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About the Journal

The journal *Arctic Research of the United States* is for people and organizations interested in learning about U.S. Government-financed Arctic research activities. It is published semi-annually (spring and fall) by the National Science Foundation on behalf of the Interagency Arctic Research Policy Committee and the Arctic Research Commission. Both the Interagency Committee and the Commission were authorized under the Arctic Research and Policy Act of 1984 (PL 98-373) and established by Executive Order 12501 (January 28, 1985). Publication of the journal has been approved by the Office of Management and Budget.

Arctic Research contains

- Reports on current and planned U.S. Government-sponsored research in the Arctic;
- Reports of ARC and IARPC meetings; and
- Summaries of other current and planned Arctic research, including that of the State of Alaska, local governments, the private sector and other nations.

Arctic Research is aimed at national and international audiences of government officials, scientists, engineers, educators, private and public groups, and residents of the Arctic. The emphasis is on summary and survey articles covering U.S. Government-sponsored or -funded research rather than on technical reports, and the articles are intended to be comprehensible to a nontechnical audience. Although the articles go through the

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As indicated in the U.S. Arctic Research Plan, research is defined differently by different agencies. It may include basic and applied research, monitoring efforts, and other information-gathering activities. The definition of Arctic according to the ARPA is "all United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian chain." Areas outside of the boundary are discussed in the journal when considered relevant to the broader scope of Arctic research.

Issues of the journal will report on Arctic topics and activities. Included will be reports of conferences and workshops, university-based research and activities of state and local governments and public, private and resident organizations. Unsolicited nontechnical reports on research and related activities are welcome.

Address correspondence to Editor, *Arctic Research*, Arctic Research and Policy Staff, Office of Polar Programs, National Science Foundation, 4201 Wilson Boulevard, Arlington VA 22203.

Cover *Mukluks are made for many different weather and ceremonial conditions by Inupiaq skinsewers. They serve as metaphors of survival and hope in many Inupiaq folktales. If they swing when hung, for example, their wearer is still alive—even when missing on the ice. These Arctic-coast-style waterproof boots (qagiakruq) were made by Hannah Koonook Hawley of Kivalina/Point Hope 40 years ago.*

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Social Science Partnerships in Arctic Research

Flexibility, willingness to learn, and a commitment to building relationships of trust and mutual respect characterize collaborative research projects supported by U.S. Federal agencies. Arctic communities, researchers, and funding agencies may start with different goals and institutional incentives, but when they come together as teams, unanticipated insights and continuous learning occur. The social science articles presented in this issue of *Arctic Research of the United States* cover an array of topics and research methods, but they all rely on collaboration: collaboration between scientists and local communities, on the one hand, and between scientists from different disciplines, on the other. These interdisciplinary and community partnerships contribute valuable insights into such questions as how best to access and use the cultural knowledge of the past to shape the future, how to sustain ecosystem health, and how early inhabitants of the Arctic influenced and adjusted to environmental changes.

Building and maintaining such partnerships require enormous effort and attention, both across scientific disciplines and across researcher–community boundaries. The researchers and project participants who contributed articles to this issue and those who are working to forge and maintain collaborative relationships are to be congratulated in their pursuit of excellent science relevant to the needs and concerns of Arctic residents.

The first article, by Ann Fienup-Riordan, tells of an extraordinary journey. Yup'ik elders traveled with Ann from Alaska to Berlin, Germany, to work with a little-known collection of Yup'ik artifacts at the Museum für Völkerkunde. This research team documented the many objects in the museum's collection, sharing stories, songs, and other cultural knowledge to bring back to the villages in a kind of "visual repatriation." Sponsored by the National Science Foundation, the project grew out of an exhibit called *Agayuliyararput* (Our Way of Making Prayer), supported by both the National Endowment for the Humanities and the National Endowment for the Arts. This project crossed many borders—between humanities and the sci-

ences, Alaska and Europe, past and present.

Deborah Corbett describes the joint efforts by the Kenaitze Indian tribe, the U.S. Fish and Wildlife Service, and the USDA Forest Service to explore the prehistory of the Kenai Peninsula in Alaska. Together, archaeologists from Federal agencies and Native youths from the Kenaitze Indian tribe's Susten Camp seek answers to the questions: Who were the first people on the Kenai Peninsula? When did they come? Not only has the team found answers to such questions, but the partnership has also helped to expose Native youths to career possibilities in cultural and natural resource fields.

Igor Krupnik and Lyudmila Bogoslovskaya examine the connections between subsistence hunting patterns and annual weather/ice variations in the Bering Sea and North Pacific region. They rely on diverse sets of data from the 1920–1970 period to model subsistence use of marine resources and correlate Native hunting to local ice/weather regimes and short-term environmental fluctuations. Supported by the National Oceanic and Atmospheric Administration, this interdisciplinary project shows the value of integrating disparate data to model sustainability in marine ecosystems.

Place-name research reveals the complex connections between land, economies, and social relationships, as Susan Fair shows in her study in partnership with the Shishmaref Native Corporation. What began as a National Park Service project led to support by the National Science Foundation to conduct oral histories, mapping, and other community-based research and educational activities on Alaska's Seward Peninsula.

Michael Kunz (of the Bureau of Land Management) and his research team investigate the history of some of the earliest human inhabitants of the New World at the Mesa site located on the northern side of the Brooks Range. This interdisciplinary team examines the record of human occupancy at the Mesa through a combination of archaeological, geological, paleontological, and DNA studies to discover the nature of early human–environment interactions.

Thomas Thornton, working with Harold Martin

of the Southeast Native Subsistence Commission, explores the sociopolitical and scientific issues related to the documentation of place names and their cultural associations. Funded by the National Park Service, this study shows the value of traditional knowledge and collaborative research methods in addressing culturally sensitive questions.

Traditional knowledge is the topic of the Alaska Native Science Commission's report on a project funded by the Environmental Protection Agency to document Alaska Native understandings of environmental changes. The goal of the project is to provide a means for Alaska Natives to identify, address, and document their concerns about radio-

nuclides and other types of contamination.

As shown by the research projects reported here, Arctic social scientists have partnered with Arctic communities and scientists in other disciplines to answer fundamental questions about the past, present, and future. Federal agencies have responded to the need for such collaborations by lending their support and creating opportunities to reach across disciplinary, geographic, and socio-cultural boundaries. As we approach the coming decade in Arctic research, we look forward to further partnerships among diverse scientific and geographic communities in advancing knowledge and discovery.

Yup'ik Elders in Museums

Fieldwork Turned on its Head

*This report was prepared by
Ann Etnepuk-Riordan,
Association of Village
Council Presidents,
Bethel, Alaska*

In 1881 Adolf Bastian, director of Berlin's Royal Ethnological Museum, commissioned a 30-year-old Norwegian jack-of-all-trades, Johan Adrian Jacobsen, to travel to America's northwest coast and collect for his museum. Aware that the Geographical Society of Bremen was sending the Krause brothers to the Pacific Northwest, Jacobsen set his sites on Alaska. He was especially interested in slate blades, nephrite (jade) amulets, and other "stone age" tools, and hoped to bring home evidence of ancient Eskimo adaptations.

Arriving in St. Michael in 1882, the year after Edward Nelson left, Jacobsen continually complained in his correspondence that "Mr. Nielsen" already had gotten all the good stuff. In fact, plenty remained for Jacobsen, and he returned to Berlin in 1883 to great acclaim.

Jacobsen spent the following winter in Berlin cataloging his collection of 6720 objects, a third from Yup'ik communities on the Bering Sea coast. His lack of academic training, however, earned him a cool reception among museum professionals. In part because of these limitations, Jacobsen's collection remained largely unpublished until World War II, when most of it was thought to have been destroyed during the bombing of Berlin. In fact, the Soviet Army took much of Jacobsen's material (along with other museum collections) by train through Poland to Leningrad when they retreated from Berlin. In 1978 these collections were sent to the Leipzig Museum for Ethnology in East Germany and, after the fall of the Berlin wall, returned to the Museum für Völkerkunde.

I first visited the Museum für Völkerkunde in 1994 in search of masks for the exhibit *Agayuliyarput* (Our Way of Making Prayer), supported by both the National Endowment for the Humanities and the National Endowment for the Arts. There I was stunned to find the museum staff busily unpacking this extraordinary Yup'ik collection, second only to Nelson's in size and scope, yet with accession records still handwritten in old

German script and almost completely unpublished. I spent my brief stay in Berlin photographing masks. But along with photographs, I brought home a desire to return to Berlin and dig deeper into Jacobsen's treasures.

Yup'ik elders travel to Germany

After the mask exhibit opened in Anchorage in 1996, a team of Yup'ik elders and community leaders and I set to work planning for that return visit. In 1997 the National Science Foundation's Office of Polar Programs funded our project through a grant to the region's nonprofit corporation, the Association of Village Council Presidents. We proposed to bring a group of Yup'ik elders to Germany for an extended investigation of Jacobson's collection, record and translate the information they provided, compare it with what Jacobson learned about the objects he collected, and finally publish the results of our work, making it available to both the Yup'ik and scientific communities.

After a year's preparation, including a four-month battle with Passport Services, our seven-member "Yup'ik delegation" set out from Anchorage on September 5, 1997. The group included Marie Meade as interviewer and translator; Andy Paukan, mayor of St. Marys, as videographer; four elders representing the different areas of the region—Wassilie Berlin, Paul John, Annie Blue, and Catherine Moore; and me as photographer and guide. We spent three weeks working at the museum. As with the mask exhibit, what we sought was not so much the collection's physical return to Alaska, but the return of the knowledge and stories, the history and pride that they embodied and that, we hoped, we would be able to bring home.

From the beginning the Yup'ik reaction to learning about the existence of Yup'ik collections has been gratitude and pride. Andy Paukan stated it well:

Work in Germany was made possible by a three-year grant from the National Science Foundation, Office of Polar Programs. The project could not have gone forward without the help of the Museum für Völkerkunde, especially their director for North American Ethnology, Peter Bolz. The translations were prepared by Marie Meade, who has been a full partner in this research project. A more detailed description of the process is forthcoming in Arctic Anthropology, Volume 35.

The "Yup'ik delegation"
to Berlin's Museum für Völk-
erkunde, September 1997.
From left to right: Catherine
Moore, Wassilie Berlin, Paul
John, Annie Blue, Marie
Meade, Andy Paukan, and
Ann Fienup-Riordan.



I'm thinking that coming to Germany to examine these objects will make it easier for us to explain our culture to our young people. We will be able to tell them things with no reservations. Our work will make it easier to prepare teaching material about our culture for our younger generations.... With this work, our roots and culture will come closer to us.

This attitude toward collections as opportunities to affect the future was the primary reason elders and regional leaders supported this project and agreed to travel so far and work so hard. While in Germany they saw themselves not as sightseers or solitary researchers, but as representatives of the Yup'ik nation. The elders who traveled to Berlin were the recognized "professors" from their regions and were chosen both for their ability and willingness to share what they knew. Their detailed knowledge was impressive. They spoke in collections, not for my benefit or for that of the scholarly community, but to enlighten and empower their descendants.

To understand the magnitude of their trust and dedication, you should know that three of the four elders speak only Yup'ik. Two are in their eighties and the others in their seventies. Yet they made a 24-hour plane trip, crossing 10 time zones, to a place with unfamiliar sounds and sights and foreign food. The first morning we were there, I remember teasing 81-year-old Wassilie Berlin, calling him my *uicungaq* ("dear little husband," or teasing cousin).

This endearment has often worked to break the ice with elders. Instead of laughing, he looked at me seriously and said, "No, you are my daughter." He said this in part because, since we had met, I had served him like a daughter. In the weeks that followed, he changed his mind. He and the other elders sometimes called me their mother because, along with Marie, I cooked and cared for them. I was humbled one morning near the end of our trip when Paul John, the acknowledged leader of our group, said that we had been chosen by God to do this work. Although we had fun on our trip, this was very serious business.

Elders' work in collections

Our work in the museum began with a brief tour of the storage room where 14 large cases with glass doors held the Yup'ik collections. There we stood together and sang "Tarvarnauramken," a song describing the traditional act of purifying oneself with smoke. Following the "blessing" song, Annie Blue led us in the Lord's Prayer. Three weeks later our work ended with a feast and another prayer as we joined hands with the German museum staff we had come to know.

Between prayers we looked at all two thousand objects, one by one. Our major hurdle at the museum was not the German language, but their organization, in which "Eskimo" and "Arctus" are comprehensive

categories. We were fortunate that although Yup'ik and Inupiaq collections were mixed, most objects from Alaska, Canada, and Greenland were stored separately by type (for example, net sinkers in one case and spear points in another). They had not, however, been divided by Alaska region (Yukon, Kuskokwim, Coastal, Bristol Bay), which, as it turned out, would have been a disaster for our regionally diverse group. When presented with a group of bows, for example, the elders would comment in turn on those from their area. The separation between men's and women's things that I had anticipated did not take place. For example, Annie and Catherine knew almost as much about the use of bows and arrows as Wassilie and Paul; conversely, Paul and Wassilie spoke eloquently about the making of sinew, technically "women's work."

Group dynamics followed Yup'ik protocols. We had a number of English-speaking visitors during our stay, but we did our best work when discussions were carried out in Yup'ik. Formal Yup'ik etiquette dictated our roles as speakers and listeners while working in collections. As the eldest man, Wassilie spoke first, followed by Paul as the recognized expert orator. In cases where Paul knew more about an object than Wassilie, he would still listen to Wassilie before giving a full explanation. When we looked at something that both men were familiar with, Paul would often tell Wassilie to go ahead and talk about it. That "talk" took a range of forms, including names, personal experiences, actions, stories, and songs.

Names

The detailed vocabulary associated with the collected objects was a major point of interest. When looking at a box of harpoon points, elders sorted them by named type. Not only were there *akitnat* (arrow points), but *meq'ercetaat* (arrow-points used for hunting), *nuiret* (points for bird or rabbit spears), and *umit* (stone arrowpoints used during warfare). A large needle used to string salmon heads had a special name, as did a rock used as a tool for decorating clay pottery. The comment "*Ayuqluni* (It's the same)" let us move relatively fast through boxes of objects of a type we had already discussed.

Regional differences in design and designation were points of great interest. When presented with a box mixing Yup'ik and Inupiaq ivory spear points (*talutet*), the elders picked out ones from their area to comment on, ignoring those of their northern neighbors. Although technically the handiwork of Yup'ik speakers, things from Unalakleet were dismissed as Inupiaq and not investigated.

Precontact regional hostilities were referenced. The third day we looked at a box of spear throwers (*nuqaq*). I laid them out on the table, and each elder picked up those made from their area. Annie Blue chose the *nuqaq* made by the warlike Aglegmiut and playfully pretended to use it as a gun to shoot Paul and Wassilie across the table.

