribe faces is the uprooting and destruction of native plants due to population growth and urban sprawl. Brenda recounted a story where one culturally important species of plant was actually bulldozed by mistake while putting in a roadway to a housing development. This type of plant generally likes certain growing areas and not others sites. Therefore, this makes this species less available for harvesting by the tribal members.

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Journey to Alaska

Kenaitze

The Kenaitze Indian Tribe has implemented several successful programs to support their tribal members in the areas of physical and mental health, education, youth services, and housing.

Kenaitze Health Clinic

From the Kenaitze tribe's belief that "Preservation of health is a commitment to the preservation of culture: safeguarding our health safeguards our culture," the Kenaitze Dena'ina Health Clinic staff support the tribe's health, dental, and urgent care needs. The health clinic staff, which consists of approximately 20 tribal members, encourages honest and open discussion with tribal patients in order to foster functional relationships between the patients and health care providers. The health clinic thrives on its working relationships with other Kenaitze programs such as the Head Start, Nakenu, and Elders programs.

The Kenaitze Dena'ina Health Clinic offers support in a range of common health care services including diagnosis and treatment, prescriptions, lab work, x-rays, and referral services. The health clinic also provides dedicated resources to assist with pediatric care, diabetes and nutrition, cardiac care, and endocrinology.

The Dental Clinic offers comprehensive care to tribal members with an emphasis on prevention concurrent with the objectives of the Healthy People 2010 Initiative. The Dental Clinic provides care for a range of common dental services, including checkups with x-rays and exams, routine cleanings, fillings, emergency treatment, and other specialty treatments as needed.

Kenaitze Cuya Qyut`anen Head Start

The Kenaitze Cuya Qyut`anen Head Start works in partnership with the community and parents for the benefit of tribal youngsters and their families. The Head Start program involves elders and community leaders, social services, and medical providers to ensure children are given the best services the community has to offer. The Head Start program also relies on parent participation to provide guidance and support of local operations, help in curriculum development, and sustain cultural practices and beliefs. With the help of the local tribal community and parents of students, the Kenaitze Cuya Qyut`anen Head Start program hopes to achieve the following goals:

- ▶ *Goals in Child Development*
- ▶ Education & literacy
- ▶ Health - including physical, dental, mental health screenings, and education
- ▶ Nutrition – breakfast and lunch are provided
- ▶ Individualized education plan for each child
- ▶ Transitions into and out of the program
- ▶ Transportation available to most areas
- ▶ Children with special needs are identified and referred for special services in collaboration with Head Start.
- ▶ *Goals in Family Development*
- ▶ Family support services/home visits
- ▶ Support toward families' personal goals
- ▶ Family involvement in planning program goals and objectives
- ▶ Parent education on a variety of topics selected by parents
- ▶ Family dinners
- ▶ Counseling referrals.

Kenaitze Salamatof Housing Program

The Kenaitze Indian Tribe and the Salamatof Tribal Council, two local federally recognized tribal authorities, combined in 1998 to form the Kenaitze/Salamatof Tribal Designated Housing Entity. The goal of this partnership is to provide safe, secure and affordable housing to meet the needs of the low and moderate income Alaska Native/American Indian families residing in the Kenaitze/Salamatof jurisdictional area.

The partnership oversees several programs including weatherization, modernization, homeownership, and mold and ventilation, and provides financial support for Kenaitze Indian Tribe's Emergency Housing Assistance and Student Housing Assistance Programs. For over three years, the Kenaitze Salamatof Housing Entity also has provided homes to eligible tribal residents through a program titled "Rent to Own." This program allows qualified participants to rent a new or existing home for a pre-determined amount of time and then purchase it.

Nanwalek

The Nanwalek Indian Village offers its tribal members extensive support in the areas of education, physical and mental health, alcohol-prevention, diabetes prevention, housing, and environmental health. Specifically, the tribe sponsors the following programs and initiatives:

- ▶ *Social Programs:* Indian Child Welfare Act, Community Health Representative Services
- ▶ *Cultural-Environmental Programs:* Traditional Ecological Knowledge program
- ▶ *Community Development:* Water services, Environmental program, Youth Activities



program, Education program, Head Start program, Salmon Enhancement project.

Nanwalek Environmental Program

The Nanwalek Environmental Program, led by a small group of tribal members, focuses on improvements in waste management, safe drinking water, air pollution and indoor/outdoor air quality, and environmental education. With the assistance of funds from the Indian Environmental General Assistance Program, the program provides training for local community volunteers, researches innovative technologies to control dust accumulation from the tribe's gravel air-landing strip, promotes recycling and smart waste management, and purchases computer equipment and educational supplies for the Nanwalek community.

Nanwalek Education and Head Start Programs

The Nanwalek Education and Head Start Programs utilize volunteers from the local community to incorporate cultural and social-based education into its every-day curriculum. Students are taught the native language of the Sugpiaq and Alutiiq natives, as well as story-telling. The Nanwalek Indian Village received grant funding from the U.S. Office of Juvenile Justice and Delinquency Prevention in 2005 to implement its New Direction program. The Nanwalek New Direction program will provide prevention activities for the youth of Nanwalek who have been identified as at-risk for delinquent behavior. This project will include alcohol and drug abuse prevention programs and services, and drug and/or alcohol education. The

targeted group is 12-17 years of age and of Sugpiaq/Alutiiq descent. The approximate number of youth involved will be 35 in the first year and 19 more in the subsequent two years of the grant. The Council will use these funds provided by the U.S. Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention to operate a year round after school prevention program which will provide safe, educational, and fun activities for the youth. For more information, contact the Nanwalek Head Start Program at 907-281-2323.

Nanwalek Health Clinic

The Nanwalek Health Clinic specializes in health education and prevention programs, as well as physical health care services for its tribal members. Focusing on the

Nanwalek youths is a top priority for the village. Health clinic programs, including alcohol and diabetes prevention, highlight the importance of prevention and education. Other common services supported by the Nanwalek Health Clinic include diagnosis and treatment of children and adults, prescriptions, lab work, x-rays, referral services, and diabetes and nutrition-based education. For more information, contact the Nanwalek Health Clinic at 907.281.2251.

It is the mission of Kenaitze Salamatof Housing to provide housing opportunities and other assistance for low and moderate income tribal members and all Alaska Natives and American Indians within the jurisdiction of the Kenaitze Indian Tribe and the Native Village of Salamat.

ALASKAN POPULATION !

*Census results for year 2000 shown in map
 **Forty-one percent of the population resides in Anchorage, and 79% of the population resides in the six largest census areas: Anchorage, Fairbanks, the Kenai Peninsula, Ketchikan, the Matanuska-Susitna Borough, and Juneau
 Source: State of Alaska, Department of Commerce, Community, and Economic Development, www.commerce.state.ak.us/home.htm

LEGEND

Population
0-1,000
1,001-2,500
2,501-5,000
5,001-7,500
7,501-10,000
10,001-20,000
20,001-30,000
30,001-50,000
50,001-250,000
250,001-500,000



ALASKA SALMON HARVEST STATISTICS

SPECIES	NUMBER	WEIGHT
2000 Total	137,573,826	712,083,412
1995 Total	217,795,000	994,141,000
1990 Total	155,058,000	691,626,000
1985 Total	146,358,000	669,736,000
1980 Total	109,991,000	511,373,000
1975 Total	26,237,000	139,765,000
1970 Total	68,364,000	347,241,000

Source: Alaska Department of Fish and Game, Alaska Commercial Salmon Harvests, 1970-2004, www.cf.adfg.state.ak.us

COMMUNITY	POPULATION, BY YEAR			
	2000	1990	1980	1970
Aleutians East Borough	2,697	2,464	1,643	n/a
Anchorage	260,283	226,338	174,431	124,542
Bristol Bay Borough	1,258	1,410	1,094	1,147
Cordova-Valdez	6,490	6,178	4,958	2,169
Dillingham	2,466	2,017	1,563	914
Fairbanks (city)	30,224	30,843	22,645	14,771
Fairbanks North Star Borough	82,840	77,720	53,983	45,864
Haines Borough	2,392	2,117	1,680	1,504
Juneau	30,711	26,751	19,528	13,556
Homer	3,946	3,660	2,209	1,083
Kenai Peninsula Borough	60,579	50,789	31,815	18,866
Ketchikan	7,922	8,263	7,198	6,994
Ketchikan Gateway Borough	14,070	13,828	11,316	10,041
Kobuk	109	69	62	54
Kodiak-Kodiak Island Borough	20,247	19,674	14,695	13,207
Matanuska-Susitna Borough	59,322	39,683	17,816	6,509
Nome	3,505	3,500	2,544	2,488
North Slope Borough	7,385	5,979	4,199	2,663
Sitka	8,835	8,588	7,803	6,109
Skagway-Yakutat-Angoon	2,242	1,864	1,728	1,265
Total	698,606	611,254	437,473	310,586

ALASKA LANGUAGE STATISTICS

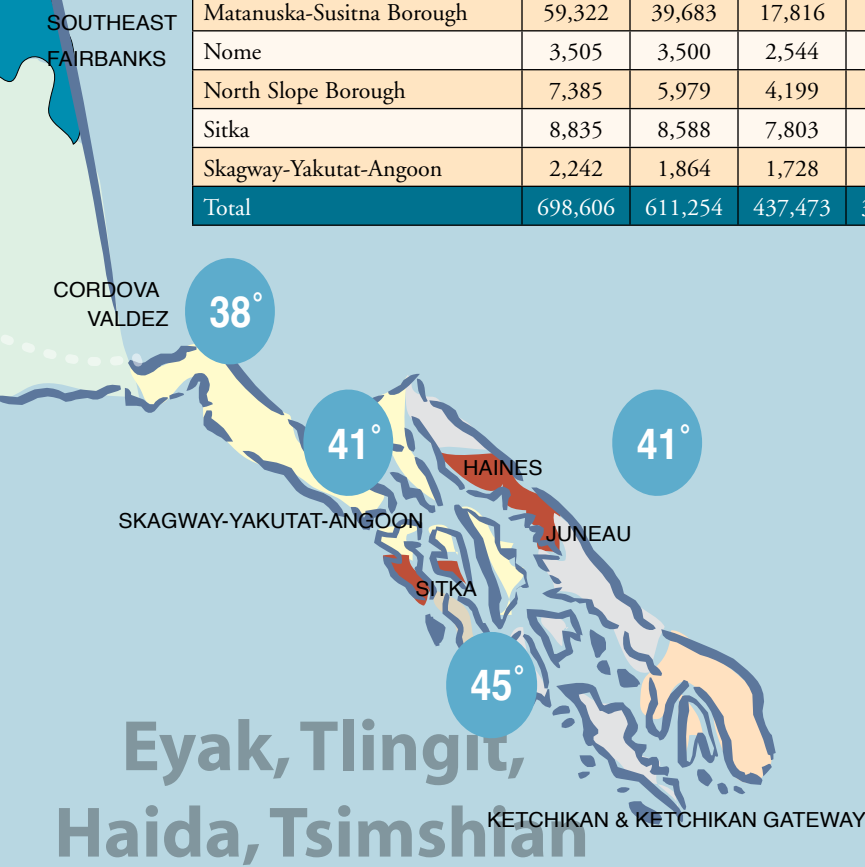
Language Family*	Population	Speakers
Eskimo-Aleut	40,600	14,705
Tsimshianic	< 1,400	< 80
Haida	600	15
Athabaskan-Eyak-Tlingit	16,425	1,570