The elders made old things familiar in their comments, emphasizing similarities between past and present over differences. Paul John designated

Paul John recording information on the use of ivory implements at the Museum für Völkerkunde.



an ivory story knife (*yaaruin*) a “cartoon-*alriit*.” Catherine called a bladder water bottle (*mervik*) a “Yup’ik thermos.” And when looking at ivory pieces, Andy commented, “I guess our ancestors forgot to patent these gas hose connectors.”

Personal reflections: The past made present

Jacobsen’s diverse collection also evoked a wide range of personal experiences. Wooden bowls were tremendously evocative. For example, Wassilie took up a young boy’s bowl, like one he used as a child, and related the *inerqutet* (rules) from his area about what could and could not be placed in it. Looking at a large wooden snow shovel, Paul John recalled that a young man would shovel for four years before he would see a seal head emerging from the path he had been clearing and so “graduate” (become a good hunter). Again and again I heard the traditional rules for living I had recorded in *Boundaries and Passages*, but in this context they were dramatically organized around real objects and activities rather than didactically around ideas of what it meant to be a “real person.”

The elders continually used objects to make points in an ongoing conversation among themselves. This was nowhere more striking than the fourth day, when we looked at a model dance house. Its delicately carved ivory figures and unusual costumes drew no comment, but Andy and Paul both gave long explanations of the tiny drum model. In brief, they said that the drum holds the elders and all that is good but that half of the Yup’ik people today are outside this drum. I was listening to a political statement about what it meant to be Yup’ik in the modern world that would certainly be restated in public hearings back in Alaska.

Equally eloquent was a ten-minute description of a wooden dipper by Paul and Wassilie. Wassilie first described the dipper’s use, followed by Paul’s detailed account of the drinking restrictions imposed on young boys to make them fleet and strong. Wassilie then described the face designs painted on the inside bottom of drinking containers, which reminded Paul of the story of the boy who was told to look into a water bucket where he observed the face of an old man. This, his grandmother told him, was his own image, as he was destined to live a long life. Wassilie then told of a woman whose husband was lost on the ice. She told her son to look into the water bucket, and

there he saw an image of his father in his boat, foretelling his safe return. Paul John concluded reflectively, “If we had continued to channel these customs to the present time, we would still have our own shamans that would be able to do that kind of work for us ordinary people.” All this from three ounces of old wood!

The handling of the objects was savored as a personal experience that would be talked about for years to come. In the process the elders noticed everything, for example, an ivory story knife carved for a “lefty” and a restored ax with the blade put on backwards. In three weeks we examined more than two thousand items, feeling each grip, looking down the line of each arrow, opening each tobacco box. Our German hosts gave us space to work, permission to touch, and privacy to explore, without which our work could never have gone forward.

Paul John once observed Peter Bolz, the Museum’s North American curator, moving his hands in enthusiastic explanation, and he called Peter “a real dancer.” In fact, all the elders danced through the collection, chopping with axes, shooting arrows, harpooning seals, shoveling snow, mixing *akutaq*, and making fire with the bow drill. Among the most dramatic explanations was Annie



Wassilie Berlin trying out a bow and arrow at the Museum für Völkerkunde, with Andy Paukan looking on.

Blue’s preparation of snuff tobacco. Assembling seven tools from different parts of the collection, she first pretended to cut, pound, and strain the tobacco, mix it with ash, and then sniff it into one nostril, sneezing and wiping the water from her eyes when she was done. Her presentation was so realistic that the group later questioned whether today’s young people should be shown the video lest they want to revive the custom.



Annie Blue demonstrating the preparation and use of snuff tobacco at the Museum für Völkerkunde.



Needless to say, we played with all the toys, including tops, darts, and an ivory spindle spun in a bowl in a game called *caukia*. When we looked at an eagle-feather dance wand (*nayangan*), Wasilie walked around the table and stood Catherine up, telling her to sing the “asking song.” Then he quickly left the room and returned carrying his coat as a gift, showing his muscles, and dancing to the beat. In fact, every day I had the overwhelming feeling of attending a dance festival. Unlike the mask exhibit *Agayuliyararput*, where exploring collections had paved the way for a major series of events, this was the event, not mere preparation. A book might be the result, but the action was now.

Songs and stories

Just as the objects evoked names, remembrances, and dramatic displays, they also conjured a multitude of stories. The numerous bows and arrows started an avalanche of war stories that continued through lunches and long evenings at the hotel. When Annie Blue saw a cutting board, it reminded her of the story of the woman who turned into a bear by dressing in a bear skin with a board behind her back to take revenge on her unfaithful husband, Picartuli. When we looked at spearheads, Andy asked Paul to describe the detailed division of a seal after the hunt.

My favorite story was when Annie Blue held a Nushagak carving in front of her while she related an account of the creature *paalraayak*, named in Nelson’s *The Eskimo about Bering Strait* but until now a mystery.

They have mentioned *paalraayak*. And...the year before last, it was mentioned that there was such a creature in the area behind Assigyugpak.... In the past people were told not to go...behind Assigyugpak. Since the younger generations don’t pay attention to the old teachings, they have begun to travel around in that once-restricted area....

I’d like to look at that carving while I tell you this story.

The animal they saw resembled a land otter like this, and its face looked like a land otter’s face, but as they observed it, it would disappear into the ground and come back up again.... As the couple walked and their feet began to sink into the ground, a person suddenly emerged out of the ground near them.... And the land otter they had seen disappeared into the ground.

It was said that *paalraayit* were attracted to *caagnitellriit* [people experiencing puberty, death, childbirth, miscarriage, etc]. *Paalraayit* resided in the mountains. There are many mountains in our area as you know....The *caagnitellriit* were restricted from roaming in them....

It was said that when *paalraayit* came to a person, they swam all over his body. And many came swimming up and down in front of his nose. ... Once they’ve entered a person, the person would soon be destroyed.

Annie Blue’s account meant different things to those assembled in Berlin. For me it was exciting to hear her solve a long-standing scholarly riddle. But Annie’s motive for telling this story was not academic. As she made plain in her telling, rules guided a young person’s actions in the past, and we ignore these rules today at our peril. She wants the younger generation to hear her stories and gain awareness of their history so that they can avoid very real dangers in the world today.

Academics like myself were not the elders’ primary audience. Rather, I was the mother, the guide. Yet listening, I learned much that would be of great interest to both the Yup’ik and scientific communities. For example, I learned that dog feces was a common binding agent in shaping clay pots. Paul John described how aged seal blood was used as glue and how carvers collected and dried sea foam to use as sandpaper to polish wooden bowls. Examining two small carved faces with chin labrets, he explicitly stated the connection between humans and animals that I had always hoped to hear. He said, “The Nunivaarmiut used these ornaments on their chins. It was said that these represented walrus tusks. When men wore them they were pretending to be walrus.”

Later we looked at a large mask with five-fingered hands projecting from its side. Wassilie Berlin recognized it as a representation of *qunguq* reaching its hand out of the sea and putting it down on the ice. According to Wassilie, the hole in the hand was where the hunter aimed his harpoon. Wassilie's comment constitutes the most explicit explanation of this iconographic feature that I have ever heard.

Objects also evoked disclaimers about what they were not. For instance, Paul John looked at one carved figure and said, "This figure doesn't represent Qupurruyuli. But let me mention it since it suddenly came to mind." He then continued with a rare account of Qupurruyuli, the woman of the sea with flowing hair, who created a pathway through the ice for the hunter who owned her as a power source.

When the traveling companions became curious, they looked and saw a pair of human hands in front of his kayak visible from down below. And since the hands were extended like this, the ice in the front was being moved to the sides, making a pathway for the kayak to glide through. The upper part of the person's long hair was visible above the water with the bottom part down below. And when they looked down from their kayaks they saw the rest of her hair in the water. Since Qupurruyuli was a woman, her hair was very, very long.

Not all stories inspired by the collection were deemed appropriate to be told. While looking at bags made of raven skins, the men remembered a raven story so embarrassing that they could not talk about it in front of us women lest it make us uncomfortable when we had intercourse with our husbands. The women later agreed that they "didn't mind not hearing it."

Among the most moving accounts was Wassilie's and Catherine's description of a small drum (*apqara'arcuun*) used by men and women in private. Holding the drum in front of their face, they would hit it from the front to summon their *avneq*



Catherine Moore demonstrating the use of a small drum like those she observed when she was young.

(literally "other half," felt presence) with song. All had observed this when they were young and remembered the power of these private ritual acts.

Along with stories, Jacobsen's collection also evoked many songs. A loonskin hat for the sweat-bath brought out a song about a loon, complete with its call. Holding two stuffed squirrels from Nushagak, Annie Blue told a story about squirrel and ptarmigan singing a slow-style *ingula* song. Wassilie sang the arrow song of the famous warrior Apanuugpak while we looked at slate blades. In fact, objects made of slate were particularly poignant as they had been used before these elders were born. This is a real strength of Jacobsen's collection, as he had intentionally sought out "ancient things."

We even recorded the sounds of the objects, holding up a caribou-tooth belt to record the teeth tinkling against empty bullet shells or shaking a pair of thumbless dance mittens to hear the wooden dangles. Marie's response to one song was, "That's a good one, we'll have to bring it back." Just as objects evoked songs and stories, we sometimes treated songs and sounds as objects to take home.

Last but not least, we told jokes. When we looked at a double bowl with a handle, Wassilie designated it an *iqvarcuutet*, a device for gathering berries, one side for blackberries and the other for red. Looking at a similar bowl, Paul said it was a bowl for twins, and Wassilie added that one side

Wooden figure that inspired Paul John to tell the story of Qupurruyuli, the woman of the sea.



was for urine and one for feces. This Yup'ik ribaldry brought on peels of laughter in the privacy of collections. When we were in public, however, Wassilie was constantly putting his finger to his lips in a futile attempt to hush us giggling women. Catherine agreed that we should not laugh in the presence of strangers, as they might think we were laughing at them.

Elders' reflections on the broader significance of collections

We looked at many rare things while in Berlin: thumbless gloves worn by a young girl during her first menstruation, an eagle-feather hood, a painted bladder, and ice skates carved in the shape of puffins. Yet I think the elders were not as impressed by what they saw as by what they heard from our hosts and from each other. Along with sharing what they knew, each elder had eagerly listened to their companions, learning as well as teaching. In the middle of our trip Andy said that he was reminded of what his father had taught him—that when you die you are still learning.

Wassilie spoke eloquently on the last day of our visit. He expressed his gratitude to Jacobsen, who lived in such a harsh environment so far from home to collect these objects. He also expressed his gratitude to the museum for the good care they were giving these things. He was impressed by the meticulous organization of objects and glad that they would be there for his children's children to observe: "Gosh, I'm so grateful for what he did. If he hadn't collected them, they would have disappeared long ago. Not one of the items would be visible now if our counterparts, the white people, hadn't collected them." Most of all he expressed gratitude to his fellow group members for all they had taught him.

Andy Paukan, the teacher, also spoke of his desire that what we had learned would be brought home for the benefit of the younger generation: "Our work seems to have opened up times ahead and filled it with information. ... With this work, our roots and culture will come closer to us." Yet his pride was mixed with regret. He concluded, "Evidently [our ancestors] lived a clean life. Their life was very good. By looking at their work, I envy them."

A determined leader as well as an eloquent orator, Paul John's parting words were perhaps the most pointed, reaching beyond the walls of the museum. Doing his first fieldwork in a non-English-speaking country, he had been observing

the German people, and he was impressed: "Here in Germany, I see that people truly live according to their tradition. I see that they have kept their ways."

He then contrasted their cultural integrity to the situation in southwestern Alaska.

When I think about our home I feel sad realizing that we Yupiit are not holding on to our traditional ways. And through my observation of this land and its people, I've realized that by not holding onto our traditions, our people have become confused about their own identity....

Even though I've heard about the vast ocean, I had not pictured it in my mind before. And since I came here, by looking at the time difference I now believe that we indeed have reached the other side of the ocean. When night comes to our families back home it would be morning here. Our places are so far apart.

Though we live far apart we've realized that people here have held onto their culture....

God indeed created many tribes with their own traditional ways and beliefs which were to be practiced until the end of the world.

Finally, Paul spoke about how our work in the museum might help to remedy this situation.

When we were looking at the objects that were once used by our ancestors, I began to realize that they were persevering and hardworking people.... Though they didn't have excellent tools, their workmanship was so fine. Western-made material was totally gone from their work. Gosh, our ancestors took charge of their lives....

Since we have no understanding, we've abandoned our cultural ways. But those of us that came here have been granted more understanding regarding our people....

My vision is this. Many of us seem to have been in the dark for many years. And now, stories and information about our roots have emerged from this unknown, faraway place across the ocean. Now that the knowledge is out, I hope our work together will be written and be presented to our people....

If our people begin to see them and begin to understand the culture of our ancestors, they might begin to believe and gain pride in their own identity. I envision our people gaining more faith in their own identity by seeing the objects or seeing their pictures or reading about them in books. My hope is that our work will bring our people closer to their own culture.

Much more important than any specific information they evoke, Paul sees collections as tools capable of teaching self-reliance and pride to young



Paul John demonstrating the use of a bow drill.

people who have grown up as second-class citizens in an English-only world. Knowledge is power, and it is Paul's strong hope that young people use this long-hidden knowledge as ammunition in their battle to take control of their land and lives.

Conclusion

The subtitle of this paper, "Fieldwork Turned on its Head," refers to the project's reversal of the traditional fieldwork paradigm in cultural anthropology. Whereas anthropologists are known to travel to distant lands to study the resident Natives, in this case Native elders traveled to one home of anthropology—the museum—to do their own fieldwork, coming to their own conclusions about the value of the ethnographic collections they explored. Archaeologists and material culture specialists within anthropology have always done research in museum storerooms, and Franz Boas, Alfred Kroeber, and George Bryan Gordon are but a few anthropologists who had indigenous people working in their collections. The thrust of their work was to increase non-Natives' knowledge and understanding of Native peoples, but in this case it is the Natives who seek an understanding of both the collections and the collection process so that they can use them for their own ends.

Our project is neither the first nor the only one of its kind. Bernadette Driscoll traveled to European and Canadian museums with Canadian Inuit seamstresses in the 1980s to study Inuit clothing styles and the terminology and symbolism associated with them. This fieldwork triggered a renaissance in clothing manufacture in some Canadian communities. In the early 1980s Susan Kaplan invited North Greenland Inuit to work in the museum, and she continues to work with Labrador Inuit using the Peary–MacMillan Arctic Museum and Arctic Studies Center collections. In the 1990s the repatriation movement has prompted increased access to and scrutiny of museum collections by members of various Native groups, often in collaboration with museum professionals. For example, Deanna Kingston has worked with King Island elders in the film archives of the National Museum of Natural History, while Stephen Loring and Aron Crowell of the Smithsonian's Arctic Studies Center have explored NMNH collections with a number of Alaska Natives, including a five-person group from Nunivak Island during a seven-day visit to the museum in February 1996.