*Data reported in 1997

**Excludes populations in Russia, Greenland, and Canada originally listed in source

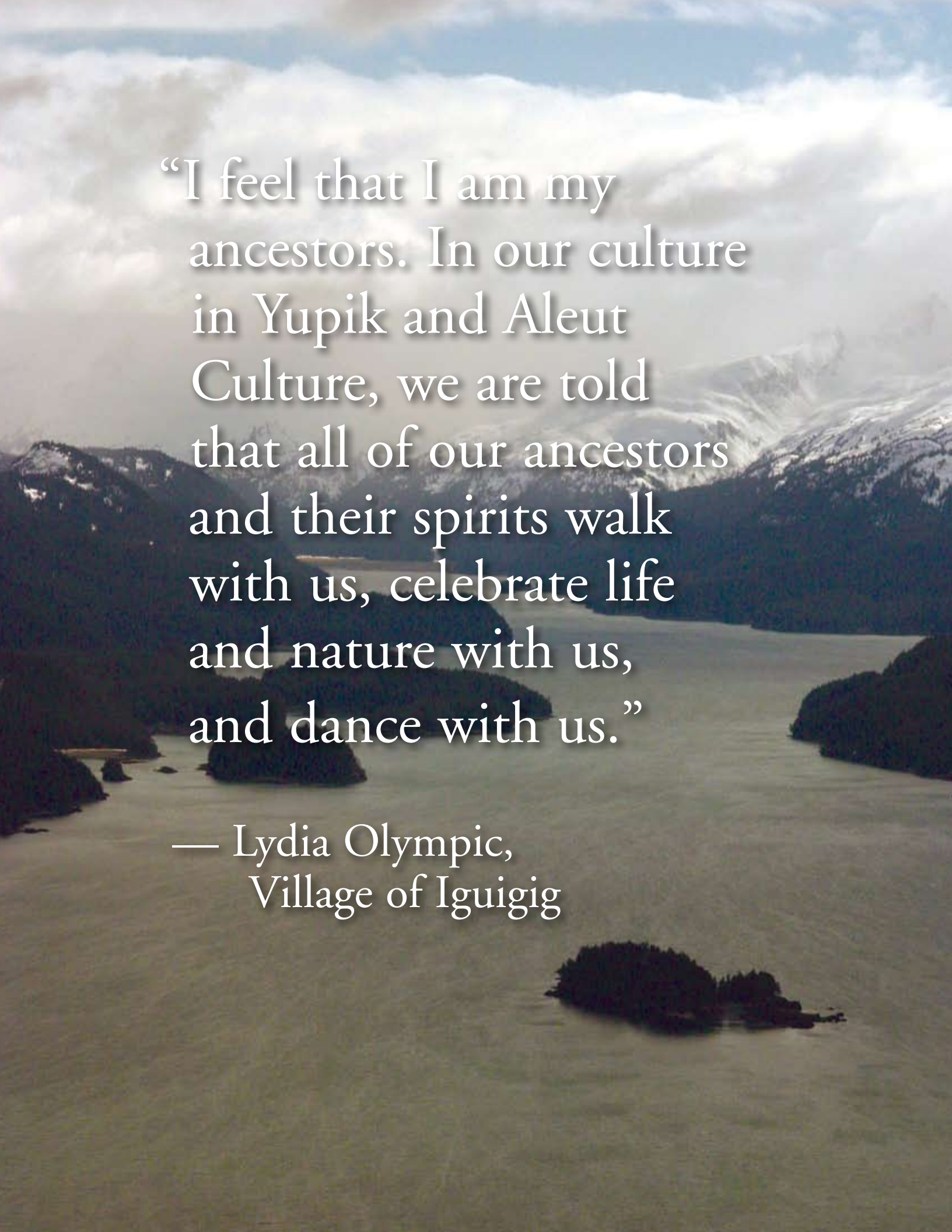
Sources: Alaska Native Language Center, University of Alaska Fairbanks, Box 757680, Fairbanks, AK 99775, (907) 474-7874, (907) 474-6586 (fax), fyanlp@uaf.edu.

Michael E. Krauss (1997). *The indigenous languages of the north: A report on their present state. Northern Minority Languages: Problems of Survival*, ed. by Hiroshi Shoji & Juha Janhunen, 1-34. (Senri Ethnological Studies 44.) Osaka, Japan: National Museum of Ethnology.



Eyak, Tlingit,
Haida, Tsimshian

45° Mean annual temperatures (°F) denoted in circles throughout Alaska map.



“I feel that I am my
ancestors. In our culture
in Yupik and Aleut
Culture, we are told
that all of our ancestors
and their spirits walk
with us, celebrate life
and nature with us,
and dance with us.”

— Lydia Olympic,
Village of Iguigig

Introduction to Science and Research in Alaska

Information adapted from several sources including EPA's Tribal Science Council Website and U.S. Fish and Wildlife Service Website

Over the last ten years, numerous science and research projects have been initiated to study Alaska's environment. While some of these projects have focused on Alaska's unique environment, others have examined health issues specific to Alaska's indigenous people. Currently, there is no single repository for information collected during all of the ongoing and/or completed research projects. However, there are efforts being conducted to compile this information. One such effort is the Arctic Health Website, in which researchers at the University of Alaska-Anchorage are compiling research information on Alaska natives. The project is being sponsored by the National Library of Medicine.

The vast majority of science and research projects on Alaska's environment are conducted utilizing mainstream ("Western Knowledge") approaches. However, in Alaska and elsewhere, there is a growing movement to supplement mainstream approaches with "Traditional Knowledge." In this publication, there are some examples of projects and activities that have used one or both of these approaches.

Western Approach

The western approach uses knowledge based on objective principals. This involves the systematic observation of, experiment with, and peer evaluation of the material and functions of the physical universe. Western science typically gains its knowledge through the work of expert scien-

tists trained in analyzing certain components of the whole physical universe. This knowledge is transmitted through written text.

Traditional Approach

The traditional approach uses the "accumulated knowledge" of indigenous people who have lived and thrived in their unique environments for thousands of years. Their knowledge is drawn from observations made on both the physical and spiritual aspects of the world, which are often viewed holistically. Most knowledge is accumulated and passed down from one generation to the next through various methods including oral tradition.

Towards Understanding Different Scientific Approaches

As the value of traditional knowledge becomes further recognized by mainstream researchers, the need to use it in the current western ecological and environmental health research becomes more apparent. There have been cases where environmental conservation and sustainability projects have realized more effective results when employing "traditional knowledge," than with a western approach. In order to completely understand and address the environmental

"Indigenous people have a historical relationship with their land and are generally the descendants of the original inhabitants of such lands. Indigenous people represent a significant parentage of the global population. Over the many generations, they have developed a holistic traditional scientific knowledge of their lands, natural resources, and environment."

quote taken from Agenda 21, Rio Conference

problems and health issues affecting Alaska, western science should begin to acknowledge and respect traditional knowledge before final scientific observations and conclusions are drawn. Both western and traditional approaches can aid in finding solutions to the public health and environment concerns facing Alaska and its indigenous people.

There is a single light of science, and to brighten it anywhere is to brighten it everywhere.

Isaac Asimov

Alaskan Coastal and Sea Mammal Research

There is a tremendous amount of research currently being conducted on the Alaskan Coastal system and sea mammals living in the Alaskan region. In addition to the NOAA marine mammal research discussed in an article in this issue, many government, academic, and private sector institutions are conducting important research. There are also many organizations that maintain research information portals and databases to link users to research programs and projects. This article contains brief summaries of only a small fraction of the current marine research programs and information databases pertaining to Alaskan coastal and sea mammal research.

The Alaska Department of Fish and Game The Arctic Marine Mammal Program

This program focuses on marine mammals living in the Bering, Chukchi, and Beaufort seas, especially those linked to Alaska Native subsistence users and the ecosystems of which they are an integral part. The program conducts research to understand the diets, foraging, habitat use, movements, basic population dynamics, and condition of marine mammals. Study subjects include ice seals, walrus, polar bears, and beluga and bowhead whales. This research also provides information needed to understand possible perturbations and disturbance from oil and gas development and interaction with fisheries. The following are examples of research currently being conducted within the program.

Ice Seal Biomonitoring: The

Arctic Marine Mammal Program is working with villages to collect samples from the subsistence seal harvest. Tissue samples and measurements from harvested seals are taken to evaluate indices of population status and health. Tissue samples are analyzed for, among other things, contaminants, diet, growth and condition, and genetics.

Bering Strait Environmental Observatory at Little Diomed: In collaboration with the University of Tennessee, the Arctic Marine Mammal Program is working to establish water sampling capabilities at Little Diomed in the Bering Strait Region for year-round oceanographic studies. Because local residents are almost entirely dependent upon subsistence food resources, it is very important to monitor changes that can have a major impact on their community. Of particular concern are changes in weather patterns, sea ice regimes, and biological cycles. This study also includes contributions from local hunters who provide marine mammal tissue for disease screening

and other analyses.

Bristol Bay Beluga Whale Project:

This project is a collaborative effort between the Arctic Marine Mammal Program and the Bristol Bay Native Association to track beluga whales. Satellite telemetry is being used to study beluga whale and salmon interactions in the Kvichak River system. Other partners in this study include the National Marine Fisheries Service, the Alaska Beluga Whale Committee, the U.S. Fish and Wildlife Service, and the National Park Service.

Stellar Sea Lion Program

The Stellar sea lion research program examines the steep and dramatic decline of the population of these mammals in Alaska. The program includes projects focused on population dynamics, animal movements and behavior, physiology and disease, genetics, and sea lion nutrition and condition. Samples collected from captured stellar seal lions throughout coastal Alaska are shared with over 40



John E. Sarvis, USFWS



David Menke, USFWS, Alaska Image Library



collaborators to conduct research on topics such as parasitology and virology, contaminants analyses, and predator-prey relationships.

Harbor Seal Program

This program monitors population trends of harbor seals in selected areas of Alaska. The goal of the research is to gain a better understanding of harbor sea ecology (e.g., diet, dive behavior and movements, and habitat use) and population dynamics (e.g., assessing survival and reproductive success through photo-identification of individuals and radio telemetry). Researchers compare health and condition parameters, diet, and diving data to identify factors that may contribute to the different regional population trends observed throughout Alaska.

For more information on these Alaska Department of Fish and

Game marine mammal programs, visit www.wildlife.alaska.gov/management/mm/mm_programs.cfm

Alaska SeaLife Center

The Alaska SeaLife Center is a marine facility that combines research with wildlife rehabilitation and public education. Research conducted at the Center aims to identify the reasons for ecological changes and declining marine populations. Marine mammals studied include the Stellar sea lion, Pacific harbor seal, and eider. For more information on research being conducted by the Alaska SeaLife Center, please visit www.alaskasealife.org

U.S. Geological Survey-Alaska Science Center

The mission of the USGS Alaska Science Center is to provide

leadership and accurate information to support sound decision-making regarding natural resources, natural hazards, and ecosystems in Alaska and circumpolar regions. The Center's Biological Science division conducts research on ecosystems and habitats, mammals, fish and fisheries, birds, and topics such as remote sensing, genetics, contaminants, and biometrics. Sea mammals studied at the center include walrus, polar bears, and sea otters. Walrus research projects include an abundance study and a genetics program. Sea otter projects being conducted at the Center include studies on sea otter population status and changes, examining oil spill effects on sea otters, and sea otter

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predators. For more information on research being conducted by the USGS Alaska Science Center, visit alaska.usgs.gov/science/biology/index.php

North Pacific Universities Marine Mammal Research Consortium

The mission of the North Pacific Universities Marine Mammal Research Consortium is research on the relationship between fisheries and marine mammals in the North Pacific Ocean and Eastern Bering Sea. The Consortium, formed in 1992, consists of the University of Alaska, the University of British Columbia, the University of Washington, and the University of Oregon. Federal and state governments, the fishing industry, private foundations, and coastal Alaskan communities provide funding for research conducted by the Consortium. A Scientific Advisory Committee, comprised of university, industry, and government agency representatives, oversees the Consortium's research program. Currently, the Consortium is conducting research on the Stellar sea lion and the Alaska killer whale.