Yup'ik elders' work in the Museum für Völker-



Ice skates carved in the shape of puffins.

kunde is an example of what I have described elsewhere as "visual repatriation." As in Yup'ik elders' comments on masks and mask-making in preparation for the *Agayuliyararput* exhibit, their primary concern was not to reclaim museum objects but to re-own the knowledge and experiences that the objects embodied. And as in the mask exhibit, instead of resentment at what has been lost and taken from them, elders expressed profound gratitude toward both the collectors without whom the objects would surely have been destroyed and the museums who so carefully preserve these objects today. While repatriation and struggles for the physical control of objects remain contentious issues, Yup'ik elders' work in collections provides a lesson in how Native access to collections can work for everyone's benefit.

There is a lesson here for museology as well. During recent decades, museum professionals have become more specialized, often training in curation and conservation rather than anthropology or history. Many are not researchers themselves, and their primary responsibility is to the objects, not the people whose ancestors made them. Their focus on the care and protection of objects can have disastrous consequences for visiting indigenous groups. I have accompanied Yup'ik elders on visits to museums thousands of miles from home and watched as their days in collections shrunk to hours as they waited for museum handlers to access objects, present them one at a time, and remove them before going on to the next piece. In contrast, our German hosts provided us ideal circumstances to explore collections, giving us the space, time, and privacy we needed. As a result, elders moved into collections, owning them in ways more restricted access would have made impossible.

Although a number of indigenous people have made short visits to the Museum für Völkerkunde's world-famous ethnographic collections,



Wassilie Berlin talking about the meaning of a mask.

ours was the first Native group to carry out a systematic study of an entire collection. Staff members were initially both concerned for the safety of their collections and wary of Native efforts to reclaim them. They were, however, willing to allow the visit, and their respect for these indigenous researchers grew as the days went by. Our workspace was in a large, well-lit open hallway between the museum's storage room and exhibit space, and passing staff members often stopped to watch the elders' animated interactions with collections, ask questions, and share in their excitement. Moreover, elders' expressions of thanks reassured them that it was not the objects that elders coveted but the opportunity to use them to teach and to learn. Not one object was broken or damaged during our three-week stay. Instead each was enriched with myriad pieces of information, stories, and songs.

As I boarded the plane to Berlin, exhausted by efforts to get passports for elders with multiple names and dates of birth, I vowed that I would never again try to take elders to objects. A week later, however, I knew absolutely that it was worth the effort. Ironically, though fragile objects like grass socks and gut-skin parkas will endure in

museum collections, elders will not. If we do not bring elders into museums over the next decade, we will lose an opportunity to understand collections in ways that Jacobsen and his contemporaries never imagined. More important than any specific information, in the hands of community leaders throughout southwestern Alaska this knowledge of the past has the potential to shape the future.

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Tribal Youth Connect Their Past with Their Future

This report was prepared by Debra Corbett, Alaska Region, U.S. Fish and Wildlife Service, and Alexander Lindgren, Cultural Heritage Program Director, Kenaitze Indian Tribe

He traces the polished edge of the stone ulu with the flat of his hand. "You can see the grinding work someone did thousands of years ago," Brett Encelewski, 17, of the Kenaitze Indian tribe says. "It's just exhilarating." For the last four years Native youths from the Kenaitze Indian tribe's Susten Camp have been working with archaeologists from the U.S. Fish and Wildlife Service and the USDA Forest Service to explore the prehistory of the Kenai Peninsula in Alaska.

On the south shore of the Kenai River, reached by a passenger ferry, the Russian River site is dotted with Eskimo and Indian house pits and storage caches. Nine pits at the confluence of the two rivers are the focus of the excavations. This site is part of the much-larger Sqilantnu Archaeological District, which stretches for at least six miles along the Kenai River. The district is unique in its mix of cultures and the intensity of the occupation. At least two cultures, the Riverine Kachemak and the Dena'ina Athabaskan, used the area. The Kachemaks were Eskimo people from the Kodiak Island area who adapted to the rich river environment between 3000 and 1000 years ago. The Dena'ina Athabascans, interior Alaskan big game hunters, moved in around 1000 AD and adopted a river-focused economy. People from all

over southern Alaska—the Kenai Peninsula, Cook Inlet, Prince William Sound, Resurrection Bay, and areas even farther away—gathered at the confluence to trade and feast during the rich summer salmon runs.

Two Federal agencies—the U.S. Fish and Wildlife Service (Kenai National Wildlife Refuge) and the USDA Forest Service (Chugach National Forest)—manage the sites in the district. Cook Inlet Region, Inc., an Alaska Native Corporation, has claims on parts of the historic sites in the area. The Russian River confluence is one of the most popular sport fisheries in Alaska, and thousands of people congregate there to fish for red salmon in June, July, and August. Despite several surveys and some testing, even the number of sites within the district remains uncertain. Archaeologists and land managers need to know more about the sites to protect the fragile remains from public use pressure and erosion. Many basic questions are completely unknown: Who were the first people on the Kenai Peninsula and when did they arrive? Why did the Kachemak people abandon the Kenai Peninsula? Were there contacts and interactions between the Kachemak and Dena'ina? Working with the Kenaitze Indian tribe's youth camp was one way to start understanding the complex prehistory of the area.

The Kenaitze are the descendants of the Dena'ina who lived in this area until the early 20th century, when they moved to Kenai for work in the commercial fisheries. The Chugach National Forest and the tribe formed a partnership to interpret the area's history and culture at the tribally managed Footprints interpretive site. In 1994 the Fish and Wildlife Service was pulled into the partnership when Alexandra Lindgren, Cultural Heritage Director of the tribe, challenged archaeologist Debra Corbett to involve the youth of the tribe's cultural youth camp, Susten Camp, in cultural resource management efforts on the Kenai National Wildlife Refuge.

The first year of the cooperative effort was a survey of the south bank of the Kenai River downstream of the confluence, resulting in the

Tribal youths and counselors measuring a feature in the deadfall.



discovery of five more sites within the archaeological district. The next year the youths helped excavate a historic Dena'ina house in the last village occupied on the upper Kenai River. They recovered beads and a few bone points. For the last two years the campers have been excavating a large house depression. The upper levels are a Dena'ina occupation that seems to be focused on processing the salmon caught just in front of the site. Below this level of drying racks and smudge fires is a large Kachemak house. We know very little about this occupation because we are still working through the Dena'ina levels. During the summer of 1998 three youths who had participated in the camp were employed cataloging the previous season's artifacts and learning to be interpreters at Footprints. For the future we will continue excavating the house at the confluence. The youths will help in designing interpretive materials for Footprints and in reporting the excavation results. We are planning to expand the project to develop a regional picture by surveying for sites, mapping known and newly discovered sites, and testing to fit sites into a temporal and cultural framework for the entire district. Future work will include a study of the natural and cultural environment, especially natural resource distributions, to define the geo-

graphic area used by site occupants and to investigate trade relationships throughout south-central Alaska.

Both partners hope to gain from the cooperative effort. The Fish and Wildlife Service is gaining scientific knowledge about the sites and occupations of the Squirrel District, and the information will be used to protect and interpret the sites for the public. So far the work has documented and dated, for the first time, the physical presence of Riverine Kachemak on the upper Kenai River. The Dena'ina materials recovered will help archaeologically define the Dena'ina presence on the Kenai Peninsula. Dena'ina cultural practices and traditional beliefs about respect, and the perishable materials they used, have left little for archaeologists to find. The most obvious artifacts are the house depressions. "If it came from the land it was burned, and if it came from the water it was returned to the water," explains Lindgren. As a result very little is known about prehistoric Athabascans.

The Kenaitze tribe believes that the excavations are only important if they add value to people's lives today. One of the goals of the camp is to expose the youths to career opportunities in cultural and natural resource fields. "My dream for this camp is to someday have the cultural resources along both sides of this river managed by one person," says Lindgren. "One day that person will be a Kenaitze. Then the circle will be complete." In addition, "I want my grandson to be proud he is Kenaitze." The campers are exposed to people who think being an Alaska Native is a source of pride. They get input from tribal elders and professionals who honor their culture. In 1998, visitors to the site included archaeologists from several of Alaska's colleges and universities, museums (including the Smithsonian), and state and Federal agencies responsible for protecting Alaska's cultural resources. The camp sets high standards prohibiting drugs, tobacco, alcohol, swearing, and disrespect. The cooperation, teamwork, respect, and loyalty emphasized by the camp are traditional values that have served their ancestors for thousands of years. "We want to build strong kids for the future," said counselor Belinda Brown. One day the campers and staff walked along the river to view a large pit that had been a ceremonial lodge. "It's just really awesome to stand on the edge of a place where you know your people have celebrated living for thousands of years."

Excavating and screening in a 2000-year-old Kachemak Eskimo occupation.



Old Records, New Stories

Ecosystem Variability and Subsistence Hunting in the Bering Strait Area

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In 1996 the National Oceanic and Atmospheric Administration (NOAA) announced its Arctic Research Initiative, a new interdisciplinary effort focused on the western Arctic/northern Bering Sea region. The NOAA-backed research program was defined as a study of the health of local ecosystems, including their natural variability and anthropogenic influences on ecosystem stability and biological resources. Terms such as “ecosystem health” and “ecosystem integrity” are increasingly used in modern policy documents and scientific publications as targets for protection efforts and management regimes. However, the notion of ecosystem health has various and often conflicting meanings from the biological, practical, and ethical points of view.

Most of the present-day scientific data and simulation modeling to test such a definition comes from highly specific marine ecosystems, such as offshore habitats under heavy exploitation by commercial fisheries, wetlands and estuaries, and/or industrially polluted inner basins (like the Great Lakes and Chesapeake Bay). Few if any contemporary large-scale studies of marine ecosystem health include indigenous people and their subsistence (or mixed subsistence-cash) economies that are highly dependent on traditional use of marine resources. Thanks to its northern focus and specific regional setting, the new Arctic Research Initiative offers a unique opportunity to introduce Native people and their economic activities as critical agents in marine resource use and in sustaining ecosystem health.

On both the Alaskan and Siberian sides of the western Arctic/Bering Sea region, Native people have lived for ages by hunting large marine mammals such as whales, walruses, and seals and by using other subsistence resources. They have developed sophisticated cultures and viable traditional economies based on intimate knowledge of and sustainable pressure on local game populations. Native hunting has played and still plays an active role in controlling ecosystem variability and population size of major marine game stocks. Understanding the present-day as well as the historical use of marine resources by Native residents of

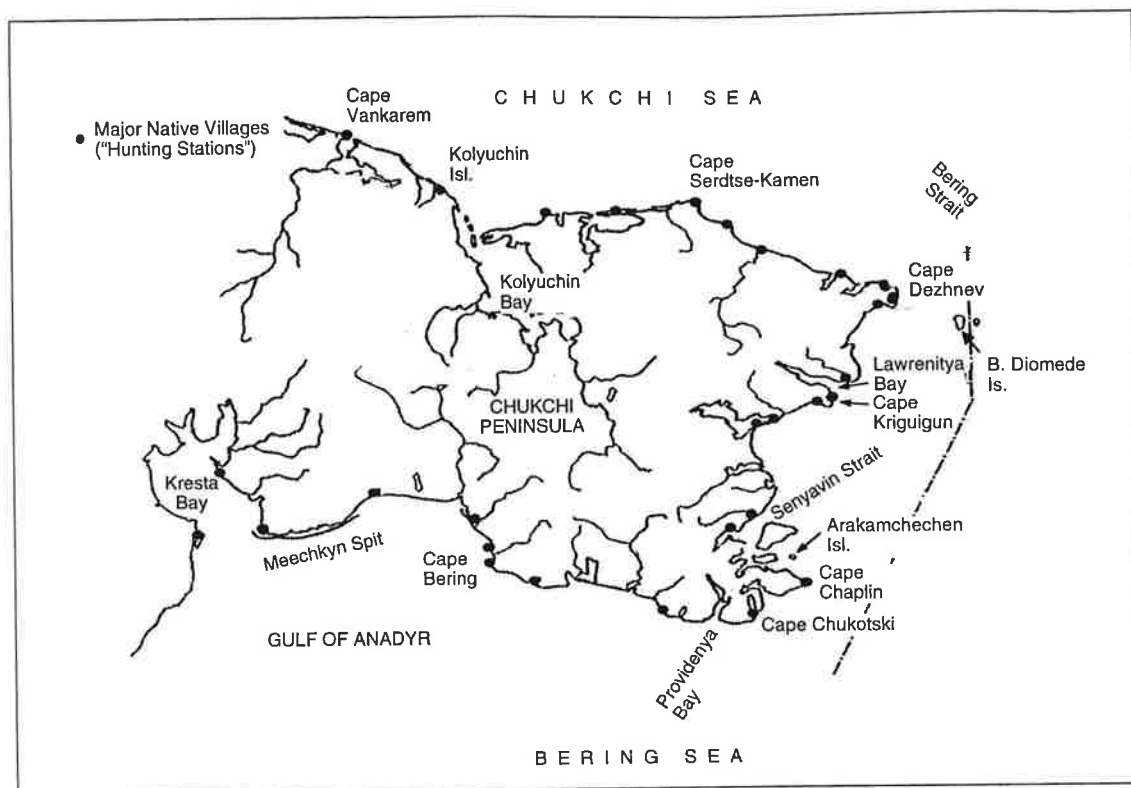
Chukotka and Alaska is critical to any assessment of the overall human impact on the Bering Sea ecosystem.

Modern literature abounds in surveys and studies showing how human impact is destroying the biotic and abiotic environment via overexploitation of commercially used species, degradation of habitat, pollution and toxic contamination, global warming, and ozone depletion. Several recent reports confirm that the current use of the Bering Sea resources by modern fisheries, mining, transportation, and other industries is very short-term oriented and can hardly be considered a sustainable regime.

Unlike modern commercial industries, Native subsistence users in the Bering Strait/western Arctic region have traditionally focused on long-term exploitation strategies that were well in accordance with the modern concepts of ecosystem health and sustainability as advanced by recent marine ecosystem studies. By diversifying their hunting pressure and using other management practices, they have allowed the area’s marine ecosystem to “maintain its metabolic activity level as well as its internal structure and organization... [and to] be resilient to outside stresses over a time and space frame relevant to that system” (Costanza 1992). The Arctic Research Initiative project described here is a historical study of Native marine catch in Chukotka and Alaska that illustrates how the introduction of large-scale economic and modernization policies triggered eventual disintegration of certain Native management practices and increased the anthropogenic stress on the western Arctic/Bering Sea ecosystem.