Stellar Sea Lion Research: Consortium researchers are comparing the behaviors, diets, and movements of Stellar sea lions in Southeast Alaska, where the population is abundant, to those in the Western gulf, the area of the largest decline in population. The Stellar lion research projects involve gaining a better understanding of the mammal's nutritional needs; developing better techniques for studying the mammals in the wild; and conducting laboratory tests, data analyses, and computer simulations.

Alaska Killer Whale Research: Consortium researchers are studying the possible impact of killer whale predation on the declining populations of Stellar sea lions. This is a three-component study. The first component was a survey of mariners in the Gulf of Alaska and Aleutian Islands to identify areas of killer whale concentrations. The second component consists of field study for identifying individual killer whales and biopsy sample collection for genetic and dietary analysis to determine the proportion of killer whales feeding on marine mammals. The third component of the study involves a comparison of predation rates in the southeast and western regions of Alaska.

For more information on the Consortium and its marine mammal research, visit www.marinemammal.org/consort.php

National Science Foundation

The National Science Foundation (NSF) is an independent federal agency charged with promoting the progress of science and advancing national health, prosperity, and welfare, among other responsibilities. NSF supports and funds many research projects in the Alaska region including the Bering Ecosystem Study, supported by the NSF Office of Polar Programs.

Bering Ecosystem Study (BEST)

BEST is a major research effort to gain an understanding of and predict the impacts of climate change on the marine ecosystems of the eastern Bering Sea. Currently in its planning stage, the BEST program will involve the deployment of ships and long-term

instrument arrays, and satellite-based remote sensing studies. The grand scale of this undertaking will require collaborations with other national and international programs conducting similar investigations into the effects of climate change. The BEST Science Plan, published in October 2004, outlines the proposed studies. According to the plan, BEST will:

- Investigate connections between external forcing mechanisms and hydrographic structure and physical processes.
- Investigate the connection between physical aspects of the marine environment and the responses of the biota of the eastern Bering Sea.
- Develop tools for integrating the effects of climate change across spatial and temporal scales, with the goal of forecasting how the ecosystem might be expected to behave under different climate scenarios.

In addition to this natural science research program, the NSF Arctic Social Sciences program is supporting the development of a social sciences research plan to complement BEST. This research plan will focus on how humans use and organize themselves around the Bering Sea system. Still in draft form, the research program themes will attempt to prioritize the concerns, goals, and interests of long-time Bering Sea residents, including Alaska Native communities. The three broad themes of the research project, as of the fourth draft of the research plan published in September 2005, are:

- Impacts on humans: how past, current, and possible future changes in the Bering Sea ecosystem affect the health and well being of human communities living and depending on this



region for subsistence, employment, and cultural survival.

- ▶ Human impacts: how changing human uses of the Bering Sea region affect the natural cycles of this ecosystem by moderating and/or accelerating systemic changes.
- ▶ Dynamics of human and non-human natural systems: how the human environmental dynamic has changed through time and may change in the future due to internal and external opportunities and pressures.

For more information on the BEST projects, links to both the natural science plan and the social sciences research plan, and information on related programs of which BEST is a component, visit www.arcus.org/bering.

Study of the Northern Alaskan Coastal System (SNACS)

This NSF funded research program involves various research projects focused on the three elements of the coastal system, land, ocean, and atmosphere. Research project topics include bowhead whales, carbon interconnections, organic carbon's effect on eroding coastlines, halomethane gas exchange, synthesis and scaling (to study climate change), and the deposition and fate of mercury. For more information on SNACS and the aforementioned research projects, visit www.arcus.org/arcss/snacs/index.php

In addition to conducting research, there are many organizations dedicated to pulling together the work of different organizations to form collaborations. Two such organizations are the Alaska Native Science Commission and the North Pacific Marine Science Organization.

The Alaska Native Science Commission

The Alaska Native Science Commission (ANSC) provides information and referral and networking services for researchers seeking active partners in the Native community. Its mission is to “endorse and support scientific research that enhances and perpetuates Alaska Native cultures and ensures the protection of indigenous cultures and intellectual property.” ANSC also serves as a clearinghouse for proposed research, an information base for ongoing and past research, and an archive for significant research involving the Native community. The following are brief synopses of a few of the on-going research projects involving Native communities.

Collaborative Research: Holocene Climatic Variability in Southern Alaska – Quantitative Estimates of Temperature and Precipitation, Warm Intervals, and Possible Cyclicality

The focus of this NSF-funded collaborative research project is the reconstruction of winter precipitation in southern Alaska. Researchers identified lakes having exceptional promise for climatic reconstructions and will apply their expertise in paleoecologic and isotopic analyses, glacial-geological studies at proglacial lakes, GIS-based local climatic modeling and synoptic climatology to the reconstruction efforts. Communities chosen for these reconstruction projects are the Ahklun Mountains, Arolik Lake, Chugach Mountains, and the Kenai Peninsula.

Permafrost I: Alaska Transect Observations

This NSF-funded research project collects and logs data from 27 permafrost observatories located along the oil pipeline in the Prudhoe Bay community.

Temperatures are measured in drill holes of up to 80 meters in depth, in the active layer and in the near-surface permafrost. Researchers will use these data to make observations of the active layer, permafrost, and thermokarst conditions.

Integrated Assessment of the Impacts of Climate Variability on the Alaskan North Slope Coastal Region

The primary goal of this NSF-funded research project is to generate a range of scenarios for changing sea ice variability, extreme weather events, storm surges, flooding and coastal erosion, and other environmental factors that can be used to predict the probability of the development of weather conditions that could affect coastal communities. These scenarios can also be used in marine mammal management and surveys, and transportation and offshore resource development.

USGS/Earth Surface Dynamics Cryospheric Studies Project

This USGS-funded research project is being conducted in Alaska, Greenland, and Antarctica. The two distinct aspects of the project are:

- ▶ Department of Interior/ Global Terrestrial Network for Permafrost Observing Network: Includes the Global Terrestrial Network for Permafrost, which was established for detecting climate change, monitoring the response of permafrost to climate change, and for acquiring data for use in impact assessment models.
- ▶ Borehole

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Paleothermometry: a technique used to reconstruct past surface temperatures from physical temperatures measured within the Earth.

For more information on ANSC or the aforementioned research projects, visit the ANSC website, www.nativescience.org

North Pacific Marine Science Organization

The North Pacific Marine Science Organization (PICES) is an intergovernmental scientific organization whose current members are Canada, People's Republic of China, Japan, Republic of Korea, Russian Federation, and the United States. The organization's goal is to promote coordination of marine research and the collection and rapid exchange of scientific information. PICES, in partnership with NOAA, is developing the North Pacific Ecosystem Metadatabase (NPEM). The goal of this undertaking is to develop a "catalog" of the vast amounts of biological and physical data collected in the North Pacific ecosystem. NPEM is a clearinghouse for information about data, reports, databases, catalogs, proposals, and other media relating to the North Pacific Ocean. To learn more about the NPEM or conduct a search, visit www.pmel.noaa.gov/np/mdb/index.html.

For direct links to a wide array of research programs, including some mentioned in this article, visit The North Pacific Ocean Theme Page at www.pmel.noaa.gov/np/pages/prog.html.



The Alaska Traditional Diet Project

The mission of the Agency for Toxic Substances and Disease Registry (ATSDR) is to investigate and prevent human health problems associated with exposure to toxic chemicals in the environment. A key element of ATSDR's public health role is to provide trusted health information to prevent harmful exposures. Based out of Atlanta, Georgia, ATSDR conducts research and assessments to determine the presence and nature of health hazards in an effort to prevent or reduce exposure and illnesses resulting from such hazards.

This federal agency works very closely with state agencies and other partners, and provides funding and technical assistance to its partners through cooperative agreements and grants.

ATSDR activities in Alaska include public health assessments, health consultations, health education and community activities, and training. Many of the agency's activities in Alaska focus on the health of Alaska Native populations. One example of particular note is the Alaska Traditional Diet Project.

Persistent organic pollutants, heavy metals, and radionuclides have been found in Alaska, as well as other Arctic areas. A major concern is possible exposure to these contaminants through participating in a subsistence lifestyle, or through recreational and commercial exposures. In 2001, Congress mandated that ATSDR identify and study "contaminants in the environment, subsistence resources, and people in Alaska Native populations." The hope is that with more information about the risks from

exposure and the nutritional benefits of traditional foods, Alaskans can make informed choices regarding their diets. In response to the Congressional mandate, ATSDR formed an Alaskan Traditional Diet Project (ATDP) team. ATSDR, the Alaska Department of Health and Social Services, other state and federal agencies, Alaska Native organizations, and tribes collaborated on this project and provided funding to the Alaska Native Health Board (ANHB) to support surveys of the dietary habits of Alaskans who regularly eat traditional foods.

- The goals of the ATDP are to:
- ▶ Identify items in the traditional diets and market foods consumed
 - ▶ Determine the health risks and benefits of traditional versus market diets
 - ▶ Develop a shared knowledge (native knowledge and science) to assure appropriate levels of communication, education, training, and community outreach.

The first phase of the ATDP was to conduct a survey to identify the most commonly consumed subsistence and store bought foods among residents of villages in rural



Alaska and, therefore, help the villages in prioritizing foods to be tested for contaminants. In the summer of 2002, 665 participants completed the survey. Study participants ranged between the ages of 13 and 88 years, and represented 13 villages in five regional health corporations in Alaska: the Norton Sound Health Corporation region, the Yukon-Kuskokwim Health Corporation region, the Bristol Bay Area Health Corporation region, the Tanana Chiefs conference region, and the SouthEast Alaska Regional Health Consortium region.

The results of the survey data indicated that



47 percent of participants reported consuming the same amount of subsistence foods as they had five years ago, 27 percent reported consuming less, and 26 percent reported consuming more.

In addition to types and amounts of foods consumed, the survey also solicited the attitudes and concerns of participants regarding foods. The most common concerns regarding subsistence food reported by participants were observations of fish and animals with parasites, diseases, or lesions; reduced number of fish and animals; and the possible presence of contaminants in fish and animals. Although the survey results indicate that these fears have not

resulted in an avoidance of subsistence foods, the results do indicate that participants do have concerns regarding the health effects of consuming traditional subsistence foods.

The final report on the Alaska Traditional Diet Survey was published in March 2004 and is available online at www.inchr.org/Doc/February05/Final_aggregate_report.pdf. Along with complete survey results, this report provides references and links to other related subsistence food studies and community outreach materials.

The second phase of the ATDP, testing the highest priority foods, as determined by the survey data, is currently underway. Testing is being

conducted by a number of organizations for a variety of contaminants.

For more information about the Alaska Traditional Diet Project, visit www.atsdr.cdc.gov/alaska, or contact ATSDR Region 10 toll-free at 1-888-477-8737.

NOAA Marine Research Activities in Alaska

The National Oceanic and Atmospheric Administration (NOAA) is a federal agency within the U.S. Department of Commerce. NOAA's mission is to "describe and predict changes in the Earth's environment as well as to conserve and manage the nation's coastal and marine resources." Three of NOAA's divisions conduct research vital to the sustainability of Alaskan coastal ecosystems: Office of Oceanic and Atmospheric Research (OAR), National Ocean Service (NOS), and National Marine Fisheries Service (NMFS). This article will focus on NMFS and its research activities.

NMFS

The mission of NMFS is the "Stewardship of living marine resources through science-based conservation and management and the promotion of healthy ecosystems." NOAA fisheries are responsible for the management, conservation, and protection of living marine resources within the U.S. Exclusive Economic Zone.

Alaska Fisheries Science Center

The Alaska Fisheries Science Center is the research arm of the NMFS. The Center conducts research on living marine resources in a three million square mile region, which includes the North Pacific Ocean and the eastern Bering Sea. These waters support some of the most important commercial fisheries in the world and serve as the home to the largest marine mammal populations in the nation. The mission of the Center is to "plan, develop, and



USFWS, Alaska Image Library

manage scientific research programs which generate the best scientific data available for understanding, managing, and conserving the region's living marine resources and the environmental quality essential for their existence."

Research programs are managed and conducted through the Resource Assessment and Conservation Engineering Division, Resource Ecology and Fisheries Management Division, National Marine Mammal Laboratory, Auke Bay Laboratory, and Fisheries Management and Analysis Division. However, this article covers only

some of the research conducted by the National Marine Mammal Laboratory. For information on the Alaska Fisheries Science Center and links to the other research divisions, please visit www.afsc.noaa.gov.

National Marine Mammal Laboratory

The National Marine Mammal Laboratory (NMML) conducts extensive research on marine mammals off

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the coasts of Alaska, California, Oregon, and Washington. NMML's research programs are conducted in cooperation with other federal, state, and private sector agencies. Data collected during research activities such as stock assessments, life history determinations, and status and trends analyses are provided to various U.S. governmental and international organizations to help in the development of management regimes for marine resources under NOAA's jurisdiction. Major NMML programs currently conducting research in Alaska include: Alaska Ecosystems Research Program, Polar Ecosystems Program, and Cetacean Assessment & Ecology Program.

Alaska Ecosystems Research Program

The Alaska Ecosystems Program conducts research on northern fur seals and Stellar sea lions.

In collaboration with universities, research councils, and other partners, program researchers collect and analyze biological information regarding the stock structure, abundance, mortality rates due to human activities, net productivity, and survival and reproduction rates of these sea mammals. This information is used by numerous agencies in developing their management programs.

Northern Fur Seal Research

In collaboration with the University of Alaska Fairbanks and Dalhousie University in Nova Scotia, NMML scientists are investigating the consequences of northern fur seal foraging strategies at two locations in the Bering Sea, the Pribilof Islands and Bogoslof Island. These two locations are of particular interest to researchers due to the fact that the number of northern fur seals has declined dramatically on the Pribilof Islands,

while increasing on Bogoslof Island. This study involves the tracking of maternal fur seals from the islands during the winter and summer months and measuring their health and condition and subsequent pup growth rates. NMML is also conducting northern fur seal entanglement studies. For more information on northern fur seal research conducted by NMML, visit nmml.afsc.noaa.gov/AlaskaEcosystems/nfshome/nfs.htm

Stellar Sea Lion Telemetry Research

NMML's Alaska Ecosystem Program uses satellite telemetry to collect information on Stellar sea lion foraging ecology in an effort to relate foraging behaviors to the recent population declines. Researchers track the movements of individual adult females through satellite transmitters attached to the sea lions. Tracking provides information on the tagged Stellar sea



Sue Matthews, USFWS

Karen Boylan, USFWS,
Alaska Image Library



lions including their location, dive characteristics, and time on land and at sea. Visitors to the Telemetry Research Page can view the near real time movements of tagged Stellar sea lions as well as view location data from previous tracking efforts. For more information on NMML's Stellar sea lion telemetry research, visit www.afsc.noaa.gov/nmml.

Polar Ecosystems Program

The Polar Ecosystems Program conducts pinniped and seabird research to determine the primary factors influencing their population. Ongoing program research focuses on feeding ecology, reproductive success, growth and condition, demography, abundance, prey availability, and environmental conditions. Ongoing program research topics include Alaskan harbor seals and Arctic ice seals.

Alaska Harbor Seals Research

NMML's Polar Ecosystems Program conducts research on the population declines of the Alaska harbor seals. Research focuses on estimating the abundance and distribution of harbor seal populations throughout Alaska and studying the haulout behavior of

the seals. Research is also being conducted to assess the interactions between cruise ships and harbor seals in glacial ice habitats.

NMML has conducted a yearly census of harbor seals in Alaska for the last 15 years. To allow for more thorough coverage, the state has been divided into five survey regions: North side of the Alaska Peninsula including Bristol Bay, Aleutian Islands, Gulf of Alaska, northern SE Alaska, and southern SE Alaska. However, one census of the state takes five years to complete. Analysis of the survey data enables researchers to detect changes in declining/changing population. NMML's harbor seal research in Alaska is coordinated with the Alaska Department of Fish and Game. For more information on NMML's Alaskan harbor seal research, visit www.afsc.noaa.gov/nmml/polar/research.

Arctic Ice Seals Research

NMML is currently planning and developing research programs on the four species of Arctic ice seals that breed on Alaskan sea ice: ringed seals, bearded seals, spotted seals, and ribbon seals. Work is also being planned to assess the

reproductive and demographic status of ice seals taken in subsistence harvests by Alaska Natives. For more information on NMML's Arctic ice seal research, visit www.afsc.noaa.gov/nmml/polar.

Cetacean Assessment & Ecology Program

The NMML's Cetacean Assessment & Ecology Program (CAEP) monitors the status of cetacean species including bowhead, beluga, gray, killer, fin, northern light, and humpback whales and harbor and Dall's porpoises. Assessments are conducted through aerial surveys, shipboard research, shore-based counts, acoustic studies, tagging studies, photo-identification of individual animals, and opportunistic sighting data collection. Opportunistic data is collected through the Platforms of Opportunity Program, which allows everyday citizens to submit personal observations (such as location, size, and behavior) of their sightings of cetacean species for inclusion in the NMML's Platform of Opportunity database. This data is used to plan distribution and abundance surveys and document habitat use. For more information on the research activities of the CAEP, visit www.afsc.noaa.gov/nmml/cetacean/research.

Sea Gull Egg Contaminant Testing in Alaska

Adapted from “Sea Gull Egg Contaminant Testing in Alaska: Are my sea gull eggs safe to eat?”
Lianna Jack and Dan Martinez, TASSC

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

The Alaska Sea Otter and Steller Sea Lion Commission (TASSC), a non-profit Tribal consortium, received funding from the Environmental Protection Agency (EPA) to test a subsistence food for high priority contaminants.

TASSC worked with Sitka Tribe of Alaska, Native Village of Mekoryuk, Togiak Traditional Council, Maniilaq Association based in Kotzebue, and the Qawalangin Tribe of Unalaska.

Tribal participants raised concern with gull eggs, a common and prized subsistence food throughout coastal Alaska. In spring 2000, coordinators from each area collected 15 eggs for a total of 75 eggs sampled. The eggs were tested for Level One PBT contaminants (including pesticides, PCBs, dioxins, furans and heavy metals).

Results from this health risk analysis and other studies indicate that the contaminant levels found in the five community gull eggs should pose little risk to the health of those harvesting them for traditional use.

Methods

Eggs were collected from sites traditionally used for subsistence in each of the five areas. Three gull species were sampled:

- Glaucous gull (*Larus hyperboreus*): Triangle Island, Nunivak Island (Mekoryuk); Vitskari and Viesoki Rocks (Sitka)

- Glaucous-winged gull: (*L. glaucescens*): Egg Island, mouth of Noatak River (Kotzebue)
- Herring gull (*L. argentatus*): Hog Island (Unalaska); Gull Ship (Togiak).

For each community, aliquots of four randomly selected eggs were combined into a composite sample. Fifteen composite samples, representing 60 eggs, were sent to each laboratory for analysis: Frontier Laboratory for heavy metal analysis and AXYS for organochlorine pesticides, PCBs, dioxins and dioxin-like compounds.

Throughout the life of the project, tribal participants were kept apprised of the project stage and progress. Following completion of data analysis and health risk assessment as described below, the data were provided and presented to each of the participating communities. Many forms of outreach and communication were employed, including workshops, posters, community meetings, newsletters and presentations at statewide tribal/environmental conferences.

Analytical Data Results and Discussion

Percent detections were calculated and sums were compiled for PCBs and dioxins. For metals, selenium and mercury were detected in all samples, whereas arsenic, cadmium and lead were detected in only one or few samples. Therefore, only mercury and selenium could be used to compare among all communities. For organochlorines, contaminants were detected in 100-percent of

samples tested for toxaphene, hexachlorobenzene, beta-HCH, oxychlorodane, cis-chlordane, trans-nonachlor, cis-nonachlor, heptachlor p,p'-DDE, p,p'-DDT. Some organochlorines were not detected in any sample, and these included a-HCH, g-HCH, heptachlor, aldrin, endrin, trans-chlordane, p,p'-DDE, p,p'-DDD, and p,p'-DDT.

Conservative Approach at Health Risk

The contaminant results were analyzed for human health risk with the Agency of Toxic Substances and Disease Registry's (ATSDR) Minimum Risk Level (MRL) screening tool and EPA's Estimated Lifetime Cancer Risk (ELCR) assessment tool.

MRLs are designed to provide a very conservative measure of health risk and do not represent a cutoff for healthy vs. unhealthy contaminant levels. MRLs have a large margin of safety such that actual contaminant doses could exceed the MRL by a hundredfold or more without causing noticeable health effects.

TASSC used the chronic exposure MRL, as this mirrors egg consumption patterns over a lifetime to estimate non-cancerous health risk. World Health Organization Toxic Equivalency Factors were used to calculate total TEQ for dioxin and like substances. Total PCBs were calculated by PCB congeners.

Egg Consumption Guidelines (ECG) were developed as a component of the health risk assessment. The ECG incorporates the toxin's MRL, a range of bodyweights from 22 pounds to 320 pounds, the





concentration of the toxin, and various consumption rates. Using the ECGs, someone can quickly estimate the number of eggs eaten/year required to reach the chronic MRL for any contaminant of concern. Estimated Lifetime Cancer Risk (ELCR) was calculated using the EPA's Slope Factors for contaminants near or above the MRL and adjusting the formula to represent each community in the study.

Egg Consumption Guideline Results and Discussion

ECGs were created for those analytes with an established MRL. Most ECGs were far above what would be considered reasonable gull egg consumption (i.e., for toxaphene, 1260 eggs/year). However, for the highest concentration found for Total PCBs (450 ng/g), the ECG for a 143 lb person from Unalaska equates to 12 eggs per year. Based on the highest concentration of TEQ (16.6 TEQs), the Unalaska ECG for a 143-pound person equates to 16 eggs per year.

Since some people may exceed these levels, samples from Unalaska were analyzed using EPA's ELCR estimates. This method estimates that the potential for one person in Unalaska to contract cancer from the PCBs found in the gull eggs could be realized only if the average gull egg consumption for every person in Unalaska exceeded 101 eggs per year for 70 years. Cancer slope rates are developed for only one type of dioxin, HxCDD, hence cancer risk was much lower (greater than 3,700 eggs per person per year for 70 years). Based on these results, it is assumed that the contaminants found in gull eggs from the five communities pose little risk to human health.