Focus of the research

The project, called “Ecosystem Variability and Anthropogenic Hunting Pressure in the Bering Strait Area,” was organized as a study of medium-term (“historical”) variations in the health and numbers of marine mammal populations, as these are reflected in local catch records and subsistence hunting practices of Native communities in both



Location of the study area.

the Siberian and Alaskan sectors of the western Arctic/northern Bering Sea region. Its first phase, completed in 1997-98, focused on the Chukchi Peninsula in the Siberian sector. The study targeted the period of 1920-1970, which supplies the earliest and the most detailed Russian documentary data on subsistence hunting of the area Native residents—the maritime Chukchi and Siberian Yup'ik people. Altogether some 1200 km of the Russian shoreline of the Bering Strait, the Chukchi Sea, and the northern Bering Sea were covered, an area that once had a Native population of 4500 in some 80-90 coastal villages and camps.

Because of its focus on historical documentary records and the ecological knowledge of the local people, the project addresses a critical human/cultural component within modern interdisciplinary scholarship advanced by the Bering Sea Impact Study (BESIS) and other research efforts under the Beringian Systems Program of the U.S. Arctic Research Plan. It combines the overall approach and methods of environmental science (coastal surveys, statistical assessment of game population cycles and catches, data on ice and weather circulation) and several research tools of a sociocultural study (interviews with local elders, documentation of indigenous knowledge, and the use of archival documentary records).

Our core task was to build a database of historical accounts of Native sea mammal catch on the Chukchi Peninsula organized by marine species and coastal hunting communities. The area enjoys an outstanding documentary record of Native marine hunting efforts going back to the early 1900s. This catch sample of some 70-75 years constitutes the second longest unbroken record (after Greenland) of subsistence catches for marine mammals across the entire circumpolar area. Historical data on Native marine catches were processed to model the impact of certain environmental factors (such as local ecosystem diversity, short-term climate shifts, and changing sea-ice conditions) on the health and status of marine resources. It was also used to assess the effects of modernization, resettlement, and state economic and social policies on marine mammal stocks and their subsistence use by the residents of the western Arctic/Bering Sea region.

The village and area harvest data were matched with the available references to environmental (ice and weather) conditions off the Chukchi Peninsula and information on social and economic transitions affecting local communities. In this way the study actually compared three independent sets of records for almost fifty years (1920-1970): Native harvest accounts, data on envi-

ronmental change, and records on local social and economic development.

A joint U.S.–Russian project team consisted of an Arctic anthropologist and Native subsistence specialist (Igor Krupnik) and a marine biologist and ecosystem researcher (Lyudmila Bogoslovskaya). Many local experts and residents contributed significantly to the project, particularly Nikolay Mymrin, Senior Researcher at the regional office of the Russian Marine Mammal Service (Okhotskrybvod) in Provideniya. Several Native hunters and elders from various communities in Chukotka were interviewed for the project, and a Native crew from the village of Uelen assisted Lyudmila Bogoslovskaya in her coastal boat survey in September 1997.

The setting

The western Arctic/northern Bering Sea region enjoys a variety of marine biological resources. Its critical axis at the Bering Strait constitutes one of the most productive biological “hot spots” of the entire circumpolar area. This is a key junction in annual migration routes of several marine species, such as whales, walruses, seals, colonial birds, and anadromous fishes. As the northernmost extension of the Bering Sea Green Belt, it sustains high (though seasonally and annually variable) levels of marine productivity and game abundance. The area’s residents and their marine-dependent economies had to adapt to and develop efficient ways to cope with the ongoing spatial and temporal fluctuations of the available resources.

In the most general way, local Native economies in the western Arctic/Bering Sea region were oriented towards active and sometimes aggressive use of migrating marine populations. The oldest and the most affluent Native communities along the Siberian side of the Bering Strait were located at the sites with excellent access to migrating stocks, normally during the spring and fall migration seasons. Their historical locations invariably mark areas with high biological productivity—near rocky capes, extended promontories and sand spits, active winter and spring polynyas, and lines of early breakup and constant-drift ice movement. Almost all of the largest Native communities on the Chukchi Peninsula, both Yup’ik and Chukchi, conform to this pattern. The pattern is also well documented in Alaska, where several historical Native communities followed similar ecological adaptation in pursuing seasonal stocks of migrating marine resources along polynyas, spring ice leads, and major promontory sites.

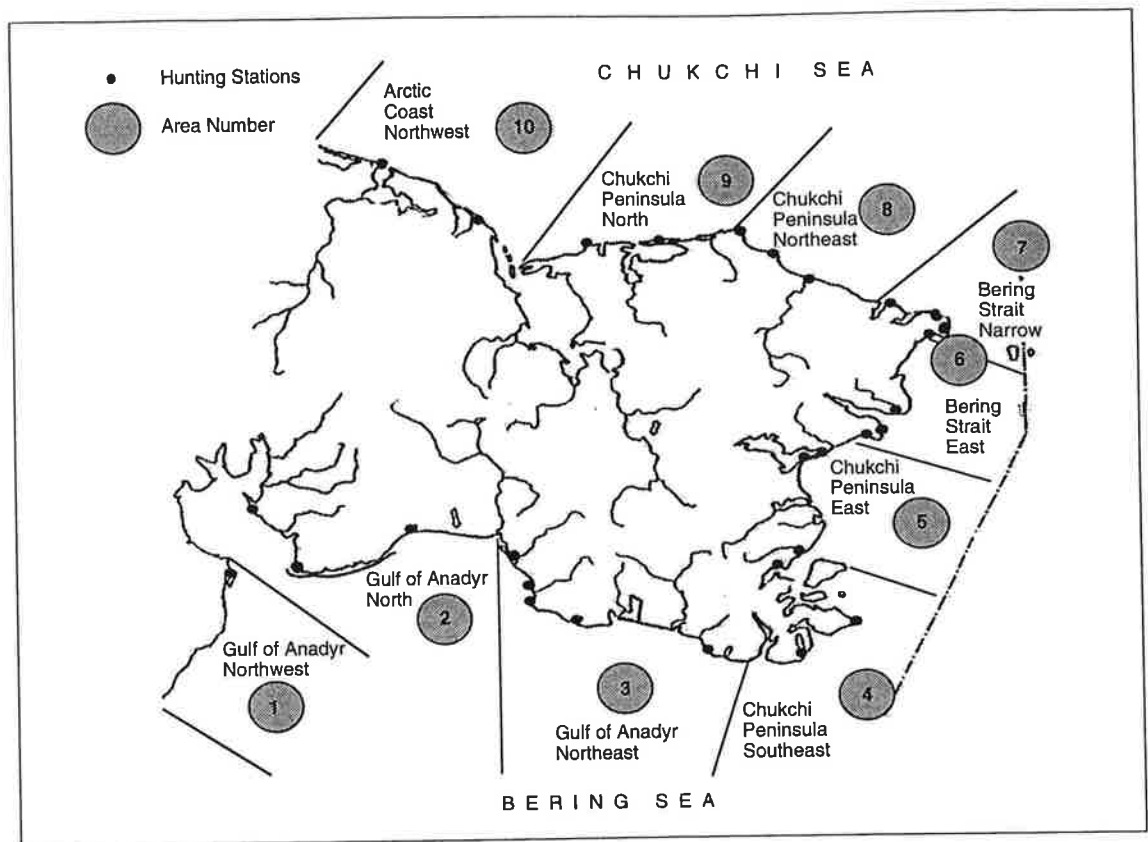
Although the area covered in this study is commonly referred to as the Chukchi Peninsula, Chukotka, and/or the Siberian (Asiatic) side of the Bering Strait, it actually embraces a much larger portion of the Siberian coastal zone. It includes a section of the mainland shore of the Gulf of Anadyr, to the north of the Anadyr River estuary (at 64°36’N, 178°30’E); the southern, eastern, and northern shores of the Chukchi Peninsula proper, between Kresta and Kolyuchin Bays; and over 150 km of the adjacent mainland Siberian coastline of the Chukchi Sea, up to Cape Vankarem (67°50’N, 175°51’W) and the Amguema River estuary. Ecologically these boundaries frame the vast region adjacent to the Bering Strait, with its specific weather, ice, and ocean water circulation regime. They also determine the area with historical and present-day availability of walruses and large baleen whales (bowhead and gray) in Siberian coastal waters, at least for a few months almost every year. Culturally the Anadyr River estuary and Cape Vankarem also mark the southern and northern historical boundaries of the area used by the maritime Chukchi and Siberian Yup’ik, whose specialized economies were dominated by hunting for large marine mammals.

The overall study area from the Anadyr River estuary to Cape Vankarem was divided into a sequence of smaller sub-areas to address the issue of local ecosystem and cultural diversity. Its three major sections can be named South, East, and North. They cover the coastline of the Gulf of Anadyr, the larger Bering Strait zone (between Cape Chukotskiy and Cape Dezhnev), and the coast of the Chukchi Sea, respectively. Beyond these major geographic divisions the study area was also organized into ten smaller individual sectors of 100–150 km each. We use the term “hunting/ecological areas” to designate these smaller coastal regions, with their specific environmental setting, combination of marine resources, and handful of closely related Native communities, with a combined population of some 350–700.

Of the ten hunting/ecological areas, three belong to the South region: Gulf of Anadyr Northwest (1), Gulf of Anadyr North (2), and Gulf of Anadyr Northeast (3). The East region includes four areas: Chukchi Peninsula Southeast (4), Chukchi Peninsula East (5), Bering Strait East (6), and Bering Strait Narrows (7). The North region consists of three areas: Chukchi Peninsula Northeast (8), Chukchi Peninsula North (9), and Arctic Coast Northwest (10).

Each hunting area has a record of the Native

*Hunting/ecological areas
used for studying local
ecosystem and cultural
diversity.*



marine mammal harvest that goes back to the years 1920–1950 and is reflected in documented catch returns of several (usually from two to five) coastal communities. Despite numerous relocations and the closing of several Native villages, each of the traditional hunting/ecological areas in Chukotka still hosts at least one Native community with active marine hunting. The products of the sea mammal catch are consumed by the village residents and are also shipped to the inland reindeer herding camps. In recent years, because of the economic crisis and shortage of imported food in the Russian Arctic, the role of Native food in local diets has increased dramatically. This makes the present survey of historical patterns in Native hunting even more critical in outlining strategies for sustainable long-term use of marine resources in the Bering Sea/western Arctic region.

Chukotka harvest database

The registration of marine mammal catch in Chukotka by Native communities was apparently introduced by the first Soviet administration established in the area in the early 1920s. Only general estimates of the overall local marine harvest were available for the years 1910–1920. The effort to

document local hunting in Chukotka was driven by the lack of reliable records on the status of Native economies. Even more important was the attempt of the new regime to maintain a sort of control over the local population through thorough and minute statistical documentation of its movement and economic activities. Village councils (*soviety*) were set up in larger Native coastal communities (after 1923–1925); these were charged with keeping accounts of Native births and deaths and of the annual marine mammal catch by major species. Some of these earliest records popped up in the various Russian publications of the time or survived as unpublished local surveys and/or annual statistical reports.

The Chukotka record of Native sea mammal catch is far superior to the existing local samples of Native marine hunting available for the Arctic regions of North America, including Alaska, where regular documentation of Native harvest, primarily for walrus, by individual communities did not start until 1958–1960. Hardly any village records exist in Alaska to estimate the marine catch for the period prior to 1950. In Chukotka the earliest records of the 1920s can also be successfully matched by information collected from the local elders, offering solid ground for the analysis

of historical changes in Native hunting efforts and in human pressure on marine ecosystems.

Starting from the years 1932–1935, ample harvest data are available in the various Russian sources, particularly for large Native villages in Chukotka. For the next five decades (1941–1991) they constitute an almost unbroken sample. Altogether several coastal areas have a 50- to 70-year catch record that usually starts in the 1930s (even in the 1920s) and extends to the 1990s. Again, there is hardly any other region in the Arctic where the marine mammal hunting by Native people has been reported with such accuracy for that long a time.

Within this Siberian database, the largest and the most reliable sample of annual catch records comes from 1935–1960. During this 25-year period, catch returns for five marine species—walrus, bearded seal, “small seal” (primarily ringed seal), whale (either bowhead or gray), and beluga (white whale)—are available for some 30 hunting stations, that is, village councils and/or hunting cooperative units (collective farms, or *kolkhoz*) established in larger Native communities. Several statistical procedures were applied to this core sample of 1935–1960. The number of sea mammals harvested annually was processed for each village, for each of the ten ecological areas, and for the three major sections of the Chukotka coastal zone: South, East, and North. Median and average catch volumes were calculated for hunting stations and areas covered by at least a 6- or 10-year-long record. Each annual catch account was also graded as high, fair, and low based on the village/area median and average deviation for certain historical periods. Correlation rates were calculated for communities and coastal sectors for the three most common marine species hunted: walrus, bearded seal, and “small seal.” The consistency in individual village catch levels was also evaluated, and a statistical connection was tested among both neighboring and distant communities within each hunting/ecological area as well as against larger coastal zones.

In addition to the correlation analysis of village and area hunting samples, actual catch numbers and village/area annual rates in hunting success (high, fair, and low) by the three main species were plotted on a series of standard base maps built for each year on record. These maps proved to be extremely useful in analyzing geographical variability in the amount and distribution of the Native marine mammal harvest. Whenever possible, data from the core sample of 1935–1960

were matched with the earlier village records of 1920–1934 as well with some later catch returns. Although both earlier and later catch figures differ from the core sample with regard to their reliability and detail, they were instrumental in expanding major outcomes of our statistical analysis over a longer time period.