Since the PCB concentrations were much higher in Unalaska than in the other communities, there was a concern that the composite sample concentration was not representative of the individual eggs. Eight individual eggs were analyzed for PCB congeners.

The results of this study were comparatively low when considered against those found in other studies.

Further, many of these studies considered less PCB congeners, fewer dioxins and their concentrations were up to seven times the TEQ concentrations and up to 58 times the total PCB concentration found in this study. Considering the results from the health risk analysis and the comparisons to other studies, the contaminant levels found in the five communities' gull eggs should pose little risk to the health of those harvesting them for traditional use.

Lianna Jack and Dan Martinez of TASSC coordinated this project. Donna Willoya, TASSC, provided support throughout the project, and Dr. Dolores Garza, University of Alaska, Fairbanks Marine Advisory Program, provided overall project oversight and served as Principle Investigator. For more information on this project, or to obtain the references from the original article printed in the Alaska Native Science Commission's newsletter, please contact:

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Tribal Natural Resource Contaminant Database Concept !

Fred Corey, Aroostock Band of Micmacs

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Tribal culture is inextricably rooted in the plant and animal communities that occur within each Tribe's homelands. As a result of this relationship between Tribal culture and natural resources, virtually all of the plants and animals that occur within each Tribe's geographic range are utilized for food, medicinal, or spiritual use. However, concerns about the uptake of contaminants by plants and animals have raised important questions about the safety of utilizing these resources.

Much of the recent attention focused on the safety of Tribal utilization of natural resources for food, medicine, and spiritual use has been prompted by well-publicized fish consumption advisories, recently collected marine mammal contaminant data, and press releases concerning a variety of organic pollutants in agricultural products. While there is a rapidly growing body of data on contaminants in animals, existing contaminant data for plants is relatively sparse. Due to the lack of existing plant contaminant data as compared to animal contaminant data, and because it is likely that a much greater number of plants species are utilized by Tribes in a given geographic area versus the number of animal species that are utilized, it is apparent that a thorough assessment of the occurrence of contaminants in plant species utilized by Tribes is a very

daunting task. The size of this task is compounded by the large number of contaminants of concern that could potentially be uptaken by each of the plant species utilized by Tribes.

One potentially rich source of existing plant contaminant data are the phytoremediation resources compiled by EPA's Office of Solid Waste and Emergency Response's (OSWER) Technology Innovation Office. EPA has developed the phytoremediation resources (www.epa.gov/tio/download/remed/phytoresgude.pdf) to demonstrate the capacity of various plant species to accumulate contaminants for the purposes of remediating contaminated sites. Although this effort has been targeted to identify plants that may be useful for extracting contaminants from polluted sites, the information that has been collected could be extremely useful for Tribes who are trying to identify which plants species utilized by their Tribe are capable of or are susceptible to accumulating contaminants.

Another source of plant contaminant data can be found in the Agency for Toxic Substances Disease Registry (ATSDR) Toxicological Profiles that are developed for hazardous substances (www.atsdr.cdc.gov/toxpro2.html). Although the toxicological profiles primarily review the key literature that describes hazardous substance toxicologic properties, other pertinent literature is presented as well, such as information on environmental fate, bioavailability, food chain bioaccumulation, and general information on exposure levels in environmental media.

In its present form, existing plant contaminant data is loosely organized as a series of literature citations and abstracts which are not conducive to quick and easy review. For the phytoremediation resources and other pertinent information to be most useful to Tribes who are concerned about contaminants in plant species, an on-line searchable database of plant species and the contaminants they are capable of uptaking could be established. Tribes could then query the database using the plant species or plant families that are the most important resources utilized by their Tribe. Queries could be further refined by specifying a particular contaminant(s) of concern that is known or suspected to be present on or near Tribal lands.

When combined with a general knowledge of the local sources of contaminants (i.e., discharges to water from industrial facilities, air emissions, contaminants known to be present from long-range air deposition, or spills or releases at industrial facilities), and general fate and transport mechanisms for each contaminant, it would be relatively easy for Tribes to quickly determine which plant species that they use are susceptible to contaminant accumulation, or those plant species for which no contaminant uptake information exists. This would then enable Tribes to focus plant sampling and chemical analysis on those plants that are likely to uptake contaminants or those for which no uptake information exists but are located in geographic areas with elevated contaminant concentrations.



A general example of how such an on-line searchable database might be structured can be found at: www.epa.gov/ecotox/. Although this particular database has been developed to provide a searchable source of information regarding chemicals and ecological risk, the format of the database demonstrates an example of how a searchable database of plant contaminant data could be constructed.

Developing such a database for use by Tribes would provide a valuable tool for Tribal environmental programs to begin to assess contaminant levels in culturally important natural resources and would not compromise Tribal confidentiality concerns because each Tribe would be able to query the

database using Tribal specific lists of plants utilized by their particular Tribe. Eventually, such a database could be modified to incorporate animal species and other plant species as additional research data becomes available. In addition, factors which are determinant of contaminant bioavailability such as pH, soil organic matter content, oxidation state, etc., and plant and animal uptake ratios observed under various environmental conditions could be added to the database to further enable Tribal scientists to identify species and contaminants occurring on their reservations that constitute the greatest concern.

If it appears that there is general support by Tribes for development of a national Tribal natural resource

contaminant database, the Tribal-EPA Subsistence Technical Workgroup could recommend that EPA explore development of such a database. Please direct questions, comments, or suggestions concerning potential development of a Tribal natural resources contaminant database to:

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The Northern Contaminants Program

(a Canadian effort)

The Northern Contaminants Program (NCP) was established in 1991 in response to studies indicating the presence of contaminants in northern ecosystems. Persistent organic pollutants (POPs), heavy metals, and radionuclides are the three main contaminant groups of concern. NCP is managed by the Indian and Northern Affairs Canada in partnership with other Canadian federal departments, the Yukon, Northwest Territories and Nunavut governments, and four northern aboriginal organizations: Council of Yukon First Nations, Dene Nation, Inuit Tapiriit Kanatami, and Inuit Circumpolar Conference. The aim of the NCP is to “work towards reducing and, where possible, eliminating contaminants in traditionally harvested country food, while providing information that assists individuals and communities in making informed decisions about food use.” Although NCP is a Canadian program, its research is beneficial and applicable to all people living in the Arctic region.

Phase II of the NCP (1998 to 2003) placed emphasis on “expanding research on the implications (benefits and risks) of consuming traditional/country foods for human health; developing effective community communication; and, continuing to work on international agreements to restrict contaminants.”

The Canadian Arctic Contaminants Assessment Report (CACAR) – Phase II is a series of reports that summarize the work conducted during Phase II of the NCP. One of five reports in the CACAR-II series is the Highlights of the Canadian Arctic Contaminants Assessment Report – Phase II. This report provides plain language

results of work conducted to address: contaminant sources, transport, and levels in the north; fish and wildlife contamination; the effects of contaminants on human health; education, training, capacity building, and communication; and, action at the national and international levels. The Highlights of the CACAR-Phase II report also provides recommendations on each of those issues. The following are the recommendations on the issue of the effect of contaminants on human health:

- More research is needed on the health consequences of not consuming traditional/country foods.
 - The risks of taking in higher levels of mercury need to be studied further.
 - Regular monitoring of contaminants in humans, especially mercury and various POPs (e.g., PCBs, chlordane, and toxaphene), should continue to give a better idea of whether levels are increasing or decreasing and provide a better picture of intake levels, regional variations, and trends.
 - It is important to continue monitoring the consumption patterns of traditional/country foods in those communities consuming the most traditional/country food containing contaminants.
 - More human health research should focus on the toxic effects of contaminants on northern peoples, and if and how contaminants are related to health problems.
 - A controlled human study of the effects of various nutrients such as certain fatty acids, selenium, and vitamin E on methylmercury would be useful to confirm the results of animal experiments.
- NCP research relating to human health should be published in the peer-reviewed literature and evaluated to see how it affects the present provisional tolerable daily intake (TDI).
 - More research is needed on how various types of toxaphene bioaccumulate and behave in animals including people, to shed light on the potential effects of toxaphene and to assess safe intake levels.
 - More research is needed on how the levels and effects of chlordane on animals can be related to effects in people.
 - New ways to predict health effects should be explored in the ongoing Nunavik study as well as in other studies elsewhere in the circumpolar Arctic.
 - More work is needed on the effect of mixtures of POPs on human health, especially on the fetus, infants, and children.
 - Conduct further research on the perceptions and understanding of risk among different northern groups (e.g., women of child-bearing age) to better tailor benefit-risk messages and communicate risk management options.
 - Written benefit-risk materials should take into account different dialects.

Highlights of the Canadian Arctic Contaminants Assessment Report – Phase II was published under the authority of the Minister of Indian Affairs and Northern Development in Ottawa, Canada. For more information, please visit www.ainc-inac.gc.ca, or call 1-800-567-9604.



EPA Science Research in Alaska

EPA's Office of Research and Development's STAR grants program supports two tribally-based research projects in Alaska that employ traditional and nontraditional scientific approaches to collecting baseline data that links culture and exposure pathways to contaminants. These studies are an important step toward building Tribal capacity to conduct large-scale community-driven exposure, epidemiology, and intervention studies that consider the economic and cultural needs and traditions of their communities. The focus and goals of these two projects are summarized below

"Environmental Contaminants in Foodstuffs of Siberian Yu'piks from St. Lawrence Island, Alaska"

The Siberian Yu'pik people of St. Lawrence Island, Alaska have relatively high serum levels of Polychlorinated Biphenyls (PCBs) and pesticides. Alaska Community Action on Toxics, in partnership with researchers at the State University of New York at Albany, are collecting and analyzing multiple whale, walrus, seal, and reindeer tissues, including muscle, blubber, and organ samples for congener-specific measurements of PCBs and levels of pesticides and metals. The research team expects to demonstrate higher levels of contaminants in some foods, particularly those that come from more contaminated areas. The researchers are also considering how food preparation may alter contaminant

levels. This information will be critical to helping community members make choices about what they eat so that they may reduce their exposure to environmental contaminants.

"Risks to Northern Alaskan Inupiat: Assessing Potential Effects of Oil Contamination on Subsistence Lifestyles, Health, and Nutrition"

Inupiat leaders of the Northern Slope, in partnership with researchers of the Mote Marine Laboratory, are characterizing levels of Polycyclic Aromatic Hydrocarbons (PAHs) in a range of traditional foods from bowhead whales and bearded seals. The research team intends to use the published results of this study to develop a risk assessment model incorporating both health risks associated with ingestion of petroleum-related compounds and cultural and nutritional risks related to avoidance of certain foods. The unusual

combination of traditional knowledge, powerful scientific analyses, and integrative modeling will permit the development of outreach tools and messages that empower Alaskan Inupiat with insights and information to guide their decisions in reducing risk from PAH exposure while maintaining good nutrition and health.

These Alaskan Native projects represent EPA's first efforts to systematically incorporate cultural practices of sequestration, consumption, and use of foodstuffs in conducting research. The researchers have quantified contaminant sources, identified unique exposure pathways, and conducted dietary and cultural surveys. They are currently translating the analytical chemistry data on foodstuffs and environmental media for tribally-based risk assessments and will link sources to pre-existing biological data. The results will lead to the development of risk management strategies that identify the healthiest ways to practice and maintain the cultural and traditional lifestyles of Native Alaskan communities.



The Arctic Climate Impact Assessment !