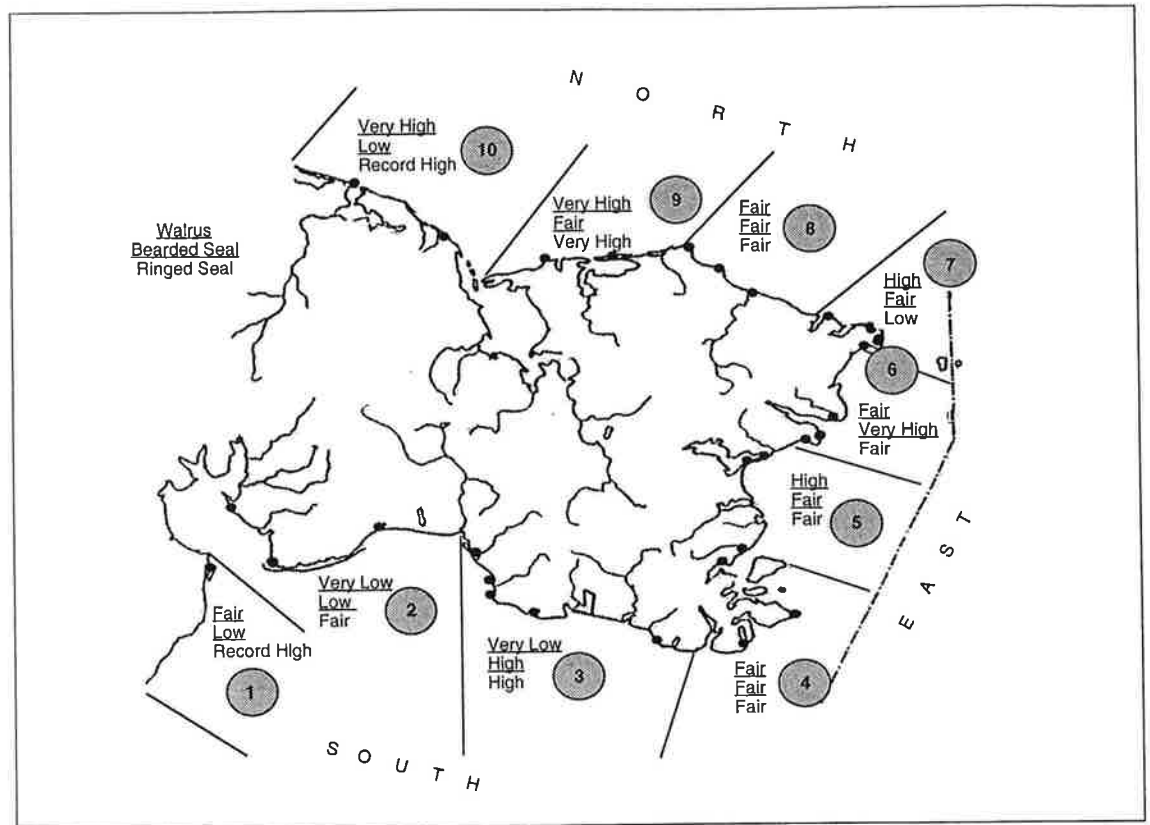
This long-term arrangement of historical catch data revealed an astounding variety in the Native use of marine resources as well as in the basic principles governing the organization of hunting efforts by local communities. Several key links among natural and social factors in ecosystem diversity were established, and many new connections can now be substantiated. The study thus contributes to a new, and far more complex, perspective on the human impact on the Bering Strait ecosystems—in terms of geography (by areas), biology (by major species hunted), and history.

On ice, animals, and catch records

Statistical evaluation of historical hunting data by Native villages and major coastal areas in Chukotka revealed a fairly regular set of annual variations in the amount and distribution of the local marine catch. Such recurrent variations were most extensively documented for the years 1936–1955, and they can be projected over a much longer time using occasional catch accounts of the 1920s as well as those of the 1950s.

By far the dominant pattern in Native catch distribution between 1930 and 1960 was an alternating North–South regime. It covers a fairly typical situation when a good walrus catch in the North (in the villages on the Arctic coast) corresponds to a poor catch in the South (in the Gulf of Anadyr area) and vice versa. In several years a similar distribution was also documented for the bearded seal catch. Within the 20-year period of 1936–1955, the North-high/South-low pattern was most visible in 1939, 1941, and 1948; the North-low/South-high pattern was typical for 1938, 1942, and, to a lesser extent, 1947, 1949, 1950, and 1953. Walrus catch records provide the most insightful and detailed data for this type of geographical analysis.

The dominant North–South pattern was interspersed with occasional years of outstandingly high or low catches for at least two major game species across extended portions of the Siberian coast. The former pattern was best documented in 1937, when nine out of ten ecological areas and 17 out of 27 sampled communities on the Chukchi



Area hunting success, 1941:
North-high/South-low
regime.

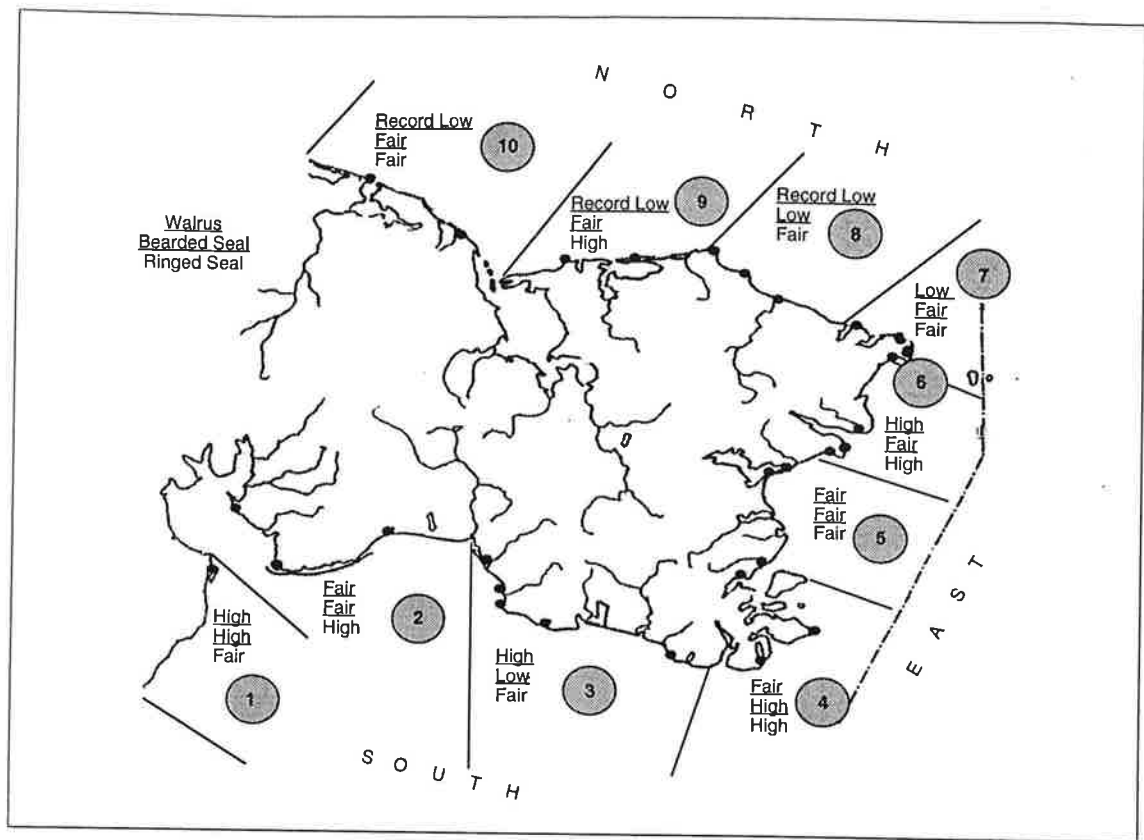
Peninsula enjoyed a record high or very good walrus catch. Six out of ten areas also reported a very good or fair catch of small seals. The same pattern repeated in 1943, when a good overall walrus catch was matched by a high or fair harvest of bearded seal in 23 out of 30 Native communities in our sample.

An opposite pattern, also marked by more or less similar hunting results across large portions of our study area, can be called an overall bad year. The worst overall catch within our core sample was in 1944. Then a low (or very low) seal harvest was documented in all ten areas and in 27 out of 30 coastal communities. Poor walrus catches in six out of ten areas and in 16 out of 30 communities exacerbated the reduced seal hunting. This combination of two poor harvests was extraordinary in both its scope and geographic distribution. Another time when the study area experienced an overall bad year for at least two marine species was in 1936.

The study indicates that these recurrent fluctuations in Native catches were established patterns. They were caused by the annual weather and ice variations in the North Pacific/Bering Sea area, particularly by the varying spring position and later northern summer retreat and fall advance of seasonal pack ice. Russian studies supplied strong evidence that the abundance, the timing, and the

very presence of walrus at the shore resting sites (haulouts) depend on ice conditions during the southbound fall migration from the Chukchi to the Bering Sea. Migrating walrus commonly haul out ashore during warm years in the North, with no or low drift ice in the Chukchi and East Siberian Seas. During such low-ice years, walrus regularly use certain sites at small islands, capes, pebble spits, and rocky promontories as haulout resting areas. This pattern was extensively documented in Chukotka in 1934, 1937, 1941, and 1964. Overall, about two dozen historical and/or current walrus haulout sites have been reported in northern and eastern Chukotka, between the Bering Strait narrows and Cape Vankarem.

During low-ice years, hunters at several northern villages have easy access to an extraordinarily large number of walrus, either offshore at close reach or at the beach haulout sites. As a result, many northern communities enjoy a much larger walrus catch than in an average year. In contrast, in high-ice summers, the area off Wrangel Island, the East Siberian Sea, and even the southern portion of the Chukchi Sea is filled with heavy drift ice. When this happens, walrus tend to leave the area earlier than usual and migrate quickly with the strong current of heavy drift ice moving southbound through the Bering Strait. Fewer animals



Area hunting success, 1942:
North-low/South-high regime.

are thus available along the Arctic coast at close reach to local hunters, and walruses often avoid northern haulout sites altogether. In such cold years the fall catch in the North is usually slim, and several Arctic villages have no walrus hunt whatsoever. However, larger-than-usual concentrations of walruses are available to hunters in the South.

As the study illustrates, both the high-ice and low-ice conditions clearly projected into the varying levels of hunting success as the availability of marine mammals at close reach, the position of their migration routes (farther from or nearer to the shore), and the abundance of animals at the most productive haulout sites were greatly affected. According to elders, in many cases, heavy ice, protracted strong winds, and storms often prevent hunters from pursuing (or even seeing) the animals for days and weeks. This may be critical during the relatively short peaks of spring and fall annual migrations, when hunters normally secured the bulk of their annual marine catch.

Thus, the annual ice regime and even the seasonal position of the drift ice edge in the Chukchi and northern Bering Sea could often be determined via high or low hunting returns at certain key communities along the coast. Here Chukotka Native catch data of the 1930s and 1940s are of immense analytical value. They precede the earli-

est North American surveys and published charts for the seasonal ice distribution in the Alaskan sector, which are available since 1953, as well as a much larger sample of ice distribution maps from the later satellite imagery era. Therefore, Native hunting records could be used as valuable indicators of environmental conditions for periods and areas with poor or no records of instrumental observations.

Annual hunting regimes: Evidence from the earlier records

The model of sustainable patterns in distribution of the Native catch in Chukotka can be tested against the isolated early catch and ice-weather records, that is, from the years prior to our core sample of 1936–1960. Some of the same patterns are clearly recognizable via patchy evidence and documentary sources of the 1920s and 1930s.

For example, in the summer of 1932, very heavy drift ice was reported along the Arctic coast of Chukotka. The northbound walrus migration in the Chukchi Sea was arrested by the solid drift-ice barrier positioned at Cape Serdtse-Kamen. Walrus hunting in the villages of Naukan and Uelen did not start until late June or July, and the summer

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walrus catch, as well as the total for the year, was extremely low. No walruses were reported in the fall on the beaches at Cape Incheon at one of the largest local haulout sites. On the contrary the spring hunting for ringed seal was very good, and over 1000 ringed seals were killed in Naukan during May 1932. This is typical for the North-low/South-high hunting regime (with an ice-weather pattern that is cool in the North and warm in the South), with late ice breakup, heavy drift ice in the Chukchi Sea, no walruses on fall haulout sites, and a higher-than-usual number of ringed seals killed in the North to compensate for the poor walrus catch. As expected, it corresponded to a fairly good walrus harvest in the Gulf of Anadyr, along the southern shore of the Chukchi Peninsula. We recognize the same North-low/South-high (North-cool/South-warm) pattern in Native catch distribution in 1922. Then the total reported walrus harvest in the North trickled to 175, and not a single walrus was killed in any of the villages west of Kolyuchin Bay. Summer navigation in the Chukchi Sea was very difficult. Heavy drift ice blocked access to Wrangel Island and sealed the Bering Strait in September. However, a fairly good walrus catch was documented in 1922 in the East, around Lavrentiya Bay, and in the South, in Kresta Bay, at Cape Bering, Cape Chaplin, and Provideniya Bay.

The opposing North-high/South-low regime can likewise be identified via the distribution of documented Native catch in 1926 and 1928. The year 1921—one of the earliest on our record—illustrates a similar pattern. The walrus catch in the North (over 1000) was even more successful than in 1926; some 200 walruses were even killed far to the west in the East Siberian Sea at Cape Shmidt, at Cape Billings, and in the Chaun Bay. This unusually high walrus harvest along the Arctic coast implies low or no drift ice in the North, as indeed was documented by the ice-free summer navigation in the Chukchi and East Siberian Sea. In accordance with this North-high/South-low pattern, walrus hunting was very poor in the villages around Lavrentiya Bay and in the south.

A few extraordinary years can be similarly traced during the 16-year period that precedes our core sample of 1935-1960. An overall bad year reportedly prevailed in 1930, when walrus hunting was extremely poor across most of the Chukchi Peninsula. Because of bad (cold?) weather in the fall, walruses did not haul out at their usual largest resting sites near the village of Incheon and at Arakamchechen Island. Our best evidence for the overall good year comes from 1934. Then, a record

high and/or a very good walrus catch was reported in the South and East. In addition, hunting was presumably very good in the North, as the walruses crowded out at several beach sites on their fall migration. This occurred in conjunction with an outstandingly warm (low ice) summer and fall along the Arctic coast of Chukotka. The record high overall walrus catch (over 6000) was also backed by a very successful bearded seal harvest (2500).

These and similar specific annual patterns in the distribution of Native catch in Chukotka in 1920-1955 and beyond offer critical insights into documentation of the key links among the physical environment, marine biota, and human use of marine resources. They are valuable clues to the era that predates available ice-weather samples commonly used by North American physical scientists. They also prove that data on the historical marine catch by Native villages can indeed be indicative of specific annual ice-weather conditions. As previously classified Russian ice charts and meteorological observations for the pre-satellite era of 1930-1968 become more available, we may eventually build a comprehensive model of environmental fluctuations in the western Arctic/northern Bering Sea region. This will help to establish the frequency and/or regularity in the annual ice-weather regimes that controlled marine ecosystem resiliency and variability in Chukotka Native hunting during the first half of this century.

Major project outcomes

As this study illustrates, when certain human-environmental relations are transformed into statistically sound connections, the old harvest data offer reliable indicators of short-term fluctuations in ice-weather conditions and in the overall ecosystem health, particularly for the periods and areas with poor record of instrumental observations. Christian Vibe once pioneered this approach in his 1967 study of Arctic animals in relation to climatic fluctuations in Greenland. For the western Arctic/northern Bering Sea region, Chukotka hunting accounts for the pre-1953 era are of particular value. Here an alternating North-South opposition in the distribution of drift ice, prevailing winds, seasonal migration routes, and availability of marine mammal stocks to Native hunters can be recognized as the dominant pattern in interannual dynamics in local ecosystems.

The issue of direct interdependence between the Native catch data and stock health and/or overall

size is far more controversial. Earlier studies usually linked drops in hunting returns to overexploitation and related population depression of the game stocks and vice versa. Our analysis of historical data on long-term trends in Chukotka Native marine harvests revealed an outstanding role of many more social and human factors other than stock overhunting. These include governmental policies, introduction of certain conservation measures, hunting quotas and/or economic incentives to increase harvest, success of village modernization programs, and adequate (or limited) supply of hunting equipment and ammunition.

Recent drastic declines in hunting returns documented in many Native communities in Chukotka after 1992 are just another example of a predominantly social depression, as local hunters unanimously cite the shortage in gasoline and ammunition as major causes in their catch slide. Similarly, between 1940 and 1970, several Native villages were closed in Chukotka, due to the government resettlement programs, and their residents were relocated to larger modernized communities. Each time a village was closed and its residents resettled, the combined Native marine catch usually dropped in half in relation to the same (or even larger) human population.

Marine biologists are currently focusing on specific biological evidence other than sheer numbers of animals observed, in order to estimate the status of the marine game stocks. These include decreased fatness of animals killed, change in their diet (as seen from the stomach content), increased natural mortality, decreased productivity and calf survival, etc. Native hunters use their own indicators, such as the unusually high number of animals with skin and internal diseases, the proportion of walrus with broken and heavily worn tusks, the availability of animals at their usual hauling and breeding grounds, etc. These and other similar sources of evidence could hardly be extracted from the historical catch records. However, if a healthy marine population (like a healthy ecosystem) can be defined as one "being able to maintain organization and autonomy over time and its resilience to stress" (Haskell et al. 1992), the old records did offer valuable clues to make the judgement.

We believe that recurrent fluctuations in annual catch volume in response to certain patterns of ice-weather conditions—such as the alternating North-South hunting regime documented in Chukotka during the years 1920–1955—is among the strongest evidence so far of sustainable and

healthy marine stocks. As long as the animals can quickly change their habitat and areas of seasonal concentration, and/or are able to return in abundance following a shift to more favorable conditions, the stock looks healthy. It displays successful adaptation to periodic environmental (as well as human) stress. Dunbar (1973) once advanced this use of very large habitat as the key mechanism for stability and strength in Arctic game populations and ecosystems. On the contrary, the loss of ability to return in great numbers or to utilize certain portions of the former habitat for recuperation is the strongest evidence of significant if not dramatic population stress.

Another source of evidence of a healthy ecosystem, or at least of a sustainable use of marine resources by subsistence hunters, is a compensatory opposition of certain game species in the annual harvest. The best example was the opposition between the walrus and (ringed) seal catch that was amply illustrated by the numerous Chukotka village returns during 1930–1955. However, this opposition all but disappeared after 1960. Then the walrus stocks off Chukotka diminished due to overhunting and shifts in migration routes, and the seal catches gradually slipped, following governmental closure of several Native communities and the state-introduced transition to a more commercially oriented economy.

As old village records indicate, migrating walrus and bearded seal stocks could shift their seasonal habitats dramatically and often very quickly in response to harsh ice-weather conditions or increased human exploitation. Thus, in a healthy Arctic ecosystem a good annual catch level can often be several times higher than the poor one. Whether due to the availability of animals or because of the easy (or hard) access for hunters to game stocks at critical junctions, such high swings in human intake are commonly regarded as quite natural. However, the pressure of human hunting can be seen as sustainable as long as the catch fluctuations follow a certain established pattern and the animals keep returning in great numbers. Thus, our study of the Siberian hunting records supports the Native perspective on game population change. Unlike marine biologists, who commonly address the stock dynamics as the product of population cycles and human overexploitation, local subsistence users view marine game fluctuations as periodic or induced changes in habitat and distribution patterns. According to hunters, when the animals are scarce, they are gone but never down.

Future research directions

The most valuable core of our database on Chukotka Native marine hunting refers to a period between 1920 and 1955. It offers the best and evidently the most substantial grounds for modeling more traditional forms of subsistence use of marine resources as well as for connecting Native hunting for sea mammals to local ice-weather regimes and short-term environmental fluctuations. However, certain trends related primarily to social factors in human-environment interaction in the area (such as changes in population distribution and hunting pressure via governmental resettlement and/or modernization policies) became established after 1960 and even after 1970.

Thus, expanded focus on the more recent decades of 1960-1990 is the key task for the second phase of the project. This period would also bridge our survey with the present-day social and economic situation on the Chukchi Peninsula and would offer links to many ongoing biological studies in ecosystem diversity and the status of marine mammal stocks in the Bering Sea/Bering Strait region. Securing further geographic extension of the study area is even more crucial. A similar database of Alaskan village hunting returns is under construction by Henry Huntington (subsistence hunting specialist from Anchorage, AK) and Igor Krupnik. Unfortunately one could hardly expect the harvest records to be fully compatible for the western (Chukotkan) and eastern (Alaskan) sector. Regular documentation of the Native subsistence hunting in Alaska (beyond bowhead whaling) did not start until after 1960, that is, almost 40 years later than in Chukotka. Nevertheless, 20- to 30-year-long village harvest samples could be secured for several Native Alaskan hunting communities on the North American side, such as St. Lawrence, King, and Diomed Islands, the Seward Peninsula (Wales and Shishmaref), and along the Alaskan Arctic coast (Point Hope, Wainwright, and Barrow).

Matching the records from the two sides of the Bering Strait will be strategic for understanding the ecosystem dynamics, changes in marine mammal stocks, and migration routes in the entire western Arctic/northern Bering Sea region. Of course, human subsistence hunting is profoundly affected by the varying state policies, economic systems, and national game protection regimes. But the animals themselves do not recognize international boundaries and never ask for visas on their migration routes. Political borders are even less relevant to the changing timing of spring breakup or posi-

tion of the sea ice edge (though they are quite relevant to the ways these data are collected, shared, and disseminated). Therefore, we see our study of the historical Native marine harvest in Chukotka as the first step in integrating scientific knowledge on ecosystem variability and marine population health across the larger Beringian zone that is still fractured by the language, political, and institutional divides.

The main challenge here is to assess whether the two geographic (as well as political) sectors of that zone operate as a single unified environment and whether it could be illustrated by a common analytical model to cover the entire western Arctic/northern Bering Sea region. Perspectives, research methods, and basic hypotheses developed for the Chukotkan sector could be then checked against comparable data on Native Alaskan subsistence harvest. These issues are at the core of the second phase of the project scheduled for 1998-2000.

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Place-Name Studies from the Saniq Coast

Shishmaref to Ikpek, Alaska

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On the surface the study to which this essay refers is about Inupiat Eskimo place-names on land and in the nearby sea in regions surrounding the village of Shishmaref, on Alaska's Seward Peninsula. Many studies of place-names have used a material, somewhat antiquated approach to the collection of toponyms. In that type of research, place-names are collected as objects, presented without deep texture—often without context. In actuality, general Inupiat knowledge and personal Inupiaq narratives virtually electrify each named place. A boat trip down the Saniq coast toward the village of Wales, our present study area, tells this: as wind and water thrash us, the boat captain narrates the shape and history of the land to an Inupiaq collaborator. He does so continuously; this is not for amusement—he is teaching. Each named site, even if it has washed into the sea, is revealed as a holistic conglomerate of present-day activities, Inupiat history, associated genealogy, traditional beliefs, and moral lessons.

The land has names, be it on the coast or inland, but we are beginning to forget these names. The days are here when we are starting to forget the names of the land; the period of forgetting the names has already begun.... Many do not know the place-names that we [elders] know.... Before, a person might not know place-names in a certain area, but a person who does know them would add to the knowledge.... Many people have forgotten the place-names of the land and, also, natural erosion has removed many of these sites to where you can no longer see them. Sites along the coast with names are no longer there.... When we do cite place-names of those removed by erosion, we still mention the name of the sites, even though they are no longer there.

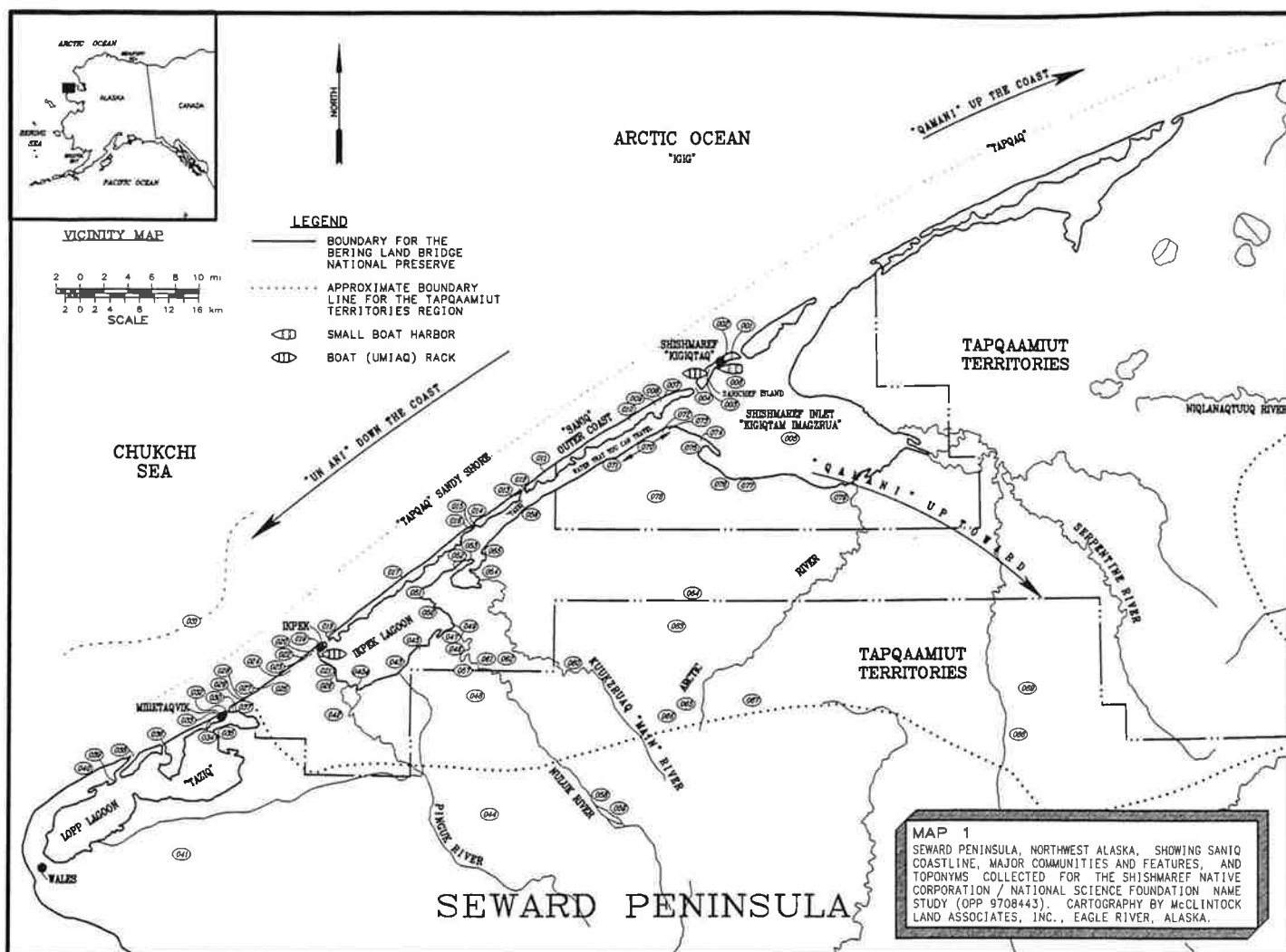
—Davey Ningeulook, Shishmaref, 1997

Our National Science Foundation research, conducted with the Shishmaref Native Corporation, integrates oral history with professional mapping, and it will produce several volumes about place in the area, fuel scholarly papers and presentations, and, we hope, result in a community-based film. The life history of an accomplished Shishmaref elder, polar-bear-hunter Davey Ningeulook, will also be continued and expanded, for eventual publication, during this study.

Our study focuses on how Inupiat in Shishmaref and areas west along the Saniq coast, people previously known as the Kigiqtaamiut, Ikpekmiut, Miġetaqvikiut, and Agugvigmiut (there may be other local designations for “the people of” not yet recorded), name places in their region, how they affect and use these places, and how they transmit place-related information. Data about place and the uses of it tells much about Inupiat worldview, for naming, performance, genealogic ties, and history are intertwined dynamically in the act of place-naming and the retelling of toponyms. Toponyms, also, are still being invented. This is an explicit, creative process, and in the high-context environment of a small village, expressivity is shared.

For an outsider, however, there are many problems in the study of Native toponyms. Equal to the common lack of recorded context is a pervasive inattention to differences in pronunciation and orthography between dialects and to the reshaping, invention, and outright loss of names that occur within Native groups and from pressure on them to acculturate. These processes and conditions are present in the Saniq area as well. One ethnonymic transformation, pointed up by Ives Goddard, is the creation of “ghost forms,” words (in this case toponyms) that previously did not exist and may “obliterate genuine archaic features” of the name. In the Shishmaref area, an example of this phenomenon is Nuizhaakpak, which means “to come into view” or “big cloud.” Recently this site has been given an Inupiaq nickname, the root word Nuyaq, and an English ghost name, New York, because the original toponym is difficult for local non-Inupiaq speakers to pronounce. For young Inupiaq, the nuances of the name have been lost and it is now a ghost of the original.

Translations of Nuizhaakpak collected at different times may refer to folktales that are now lost, for the root word, Nuyaq, means to be cautious about potential harm, or more correctly, says Herbert Anungazuk, “to naturally take caution in approaching a known inhabited area, in this case, Shishmaref.” Stories about another site may provide clues, for the “big cloud” may be a weather



Seward Peninsula, Alaska, showing Saniq-Saniniq coastlines, major communities and features, and select toponyms.

phenomenon created by shamans in the past to hide villagers (or enemies) before they could be seen and attacked. Yakpatakgaq, for example, is a site near the mouth of Nuluk River. Oral history associated with the abandoned village tells of a surprise summer attack by Siberians that was facilitated by a dense fog created by a Siberian shaman.