The *Arctic Climate Impact Assessment* (ACIA) is a comprehensive evaluation of arctic climate change and its implications for the Arctic region and the entire world. It is the compilation of the work of hundreds of international scientists and researchers. The ACIA is a project of the Arctic Council and the International Arctic Science Committee (IASC). The Arctic Council's members include Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States. IASC is a non-governmental organization that facilitates arctic region research collaborations. The ACIA Secretariat is located in the International Arctic Research Center at the University of Alaska, Fairbanks. According to the Council, the goal of the ACIA project is to evaluate and synthesize knowledge on climate variability, climate change, and increased ultraviolet radiation and their consequences. The aim is "to provide useful and reliable information to the governments, organizations, and peoples of the Arctic on policy options to meet such changes."

Impacts of a Warming Arctic is a plain language synthesis of the key findings of the ACIA. The 10 key findings of the ACIA discussed in the synthesis document are:

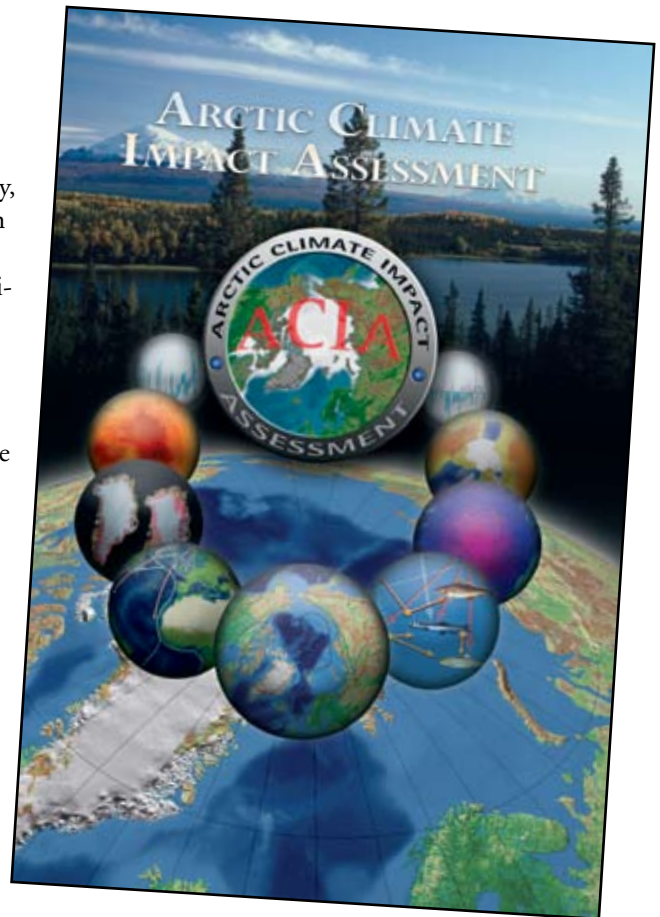
1. Arctic climate is now warming rapidly and much larger changes are projected.
2. Arctic warming and its consequences have worldwide implications.
3. Arctic vegetation zones are very likely to shift, causing wide-ranging impacts.

4. Animal species' diversity, ranges, and distribution will change.
5. Many coastal communities and facilities face increasing exposure to storms.
6. Reduced sea ice is very likely to increase marine transport and access to resources.
7. Thawing ground will disrupt transportation, buildings, and other infrastructure.
8. Indigenous communities are facing major economic and cultural impacts.
9. Elevated ultraviolet radiation levels will affect people, plants, and animals.
10. Multiple influences interact to cause impacts to people and ecosystems.

The synthesis document also presents scientific findings by Arctic sub-regions. Alaska falls into Sub-Region III, which also includes Chukotka, Western Canadian Arctic and adjacent seas. Key environment impacts faced in Sub-Region III are forest changes, adverse impacts (e.g., population reductions) to marine species, and risks to biodiversity. Key economic impacts are likely to be realized in the oil and gas industry and in fisheries. Key social and cultural impacts are risks to traditional livelihoods and threats to coastal infrastructure. Discussions on the key findings and impacts, as well as supporting evidence, are contained

in the synthesis document. A more comprehensive, detailed discussion of the key findings and supporting evidence can be found in the ACIA.

Copies of the full 1,042-page ACIA scientific report and *Impacts of a Warming Arctic*, the 140-page synthesis report of the ACIA, are available free of charge as PDF downloads at www.amap.no/acia/index.html. Hard copies may be purchased from the Cambridge University Press. For more information on the ACIA, visit www.acia.uaf.edu, or contact the ACIA Secretariat at 907.474.5818.



Considerations for Researchers in Alaska

Steven E. Sumida, Director, Alaska Indigenous Community Council

Byline articles and interviews represent the opinions and views of contributors and are not necessarily those of the U.S. Environmental Protection Agency.

Alaska Natives have long been the subjects of research, often without the benefit of being effectively informed of the research protocols and the study conclusions and results. Global warming has contributed to increasing the research being conducted on Alaska Natives.

It is well recognized that climate change is occurring most rapidly in the arctic. Changes are so pronounced that even a casual observer on the North Slope of Alaska cannot escape the signs.

The ice on the Arctic Ocean is becoming thinner every year, with less of the deep blue multi-year ice. This has resulted in fewer occurrences of pressure ridge piling where the pack ice meets the shore fast ice. This has had many consequences. There is less predictable stable ice to support hunting; recently there have been more instances of hunters blown adrift from the stable ice. It has been more difficult to find stable ice on which to land spring whales.

There has been much more ice-free open water both earlier and later in the season. This also has had many consequences. Storm surges and waves have been more pronounced. Massive flooding and erosion has resulted all along the arctic coast, which threatens roads, buildings, landfills, water supplies, communications towers, and subsistence camps. Open water has made fall whaling much more danger-

ous and has caused the swamping of whaling boats in two different communities in the last few years. Spring ice leads are opening and whale migrations are now occurring a month earlier than even two years ago. The Seattle barging season has expanded by a month longer than even five years ago. Barge traffic between Barrow through the Canadian Arctic up the Mackenzie River has recently become viable. Perhaps most astounding, a French sailing ship has come through the Northwest Passage without icebreaker support at least twice in the last five years.

There have been numerous onshore indications of significant warming. The oil exploration season on the frozen tundra has decreased by 30 days in the last five years. Tundra shrubs have significantly increased in height as far north as Nuiqsut. The Meade River ice is going out earlier and is ice damming in new locations. Ice cellars are being lost in Anaktuvuk Pass and are flooding in Barrow. Animal ranges are changing with moose, lynx and grizzlies appearing farther north and closer to Barrow and Kaktovik every year. Caribou migration routes, like beluga whale migration routes, appear to be changing.

There are also numerous changes in the weather. Wind patterns are shifting and changing directions more frequently. There are fewer winter days in which the temperature drops below minus 30 degrees. Lightening and thunder have been seen and heard recently in Barrow for the first time in living memory.

The Arctic has long been the

focus of climate research dating back at least to the era of Sir John Franklin and the search for the Northwest Passage. This research has continued through periods of intense scrutiny on indigenous residents including the International Polar Year studies of 1882-1883 and 1932-1933, cold war Eskimo metabolism studies of the 1950's, International Geophysical year studies of 1957-1958, International Biological Program studies in 1965-1968, and current arctic climate studies, many of which are rooted in the energy-based environmental studies of the 1970's. Today, the field has been greatly complicated with the addition of demographers, social scientists, cultural anthropologists, and climate change researchers being incorporated into a political game of assessing climate change blame on industrialization or nature.

Alaska Natives have a wealth of traditional environmental knowledge that can provide depth and quantification to these and other indicia of severe climate change. This has resulted in a rush by western scientists and researchers to extract this knowledge from the indigenous people without effectively communicating the scope and results of the studies back to the communities. The communication failure is in part a failure to recognize and respect systemic differences in Native subsistence systems from western cultural and economic systems. Western researchers, who do

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not understand the subsistence culture, cannot understand the degree of fear and uncertainty that poor communication can foster when subsistence resources are at risk.

This in itself is a miscommunication. As one elder said, “Last year you came to study mercury in our fish, and at that time we did not know it was a problem, but after that we worried for a year. Now you come to tell us not to worry.”

This is a common problem in the villages. Researchers need to be more aware of the stress their presence in the villages causes, and have a better understanding of how to communicate with the villages to reduce the level of stress.

Research on subsistence resource contamination, in particular, has the ability to create stress in Alaska subsistence-based cultures. This is because subsistence-related activities form the basis of the economic, political, and cultural structure of the community. Subsistence in Alaska Native culture can be described as ‘respect-based sharing.’ In Native Communities, sharing of subsistence resources is a way to show respect for others and gains respect for the person who shares the resource. The respect gained in this manner is recognized in other contexts. People whose actions in a community demonstrate skill and adherence to subsistence values become respected and recognized as leaders. When talking about leaders in Native communities, the term ‘respected’ is used more often to describe a leader than terms like ‘elected’ or ‘appointed’ because leadership is a quality that comes from within, and is recognized in a community regardless of whether or not a person holds public office. These recognized leaders are often invited to serve in particular

offices, but their authority comes from their personal characteristics of respect gained in subsistence cultural activities, not from holding that particular political office.

Contamination of subsistence resources can result in termination of subsistence activities. Termination of subsistence activities through which respect is established can disrupt the way the community orders its political and social structure.

This is the basis for the level of stress felt when researchers fail to appropriately share information regarding the research they are conducting on subsistence resources.

Almost every rural Alaska community has a story about panic due to outsiders mishandling information about threats to the subsistence resources. Two examples follow: In the 1950’s, researchers studying radioactive fallout concluded that Eskimos living in Anaktuvuk Pass had the highest levels of strontium 90 measured in North American people. Poor communication of the implications of those findings almost caused the residents to abandon the community and to stop eating traditional foods.

In the wake of the Exxon Valdez oil spill, Alaska Natives were told the fish were okay if they did not look or smell like oil, while commercial fisheries were closed, causing distrust and the perception of a double standard for Alaska Natives that exists to this day.

Lack of understanding of native culture has also resulted in a callous disregard for subsistence exposure pathways. One example is the indigenous attempts to get contaminant regulations to recognize that exposure can occur through indigenous diets of subsistence foods not

consumed in Western cultures.

Where there is no plan to report research results back to indigenous people, there is less need to find solutions that benefit the indigenous people.

The history of research in Alaska villages has been of researchers extracting data without engaging in effective communication and without ever effectively returning a benefit to the community.

Alaska Natives are, understandably, becoming weary of this course of dealing. Many Alaska Natives, particularly the elders, are not fluent in English. Furthermore, in the Native culture, many important lessons are conveyed through stories or demonstrative means, rather than through the Western method of ‘verbal communication of a set of instructions.’ In Alaska Native culture, communications relate more to another’s perceptions or feelings about circumstances than an instruction about what one person wants another to perform. Rarely are these cultural differences in communication recognized by researchers who tend to communicate with Native communities in technical jargon that few outside the researchers profession would understand, even in Anchorage.

In the past, communication was judged successful if the researcher was successful in recovering the desired data. It is time to recognize that successful research must result in effective communication with the indigenous community. Effective communication is facilitated by recognizing different cultural communication paradigms.

Strategies for Effective Communication.

The following strategies assume that the researcher is familiar with the Tribe’s government to govern-



ment relations protocol, its own agency protocols, the applicable Institutional Review Board (IRB) human research protocols, relevant rural Alaska protocols such as those provided by the Alaska Native Science Commission, the Alaska Native Tribal Health Consortium and the regional Native non-profit organizations. This also assumes that the researcher is familiar with basic Alaska village protocol such as obtaining an invitation to the community, respect for elders, and distinctions between the sovereign Tribal Council and ANCSA corporations, and municipalities.