The people

Shishmaref elders, like many Native Americans, refer to themselves and their kinsmen as “real people.” When telling stories about their ancestors, some collaborators say that many narratives were handed down from the “first people” of the region—Inupiat—or “genuine real people.” According to Ernest Burch, Jr., the Inupiat groups of northwest Alaska were traditionally divided into eleven nations at mid-nineteenth century, after which increased European contact, disease,

and migration fragmented the unity of each. One of these nations has come to be known as Tapqaq or Tapqaamiut (“the people of Tapqaq”), whose place-name structures I examine here. Tapqaq, or “sandy shore,” was never the designation used by local people, despite its common usage, and the Tapqaamiut did not think of themselves as a single society in times past. Inhabitants of small area communities, in fact, sometimes feuded bitterly with one another. The term was a name for them used by other Inupiat groups, as was Saqmarliagruk, “the people down under” (used by Inupiat living north of Point Hope). Instead, Inupiat family groups of the Saniq region referred to themselves as “of” the name of their winter settlement: Kigiqtaamiut (from Old Shishmaref) or Ikpekmiut (of Ikpek). These small semi-permanent winter “family tree settlements,” as they are sometimes called, served as base locations while families moved seasonally to exploit subsistence resources.

The Tapqaamiut speak several Inupiaq sub-

dialects. In present-day Shishmaref, speakers of the Ikpekmuit, Kigiqtaamiut, Qividlumiut, and Pitaamiut (Pimiuli) dialects can still be identified. Dialectical differences in the region are often very subtle, yet a misinterpretation of the meaning of a geographic area may disable a traveler who doesn't understand the "lay of the land" or sea. Place-names are obviously linked to the dialect

Arctic River, there is always someone there too, so they call those people Agugvigmiut.... Each area had an old site and there is always some people that's been living there. The people are called by the landmark's name.

—Gideon Kahlook Barr, Sr., 1987

spoken by particular informants, although two project translators know several sub-dialects and have attempted to identify the affiliation of speakers throughout.

Regional expert Charles Lucier says that geographical and societal identities were virtually inseparable for the Inupiat; river drainages and discrete parts of such areas often functioned as societal boundaries. Local and extended families would thus have been interchangeable, in a sense, with sites themselves. Our research in Shishmaref confirms this: collaborators divide mapping and analysis into three major sections including:

- The Saniq coast and interior west of Shishmaref nearly to Wales, which was an allied village;
- The Serpentine Flats and upland regions; and
- The coast east to Cape Espenberg including mountainous areas and portages leading into the Inmachuk and Niqlanaqtuuq ("place with brants") river drainages.

Deceased Shishmaref elder Hattie Ningeulook spoke of land another way, putting it in Inupiat terms by saying "the earth possesses" her people. She meant, literally, that people here cannot be separated from earth and sea without giving up their identity. Such identity is configured in several ways: individually, around extended family kin-groups, and for people throughout the region as a whole, especially for those who now live in hub communities. In the past, the latter would have been referred to as an Inupiat nation.

Context: Saniq–Saniniq lands

A long strand of windswept barrier islands, saltwater lagoon systems, and beaches lace the coast for over 100 miles between Cape Prince of Wales and Cape Espenberg. Contemporary Shish-

maref is situated on one of these barrier islands, Sarichef Island (locally known as Kigiqtaq, literally, "island"). "Old Shishmaref" was first explored by Otto von Kotzebue and his party in 1816.

Across the many lagoons that separate islands from mainland, the coastal lowlands undulate gently, sparkling with tundra thaw lakes and string bogs. Each low rise gives navigational guidance or bears meaning for Inupiaq travelers; some of the toponyms for these features may have been in use since prior to Kotzebue's contact with the area. Several large rivers along the Tapqaa coast drain into the Chukchi Sea or into the lagoons, including the Nuluk, forks of the Serpentine, Aaghuqviiq (Arctic), and Espenberg. Beyond Cape Espenberg, along the shores of Kotzebue Sound, major drainages include a large, important estuary formed by the Niqlanaqtuuq River as well as the Goodhope, Pish, and Inmachuk Rivers. These waterways, all used by local residents, provide freshwater fish and anadromous salmon, and they serve as transportation corridors into the interior. Nearby lowlands teem with waterfowl from spring to fall. Caribou once populated the uplands, and although these animals left this part of the Seward Peninsula in the mid- to late-1800s, they have returned in many areas. Both ocean and lagoons supply a variety of seals and occasional pods of beluga whales; the favored marine mammal hunted in Shishmaref, however, is the ugruk (bearded seal).

Once one rounds Cape Espenberg, east of Shishmaref, the coast southeast to the vicinity of Deering is referred to as Saniniq. The entire Saniq coastline is extremely dynamic, while the Saniniq side is protected somewhat from the open ocean. Because the barrier islands have almost no vertical relief, there is nothing to moderate Arctic winds, and the sands are moved, redeposited, and built up intermittently by wave action. Particularly forceful storms sometimes roll in from the north and west, bringing devastating floods that erode shoreline cliffs, sweeping away the ruins of old settlements and threatening modern villages.

During the fall of 1997, for example, Shishmaref was hit with a dramatic storm that endangered at least a dozen homes and eradicated traditional foods stored in underground caches. These lands shift perpetually, and although the Inupiat have long since adapted to that, the present-day infrastructure of Shishmaref makes it difficult to contemplate a move en masse to another location, although this may soon be necessary.

Overall, four distinct biological–geographical types of terrain are represented on the Seward



Shishmaref elder Lola Avessuk, who nearly lost her home to the sea during a violent storm in October 1997. Avessuk's house, along with others, is being moved to a new location, but there is little land appropriate for development left on Sarichef Island. The community wants to stay but may ultimately be forced to move to a mainland location.

Peninsula. They include the Shishmaref Lowlands, the Uplands, the Kuzitrin River Basin, and the Imuruk Lava Flow. The entire region is a part of the intermontane plateau system; it is dominated by an alpine tundra ecosystem based atop deep permafrost. Although the area is located technically in the sub-Arctic, Shishmaref weather is harsh and unpredictable. Less than two feet of snow falls here in the average year, but winters are long and dark. Freeze-up is usually complete by mid-December, and although winter temperatures average between -12 and 7°F , the wind chill is often much colder.

Numerous geothermal events, periods of glaciation, and the geographical features that resulted from these events make the area unique. The elevation of the coastal plains is consistently about 300 ft above sea level until about 25 miles inland, where the land slowly ascends to foothills, then becomes ruggedly mountainous. The summits and flanks of the tallest mountains in the region are used by local hunters for weather prediction, game spotting, various subsistence activities such as ground squirrel trapping, and, at one time, traditional caribou drives. Some upland areas are extremely barren, yet were used and inhabited—at least sporadically—during aboriginal times.

Along the Saniq coast west of Shishmaref, our first-year study area, several coastal communities, including Kigiqtaq, Sinqazaat, Ikpek, and Milfetaqvik, were relatively large during traditional times, with as many as 50–80 residents. Each traditional settlement had been located in an area crowned with names and infused with kinship relations of critical importance to its members. These communities and others were abandoned,

beginning in the mid-1800s, for various reasons. Residents of Sinqazaat perished long ago from eating tainted beluga whale meat. Old Shishmaref, Kigiqtaq, was destroyed during historic times by warriors from Mary's Igloo while residents were in the qazgriit enjoying winter festivities. Milfetaqvik was devastated by the 1918 global influenza epidemic, as was nearby Wales.

Ikpek, settled by the Olanna family, was the traditional Saniq community to hold out longest. As itinerant missionaries began to travel the area, residents there began to convert from traditional to Christian faith, however. Ikpek families lobbied for a school of their own but it was never built, and many people there kept their children out of school on a seasonal basis while they hunted and trapped. In the 1950s the last remaining families moved from Ikpek to Shishmaref and Brevig Mission because there were churches, schools, and stores there, and Ikpek was converted to a seasonal camp and Native allotment site, albeit a significant one.

Shishmaref became the hub village for the Saniq coast as well as for the Serpentine Flats region and the coast east to Cape Espenberg. As this occurred, former coastal residents brought with them Inupiaq dialects and sub-dialects, affiliations with settlements that had not always been friendly with Kigiqtaq, and distinctive origin stories, folktales, and personal and historical narratives about place, as well as attachment to and knowledge of the toponyms that accompanied them. The system of barrier islands, however, is fragile. Neither Sarichef Island, nor any other area coastal, island, or bluff mainland locations, have ever been stable enough to support major communities with large infrastructures. Today, Shishmaref has grown to nearly 600 people, and many of its homes and food storage areas are threatened. In time, commercial and government buildings, the airport, boat landings, and the school will also be in jeopardy.

The regions discussed here are now situated within the boundaries of the Bering Land Bridge National Preserve, an area of roughly 2.75 million acres managed by the National Park Service. The historic and majority of residents here are Inupiat, although the region is now designated for "multiple use" by (mainly) non-Native administrators. Uses include Native subsistence hunting, gathering, and fishing. The "wilderness suitability review" conducted when the preserve was established concluded that all Federal lands in the preserve were eligible for wilderness designation. The Inupiat and their ancestors have walked, used, and

named these lands for thousands of years. As a result, they find the “wilderness” designation a somewhat silly—and not completely desirable—turn of events.

Land as Inupiat text

The essence of Inupiat worldview regarding land is one of stewardship, not private ownership; lands are to be held in honor of generations past—with respect for the land itself—and for future generations. Traditionally no single individual can alter or attenuate this circumstance.

Land in the Tapqaq region functions clearly as a text for those schooled in reading it. And reading it depends on knowing the names it has been assigned and the information associated with those names. Such information is transferred verbally and is usually contained and transmitted within extended families. Among the Inupiat, place-names are most often metonymic; that is, they point up the attribute of a site rather than assigning metaphor to it. Metaphors are of little use to a people who must know precisely the texture and quality of ice or the moment when the ugruk have arrived.

Place-name texts bolster family and community solidarity by reaffirming former boundaries of dialect and extended family. In addition, they record important events in local and regional Inupiat history and identify land use, including proprietary use. Historical tales associated with place in the Tapqaq region and nearby areas refer to migrations, wars, abductions, and famines. Such disruptions would undoubtedly have affected the acts of remembering or discarding certain toponyms. Place-names themselves, given these circum-

stances, would serve to remind people today what it was like to be Inupiat during historic (and perhaps prehistoric) times.

Our research indicates that land, for the Inupiat, is an entity much like a person—a distinctly animistic viewpoint. The Earth itself can speak, and one of the ways it has spoken and continues to narrate Inupiat experience and worldview is through the act of place-naming. A number of tales collected from this region refer to persons actually traveling through or being within the land, rather than existing upon it, as Westerners do. The fact that most Kigiqtaamiut are now devout and enthusiastic Lutherans does not diminish traditional beliefs about the nature of land, their relationship with it, or the importance of toponyms. When Inupiat persons talk, they sometimes refer to places that speak and to their own conversations with animals.

The patterns associated with place-naming appear to be affiliated closely with the following themes or with combinations of them: geography, subsistence hunting and gathering, kinship and social structure, local history, personal experience, and Inupiat beliefs. There has been some disagreement as to whether a place could be named after a personal Inupiat name during traditional times. Dorothy Jean Ray states that such a practice would cause conflict with the person’s name soul, while Ernest Burch, Jr., asserts that many places on the Seward Peninsula and elsewhere in northwest Alaska were “explicitly named after individuals (as opposed to accidentally having the same name).” The latter appears to be the case in the Shishmaref area. Deceased project collaborator Edgar Ningeulook, for example, was named Nuna-geak, after a small river near Cape Espenberg.

The main street of Shishmaref in the early 1920s, when it was beginning to have a different look. At right is a semi-subterranean “iglu house” that belonged to the Bert Wicksock family, while on the left stands Esau Weyiouanna’s progressive lumber house, buttressed with sod. In the background is the frame schoolhouse and teacher’s residence, built by Edward and Toni Keithahn and local residents in 1923.



Inupiat toponyms and associated folktales underscore human ties with earth and destiny. They provide predictive models of what it means to be Inupiat. One of the sites best known to non-Natives in this area lies in the uplands: Iyat, or Serpentine Hot Springs (“cooking pot”), is surrounded by dramatic volcanic tors, themselves the subject of folktales. A well-known ritual associated with Iyat is the practice of dipping mukluk ties into the hot springs water to predict their wearer’s life span. If the strings curl, the life of the wearer will be short, and often, say area residents, this is the case. The locality was also used as a shamanistic initiation site. Shamans transported unwilling apprentices there from Shishmaref by “out of body” flight and required them to undergo harsh training through layers of permafrost. How this initiation transpired is unclear, but it required that a person undergo immersion in the winter earth and come to regard it as both opponent and mentor.

Place-name classifications

My work with Shishmaref collaborators has led me to identify several types of place-names. While initiating research for a related National Park Service project, I first reviewed known existing audiotapes (including folktales) and literature about the locality and found that many contained place-names and references to place. Some of these audiotapes had been compiled for implementation of the Alaska Native Claims Settlement Act (ANCSA). Edgar Ningeulook and I then recorded many more toponyms and the tales, incidents, and meanings associated with them. Our work led to a cooperative agreement between the Shishmaref I.R.A. Village Council and NPS

Sealskins pegged out on the tundra near Shishmaref to bleach pure white, often referred to as “winter-bleached sealskins.” Sites of hunting and processing activities such as this give rise to the type of place-name called activity toponyms. Peg-sites are important family property, the kind of site, often hard to find, that is used for generations and often overlooked by non-Native users of the land.



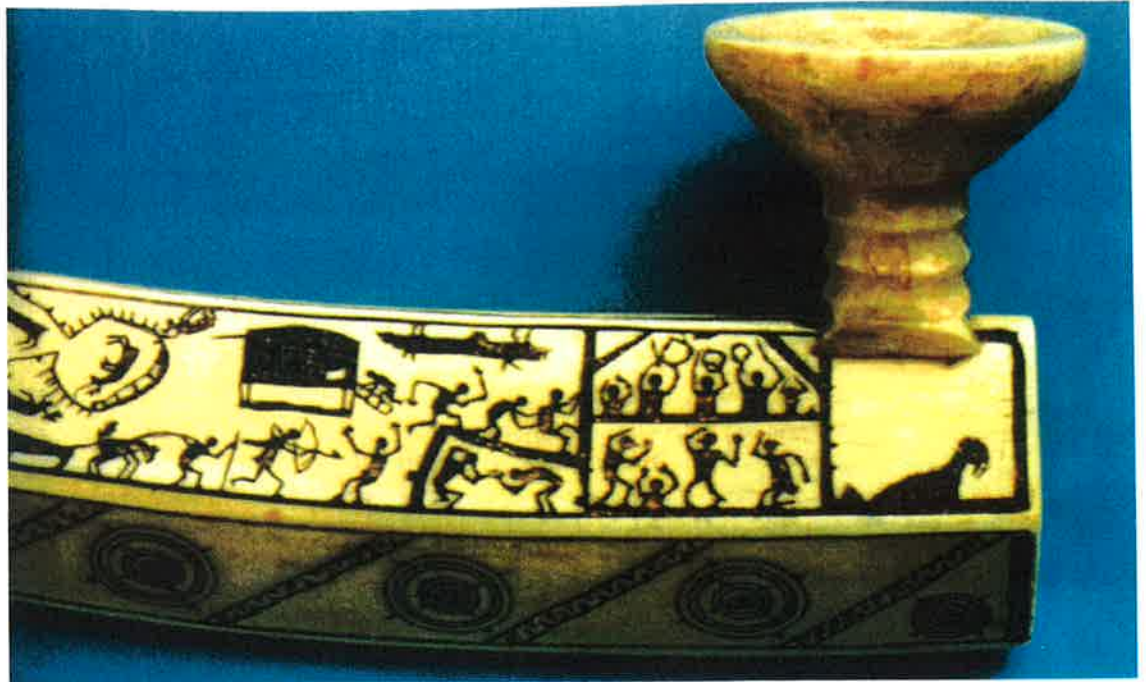
on the same subject, then to our greatly expanded National Science Foundation research with the Shishmaref Native Corporation.