The following points focus on strategies to enhance the effectiveness of communications:

- The goal of communication should include understanding by the recipient, not merely the collection of data by the researcher.
- In a perfect communication the following would be accomplished: Technical jargon would be translated into plain English. This non-technical version would be translated into the indigenous language, which may be communicated utilizing a demonstrative example or related in a story. A culturally effective communication describes the circumstances so that the listener can evaluate the point and determine an outcome from the perspective chosen by the listener, not one dictated by the speaker. An effective way to do this is for the researcher to fully brief a tribal leader or interpreter rather than utilize a native liaison.
- Research goes through a number of stages. At each stage, the process or the results must be reported back to the community. It is important to

maintain communication with the community throughout the process, to the point of providing the research conclusions.

There are a few common-sense communication procedures that can enhance effectiveness of communications at various stages:

- **Preparing for the Community Visit:** Ensure that you are familiar with both community protocols, and have inquired with regional Native organizations into the proper regional cultural customs and protocols. Develop a personal relationship with the community before a research visit. Learn who are the proper village contacts for your research topic, and upon whom the village relies to help organize the technical information that will be shared. Organize information and have it sent to the community before a visit. An ideal model is to format the information into the following three documents that address village protocol issues:
 - **Tribal Leader letter:** This is addressed to the president/chief of the Tribal Council through the Executive Director (or their equivalent positions). This letter should explain who you are, what you are doing, and why it is important to the community. It should also name your most significant contact in the community so that the tribal leader knows what local person to talk to in order to find out about you and your purposes in the community. It is disrespectful to enter a community without informing the leaders in advance, and receiving an invitation to visit the community.
 - **Fact Sheet:** This should summa-

rize all the important issues raised in the community by your presence and research. For each issue, there should be a contact person and direct-line phone number. It should also reference who in the community has been the point person for your contacts in this matter. This will give you and the technical people in the community a ready pipeline to be made aware of communications problems and to address them as they arise.

Poster: This should be on 8.5 inch-by-11 inch paper so it can be easily included in tribal council packets and posted on crowded message boards. A dominant feature should be a graphical reference to the topic of concern such as a diagram, symbol or picture. It should also invite the public to your meeting, identify the issue, and who will be talking about it. These help get the message to those who need it, the people in the village, and it covers the obligation of the researcher to communicate with all people without going around village protocol.

- **The Community Visit:** When invited to the community, be prepared to fully discuss the issue with the community representatives prior to presenting information to the community. This will give your contact the chance to think about what you will say before interpreting the infor-

Science & Research

mation. Fully brief the interpreter. Always include the tribal council in the advance communications and community visit protocols. Plan on staying over night. Be prepared to be flexible for additional one on one meetings with community members who have no apparent formal position of authority. Look for opportunities to participate in community-wide meetings.

- ▶ **Commitment to Ongoing Communication:** native villages digest information through informal community communications. This will be occurring before and after the village visit. It is important for the researcher to keep in close communication with

the village primary contact in order to keep the pulse of this information-digesting process and to address any rumors and misinterpretations. This prevents a lot of stress that can develop in a community even after what may have been felt was an effective community meeting. Native communities do not resolve new issues on the spot as the result of a lecture. They will pass the information around informally for a time. This is an important stage for the researcher to monitor, clarify and contribute.

- ▶ **Returning Results:** Researchers spend hours perfecting their peer reviewed documents for publication. Yet, they often fail to return the information in a useful form

to the people who were kind enough to allow them access to their homes, their lives, and often their bodies for research.

It is important that the circle is completed and that the researcher returns the information to the community. The information should be in a form that is useful and culturally accessible to the tribe. Simple examples would be a plain English summary sent to the tribe followed up with a personal visit by the researcher to the council and the community contact to present the research results and answer questions.



POPs and the Stockholm Convention

Chris Blunck, OPPT

Persistent Organic Pollutants (POPs) are a set of toxic chemicals that can persist in the environment for long periods of time, accumulate in the food chain, and travel great distances in air and water. They can cause an array of adverse effects in humans and animals including cancer, damage to the central and peripheral nervous systems, reproductive disorders, and disruption of the immune system.

To address this concern internationally, the United Nations Environment Program sponsored negotiation for a global treaty, known as the Stockholm Convention on Persistent Organic Pollutants. One hundred twenty countries participated in the negotiations, including the United States. The Stockholm Convention targets 12 POPs including certain pesticides, industrial chemicals, and unintended by-products of combustion such as DDT, PCBs, and dioxin. It is intended to eliminate or restrict the production, use, and/or release of these 12 chemicals that, due to their persistence in the environment, can affect human health throughout the globe, regardless of the location of their use. The Convention obligates all participating countries to take measures to eliminate or restrict the



production, use, and trade of intentionally produced POPs; to develop action plans that address the release of by-product POPs such as using best available techniques to reduce emissions of POPs from new sources; and, to address the safe handling and disposal of POP stockpiles and wastes. Provisions in the agreement allow for the consideration and addition of additional POPs, where appropriate, based on a scientific review of the proposed additional substances.

In May 2001, then EPA Administrator Christine Todd Whitman led the U.S. delegation to the diplomatic conference in Stockholm, Sweden, where representatives of over 90 countries signed the treaty. President Bush sent the treaty to the U.S. Senate for its advice and consent to ratification in April 2002. The Stockholm agreement went in force in May 2004, with the first Conference of Parties meeting in May 2005.

Although the United States has not yet ratified the Convention, the Administration continues to work with Congress on developing legislation that would allow the United States to implement and become party to the Convention, along with two other multilateral environmental agreements: the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, signed in September 1998, and the Protocol to the 1979 Convention on Long-Range Transboundary Air Pollution (LRTAP) on POPs, signed in June 1998.

For more information on the Stockholm Convention, see: www.pops.int/.

Programs and Initiatives

Tribal and Non-Tribal Alaskan Science and Research Information !

Alaska Native Health Board (ANHB)	www.anhb.org
Alaska Native Science Commission (ANSC)	www.nativescience.org
Aleutian/Pribilof Islands Association, Inc. (A/PIA)	www.apiai.com
International Congress on Circumpolar Health (ICCH)	www.iuch.org
Native American Fish & Wildlife Society (NAFWS)	www.nafws.org
Alaska Federation of Natives	www.nativefederation.org
Alaska Community Action on Toxics	www.akaction.org
Association of Village Council Presidents	www.avcp.org
Cook Inlet Tribal Council	www.citci.com
Bistol Bay Native Association	www.bbna.com
Yukon River Inter-Tribal Watershed Council	www.yritwc.com
Central Council Tlingit and Haida Indian Tribes of Alaska	www.ccthita.org
Alaska Native Resources	www.alaskanativeresources.com
National Tribal Environmental Council	www.ntec.org
Alaska Inter-Tribal Council	www.aitc.org
Cook Inlet Regional Citizens Advisory Council	www.circac.org
Gwich'in: Social and Cultural Institute	www.gwichin.ca
Native American Fish & Wildlife Society- Alaska	www.nafws.org
Alaska Native Harbor Seal	www.harborsealcommission.org
Alaska Traditional Knowledge and Native Foods Database	www.nativeknowledge.org
Tanana Chiefs Conference	www.tananachiefs.org
Tribal Solid Waste Advisory Network	www.tswan.org
National Network of Libraries of Medicine, Pacific Northwest Region, Inup	nnlm.gov/pnr

Northern Indigenous views on climate change and ecology,	www.snowchange.org
Yukon-Kuskokwim Health Corporation	www.ykhc.org
Southeast Alaska Regional Health Consortium	www.searhc.org
American Indian Science & Engineering Society	www.aises.org
Heartbeat Alaska	www.jeaniegreene.com
RurAL CAP	www.ruralcap.com/Cod/RAVEN
Circumpolar Conservation Union Technology, Sequoyah Research Center	www.circumpolar.org
Maniilaq Association	www.maniilaq.org
Inuit International Elders Council	www.inuitcircumpolar.com
Ilisagvik College in Barrow, Alaska	www.ilisagvik.cc
Inuit Tapiriit Kanatami	www.itk.ca
Aboriginal Canada Portal	www.aboriginalcanada.gc.ca
Inuit Circumpolar Conference	www.inuitcircumpolar.com
Indigenous Environmental Network	www.ienearth.org
Arctic Council Indigenous Peoples Secretariat	www.arcticpeoples.org
Native WEB	www.nativeweb.org
Alaska Eskimo Whaling Comm.	www.uark.edu/misc/jcdixon/historic_whaling/aewc/aewc.htm
First Nations Environmental Network	www.fnen.org
Sustainable Nations Development Project	www.sustainablenations.org
The Aujaqsuittuq Project	www.aujaqsuittuq.com
Native American lands Environmental Mitigation Program	www.denix.osd.mil
Alaska Environmental Resources Hub Online	www.aerho.org



Programs and Initiatives

North Pacific Marine Research Program	www.sfos.uaf.edu
The Alaska Sea Otter and Stellar Sea Lion Commission (TASSC)	www.seaotter-sealion.org
Alaska Native Tribal Health Consortium (ANTHC)	www.anthc.org
Barrow Arctic Science Consortium	www.arcticsscience.org
U.S. Fish and Wildlife Service –Alaska Region	alaska.fws.gov
Biomedical Research Infrastructure Network (BRIN)	www.ncrr.nih.gov
U.S. Bureau of Indian Affairs	www.doi.gov/bureau-indian-affairs
Denali Commission	www.denali.gov
U.S. EPA	www.epa.gov
U.S. EPA Tribal Science Council	www.epa.gov/osp/tribes/tribal
U.S. Agency for Toxic Substances and Disease Registry	www.atsdr.cdc.gov
Alaska Department of Environmental Conservation	www.dec.state.ak.us
U.S. Indian Health Service	www.ihs.gov
Institute for Tribal Environmental Professionals	www4.nau.edu/itep
Arctic Research Consortium of the United States (ARCUS)	www.arcus.org
U.S. National Institutes of Health	www.nih.gov
U.S. Center for Disease Control, Arctic Investigations	www.cdc.gov/ncidod/aip
Institute for Circumpolar Health Studies	www.ichs.uaa.alaska.edu/ichs
National Resource Center for American Indians, Alaska Natives, and native Hawaiian Elders at UAA	www.elders.uaa.alaska.edu
Cold Climate Housing Research Center	www.cchrc.org
Arctic Health Website	www.arctichealth.org
Arctic Council	www.arctic-council.org
International Polar Year (IPY) 2007-2009	www.ipy.org/development/eoi/details
Arctic Human Health Initiative	www.hhs.gov/asl/testify/to60926
International Union for Circumpolar Health	www.iuch.org

U.S. National Ocean & Atmospheric Administration (NOAA)	www.noaa.gov
Arctic Council Indigenous Peoples Secretariat	www.arcticpeoples.org/arctic-council
Cultural Survival-Arctic Region	www.arctichealth.org
Northern Contaminants Program	www.ainc-inac.gc.ca/ncp
Beluga Whale Traditional Ecological Knowledge	www.mnh.si.edu/arctic
Alaska Department of Fish and Game	www.adfg.state.ak.us
National Science Foundation	www.nsf.gov
Alaska Science Symposium 2006	www.georgewright.org
US Global Change Research Program	www.usgcrp.gov
American Indian and Alaska Native Program	www.aianp.uchsc.edu
Alaska Sea Grant College	www.seagrant.uaf.edu
Dietary Benefits and Risks in Alaska Villages	www.nativescience.org
Northern Research Forum	www.mnh.si.edu/arctic
Arctic Studies Center-Alaska	www.mnh.si.edu/arctic
Alaska Science & Technology Foundation	www.dced.state.ak.us/aslf
U.S. Geological Survey-Tribal	www.usgs.gov/indian
U.S. National Cancer Institute, Native American Initiatives	surveillance.cancer.gov/disparities/native
Center for Alaskan Coastal Studies	www.akcoastalstudies.org
Alaska Coastal Marine Institute	www.sfos.uaf.edu/cmi
Alaska Ocean Observing System	www.aos.org
Alaska Fisheries Science Center	www.afsc.noaa.gov
US Army Corps of Engineers-Alaska	www.poa.usace.army.mil
Society for Conservation Biology	www.conbio.org
Earth watch Institute, Alaska	www.earthwatch.org
American Association for Advancement of Science	www.aaas.org

Programs and Initiatives

Alaska Whale Foundation	www.alaskawhalefoundation.org
Arctic and Antarctica Research Institute (Russia) Arctic Long Term Ecological Research Site	www.arctic.noaa.gov/research
Arctic Long Term Ecological Research	ecosystems.mbl.edu/arc
Alaska Area Native Health Service	www.dsfc.ihs.gov
Village Safe Water	www.state.ak.us
Alaska Traditional Diet Project	www.atsdr.cdc.gov/alaska
Pollution Release & Transfer Registers (PRTR)	www.cec.org
EPA Cook Inlet Fish Study	www.epa.gov/waterscience
Center for Alaska Native Health Research (CANHR), University of Alaska	www.alaska.edu/canhr

North Pacific Marine Research Program	www.sfos.uaf.edu
Alaska Native Knowledge Network	www.ankn.uaf.edu
Sheldon Jackson College, Sitka	www.sheldonjackson.edu
University of the Arctic	www.uarctic.org
Byrd Polar Research Center, Ohio State University	bprc.osu.edu
Churchill Northern Studies Center	www.churchillscience.ca
Institute of American Indian and Alaska Native	www.iaiancad.org
Alaska Native, Fairbanks AK, Science Engineering Program	www.uaf.edu/outreach



The Tribal LifeLine Project

Elizabeth Resek, Deputy Director, EPA's Office of Science Coordination and Policy/Office of Prevention, Pesticides, and Toxics

The Tribal LifeLine Project was initiated so that the unique diets and activities of traditional lifestyles, such as those of Tribes, are accurately reflected when making decisions that affect the health of communities and their environment. The primary objective of the project is to create a suite of models that enhance the existing LifeLine™ Exposure and Risk Assessment Software in order to be able to characterize real living scenarios of communities. This tool is being developed not only to provide regulators with the ability to realistically characterize exposure and risk for focused populations, but also to build capacity within communities for informed decision-making about health and environmental concerns. The software will be valuable for use with any subpopulation (e.g., farm workers, sports fishers, and coastal communities with high fish consumption), although the focus of the Tribal LifeLine Project has been on Tribal communities, beginning with Alaska Native communities. The project started with the Alaska communities because of the prevalence of subsistence-based diets, the incidence of high cancer rates, and the presence of abandoned military waste sites and open dump sites.

The existing LifeLine™ Software is a probabilistic exposure and risk assessment modeling tool, already peer reviewed and in use by EPA's Office of Pesticide Programs and elsewhere internationally. The fundamental approach for the model, which remains the same for all versions, is to describe

individuals in a population (in terms of diet, activity, physiology, housing, etc.) in order to characterize opportunities for exposure. As with the existing LifeLine™ Software, OPPTS continues to seek input from groups such as EPA's Science Policy Council Steering Committee and Committee for Regulatory Environmental Modeling throughout the development of the software enhancements.

The enhanced software will include such key components as the Dietary Record Generator and the Activity Record Generator and, like the current version, will be free and publicly available for download and use. These stand-alone products will allow the user to employ data that accurately reflect the unique diets and activities of focused populations which to date have been lacking in risk assessments for the general population. Other important aspects of the Tribal LifeLine Project include the ability to address: seasonal mobility of communities (different locations of subsistence-based hunting and gathering often involve separate exposure and risk scenarios such as different water sources and food consumption), age-dependent differences in diet, health parameters of concern (such as asthma and diabetes), and "cultural blending" (capturing that Tribal community diets consist of both traditional subsistence foods and more "western" commercial diets).



*Photograph courtesy of
The LifeLine Group*

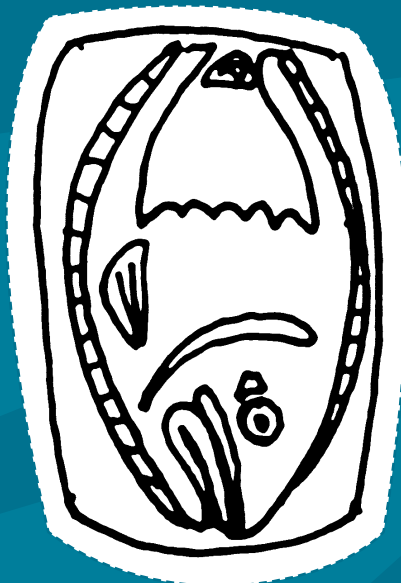
Next steps for the Tribal LifeLine Project include development of a user interface for the model that makes it readily usable by Tribal science and health professionals and their advisors. The report generator will also be adapted to yield the most relevant output formats for communicating analyses. In conjunction with the Tribal LifeLine Project, the capacity to assess multiple chemicals simultaneously, as well as to characterize nutritional intake, is being developed. EPA will establish policy on criteria for data quality ("data standards") to ensure relevance, representativeness, transparency, and use of appropriate quantitative parameters with this tool. Finally, OPPTS is also developing approaches to training and technical assistance, particularly for Tribal communities. For more information on the Tribal LifeLine Project, please visit the project website at: www.TheLifeLineGroup.org.

Kid's Page

Color, Cut and Paste! Build your own Totem Pole by coloring the pictures, then carefully cutting them out and pasting them on top of each other to build your own totem pole!

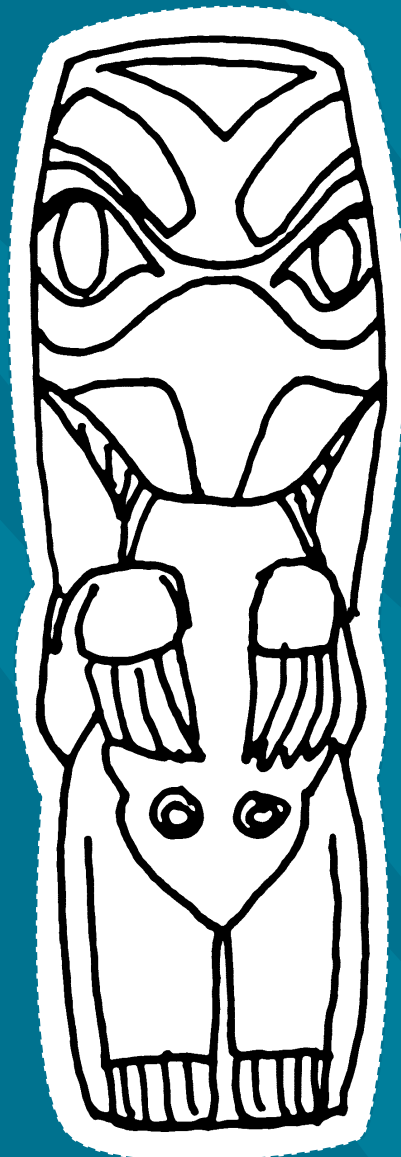
Salmon

The salmon's life cycle is highly respected, and it is believed that observing and respecting the salmon brings prosperity. It is a vital Indian food resource, and many legends describe its beginning.



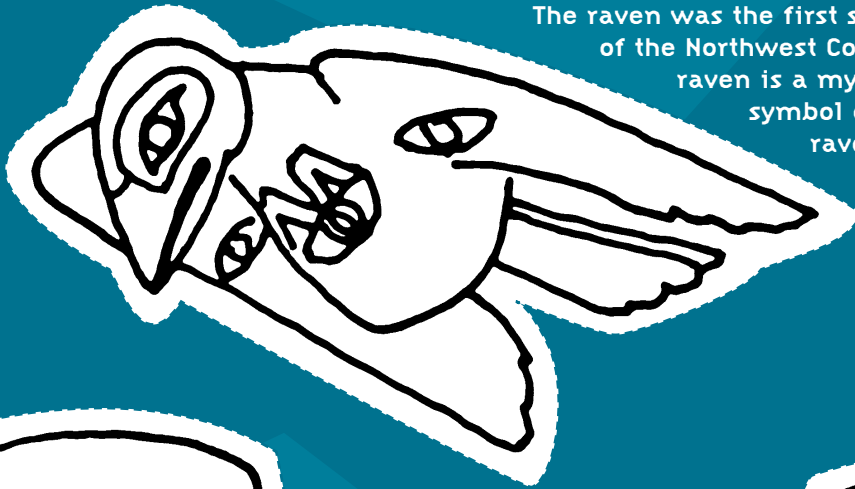
Eagle

The eagle is a symbol of power and prestige. The eagle's "down" symbolizes peace and friendship. The Eagle is a traditional gift given by couples because it represents the peace and security of their relationship.



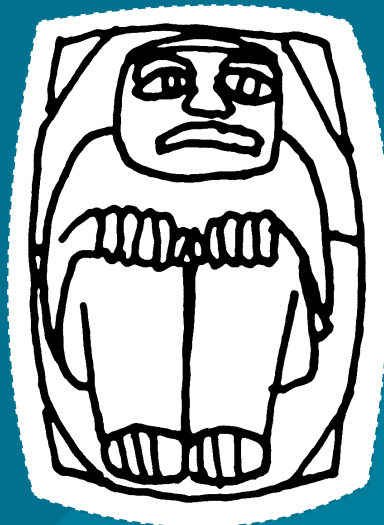
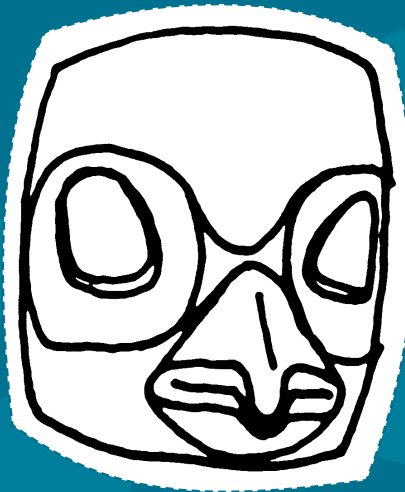
Raven

The raven was the first symbol and crest of the Northwest Coastal Indians. The raven is a mystical bird and symbol of prestige. The raven commonly is given to someone who is respected and admired.



Love Birds

Haida and Tlingit Indians have two main clans, the Eagles and the Ravens. Traditionally, members of the same clan cannot marry. The lovebirds symbolize the joining of an Eagle member to a Raven member in marriage.



Totem Poles are thought by many to be a symbol of Native culture. Generally, their production was limited to six tribes in British Columbia and southeastern Alaska, including Bella Coola, Haida, Kwakiutl, Tlingit, Tsimshian and West Coast, and each tribe had its own distinctive style. Production of Totem Poles flourished in the 19th century. Totem Poles are not worshipped, but the stories they tell often inspire respect and spirituality. Now make your own style! www.btiger-lily.net/BTTotem.html.