Place-name classifications identified to this point include descriptive or geographic toponyms associated entirely with a geographic feature. One might think these would be the most common type of name, but they don’t appear to be so. There are also a number of generic descriptive toponyms affiliated with areas such as portages, mud flats, caribou drive areas, and cliffs. Closely related to the descriptive toponym is the activity toponym, which is associated with endeavors conducted at a particular site. While this type of toponym may reflect geography, activity, or both, what it usually calls up for a local person is a seasonal performance (often a traditional economic pursuit) or historic event associated with the site. Nunivliq refers to any productive berry-picking place, for example, although such a place may also bear a more specific toponym.

Because many actual sites are now abandoned or have eroded into the sea, associated toponyms and tales sometimes substitute for place itself. Such a place-name remains alive, tied to and perpetuating Inupiat morals and beliefs. These toponyms are memory names. As Gideon Kahlook Barr, Sr., said of one such place: “It’s no longer a river anymore in these days. So, it’s just an old site—which becomes just a story.” River, site, place-name, story.

Within the local family, tales were and still are told by individuals about their ancestral localities. They define *this* family as shaped by *that* place. Toponyms of this type are family texts (often related as personal narratives.) There are several types of family texts. They include those that point to a particular heroic ancestor, tales that draw attention to an important event in family history, memories of incidents in the life of a single family member (historic and present-day), and those that tie specific families to mythological beings and their activities. Some tales serve as national creation texts, bolstering the identity of many people. These names are mnemonic devices for defining particular Inupiat nations and extended family groups from outsiders. The lines here between myth (the story of how we came to be as a people or how this land was formed) and legend (the historicity of an event) are blurred.

The Ilaganiq tales, for example, are a small corpus of now-fragmented stories once told by elder Gideon Kahlook Barr, Sr., and his sister, Bessie Cross. “The place where I will start is an



Inupiat walrus ivory pipe, circa 1870–1900, showing a motif often discussed in area oral history. Villagers were often attacked in winter while dancing in the qazgri, as happened in old Shishmaref (Kigiqtaq). Here, drummers and dancers are unaware that kinsmen are falling to enemy hands outside and in the duqshuq, or semi-subterranean entryway. One person is escaping into an elevated storage cache in back.

old iglu site (homesite or small community) at Cape Espenberg. This man's name, Ilaganiq, it's the story. His home was right at the tip of Espenberg...." As told by Barr, the Ilaganiq creation story tells of a strongman—an institutionalized Inupiat male role—related to the Barr family far back in time. The young man, who remained at home to care for female relatives, began to terrorize area hunters. On trips north, he forced men time and again to give up all their hard-won caribou skins. They finally ended their subservience by stuffing Ilaganiq and his skins into his departing kayak so

A large whale skull marking the family homesite has been moved several times by Barr ancestors to save it from encroaching seas, just as a curator maintains an important collection or public monument. Thus, the mythological aspect of the tale ties these people to the creation of their land and to superhuman kinsmen, while the legendary components of place-names at the cape refer to Ilaganiq, who is at once strongman (an admirable type of man), hero (one who can support many), and bad man (one who does not share). The message of the tale to today's Inupiat listeners is to emulate Ilaganiq's good qualities and powerful traits while bearing in mind the not-so-admirable faults that caused his death.

People always look for lots of berries, that's why they always go further up and further all the way to Ikpek and, ah, 'cause someplace not many berries but always go further. Look for more berries. My [Native] allotment is at Apquagaagzruk, right here right on this side and right up here someplace other one. I chose that area 'cause it got more berries sometimes.... That place, I find it myself.

—Davey Ningeulook, Shishmaref, 1997

tightly that he couldn't maneuver, then killed him. When Ilaganiq's mother heard of her son's death, she became enraged. She took her mitten and reshaped the cape, making the shoals so shallow that hunters from other areas would no longer be successful there.

Conclusion

Toponyms are functionally and artistically imbedded in Kigiqtaamiut life and worldview. Just as the land itself has shape and presence, these place-names, tales, and histories provide both cultural contour and context to what cultural geographer E. Estyn Evans would call "the occupied earth" and what folklorist Alan Dundes would surely see as the texts and texture of a people and their place. Family texts, descriptive-geographic names, activity names, creation texts,

Susan Fair's work with Edgar Ningeelook on Shishmaref-area toponyms was first funded by the National Park Service, Department of Cultural Resources, Alaska Regional Office, Shared Beringian Heritage Program, with support and assistance from the Shishmaref I.R.A. Council. Tom Thornton of the University of Alaska Southeast is co-principal investigator on this project and will be doing comparative work with his Tlingit place-naming research in southeast Alaska. The NPS research formed the bedrock of this in-depth collaborative study funded by the National Science Foundation and supported by the Shishmaref Native Corporation.

memory toponyms—they all serve multiple purposes. What these names and texts share, however, is that they are created by, belong to, and define both persons and place. Toponyms cluster on the land. They draw attention to complex connections between themselves and features of the landscape as well as Inupiat residence and land-use patterns and local economies. They reflect language and dialect, social relationships, the transmission of information by gender, local beliefs, history, moral codes and other traditional knowledge, and, more recently, the interplay of traditional naming processes with modern land allocations. This essay gives the merest hint of such richness and is a beginning of research in these directions.

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The Life and Times of Paleoindians in Arctic Alaska

This report was prepared by Michael L. Kunz, Bureau of Land Management, Alaska; Daniel H. Mann, Institute of Arctic Biology, University of Alaska Fairbanks; Paul E. Mathews, Alaska Quaternary Center, University of Alaska Museum; and Pamela Groves, Institute of Arctic Biology, University of Alaska Fairbanks.

The responses of high-latitude ecosystems to global environmental changes are difficult to predict. If global climate models are correct, Arctic and sub-Arctic systems will be the first ones affected by greenhouse warming. The special sensitivity of high latitudes to climatic changes is not unique to the present and has probably been a feature of the Arctic throughout geological time. Consequently the Arctic has several important roles to play in global change research. First, it is an early warning site for what may be human-induced environmental change. Second, Arctic landscapes contain geological and biological records of the impacts of previous global changes. Third, the archaeological record provides insights into the effects of past climate change on human populations. By researching these records, we can provide key insights into the processes, thresholds, and possible effects of the climatic changes now threatening.

The Mesa archaeological site

The Mesa is an archaeological site of global significance located on the northern flank of the Brooks Range in the National Petroleum Reserve-Alaska (NPR-A). The site was occupied between 11,700 and 9,700 years before present (B.P.) and is the type locality for an Arctic representative of the most ancient, widespread cultural tradition in North America. Called the Paleoindian tradition, previously it had only been recorded at much lower North American latitudes. The Paleoindian story is an interesting one, especially the chapter recorded in Alaska.

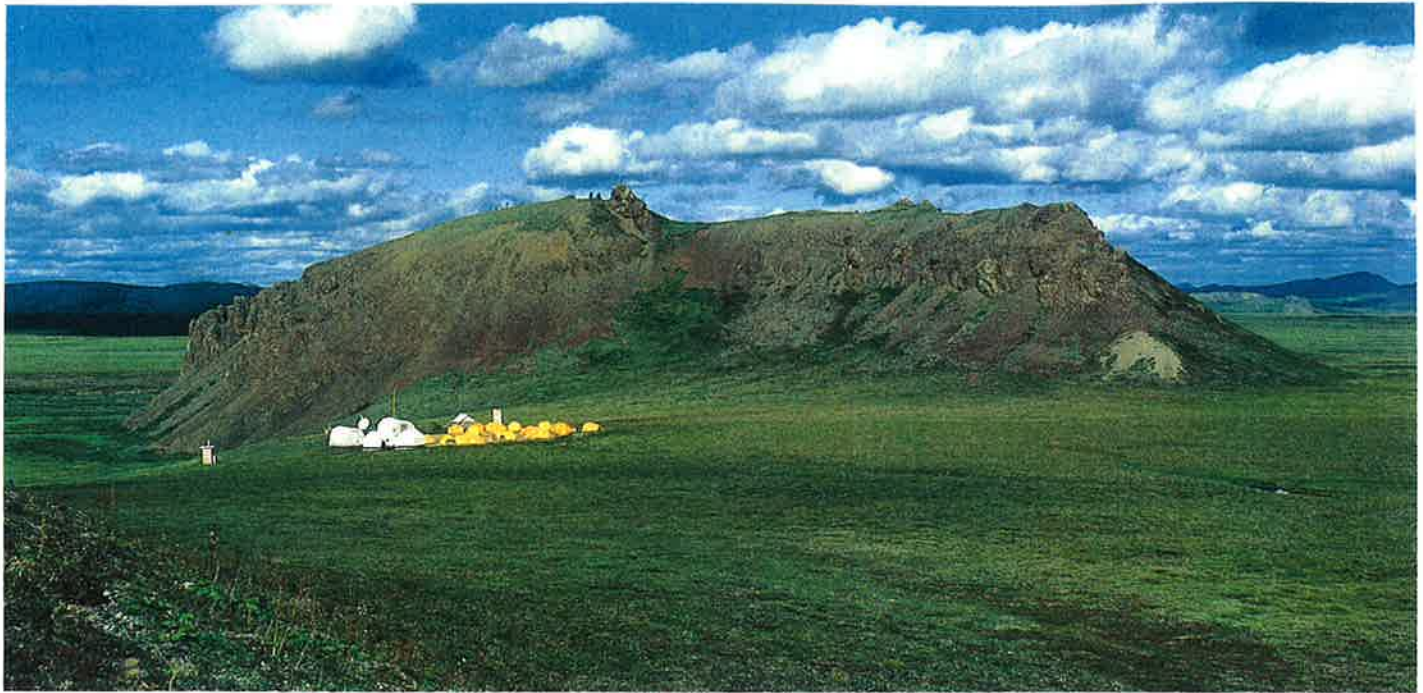
In 1926, at Folsom, New Mexico, the discovery of stone tools in direct association with the remains of extinct Ice Age bison established the antiquity of humans in the New World. The discovery of other sites of similar age and character across the North American High Plains and Southwest quickly followed, and by the 1950s archaeologists had noted a suite of commonalities among these sites. From these data archaeologists described a cultural continuum, the Paleoindian tradition, based on the technological and morphological similarity of stone tools, the composition of artifact assemblages, and association with extinct Ice Age animal remains (usually bison). The Paleoindian tradition comprised a number of cultural entities that spanned the transition period between the end of the Pleistocene and the beginning of the Holocene.



Since the 18th century, scholars have generally agreed that the Bering Strait region was the most likely locale of human entry into the New World. Therefore, archaeologists reasoned that the earliest evidence of human presence should be in Alaska.

In the decade following the Folsom discovery, several expeditions were sent to Alaska to search for Paleoindian materials older than those recovered from the heartland of temperate North America. Except for occasional surface or disturbed context finds of isolated "Paleoindian-like" artifacts, no true sites were found. However, archaeological sites containing artifact assemblages of apparent terminal Pleistocene age and almost identical in character and composition to those found in eastern Siberia were discovered. This situation led to the development of a model that explained relationships between two cultural entities appearing to be the earliest human occupants of the New World—entities that were contemporaneous but that were very different and occupied regions separated by thousands of kilometers.

The model was based on the presumption that New World human populations were the result of a single migration from Siberia to Alaska. Perhaps a few generations after their arrival in Alaska, the Siberian's descendants moved south along an ice-free corridor on the eastern slopes of the Rocky Mountains. This journey was thought to have



The Mesa site and camp.

taken many hundreds of years, and by the time the travelers arrived on the High Plains they had adapted to the new land and developed a different enough life style so that in the archaeological record they bore no resemblance to their Siberian ancestors: they were now Paleoindians. With few variations this remained the generally accepted model through the 1980s.

By the beginning of the 1990s, research at the Mesa had demonstrated the site to be a locale of Paleoindian occupation contemporaneous with Alaskan sites thought to represent the Paleoindian's Siberian ancestors. This situation demonstrated the need to re-examine the model for human entry, dispersion, and cultural evolution in the New World.

The presence of Paleoindians in the Arctic, thousands of kilometers north of their geographic homeland sparks a number of research questions. Why were these people in the Arctic and how numerous were they? How were these people making a living? Were environmental changes responsible for their brief residence in the far North? Indeed, were these people spreading north and west from the heartland of North America in association with a retreating ecosystem? Were they a remnant group left in the Arctic since the initial migration from Asia into America? Or was it simply an unknowable quirk of fate that brought them to the Arctic only to vanish there?

By 1993 our research at the Mesa had progressed to the point where we realized that to answer these questions we had to learn more about

the landscape and ecosystems that the Arctic Paleoindians occupied. The archaeology of the Mesa became the departure point for a broad enquiry into the history of an Arctic landscape during the transition between the last Ice Age and the present interglacial period. This particular climatic transition, occurring 14,000 to 8,000 years B.P., caused radical environmental changes on a global scale. Today, geologic and organic deposits from this period, including archaeological remains, provide a natural laboratory for studying how Arctic ecosystems, including those utilized by humans, respond to climate changes.

The Mesa served as a hunting lookout, and the activities that took place there between 11,700 and 9,700 years B.P. were directly related to hunting and the production and maintenance of the hunting tool kit. The site has produced a wealth of information regarding stone tool technology, hunting implements, insights into hunting strategies, and most importantly, new evidence for the cultural complexity that existed at the gateway to the New World at the end of the Pleistocene. However, the Mesa's archaeological record contains little information regarding the common everyday activities of its occupants. To obtain a complete picture of how these ancient Alaskans lived, we require information regarding the regional ecosystem during the Pleistocene/Holocene transition. Furthermore, given the lack of direct archaeological data, this information has to be obtained from non-archaeological contexts.

Changes in the Mesa region landscape

Ecosystems are tangled webs of interaction between biota and physical factors such as climate and geology. The impacts of global changes on individual species are determined in complex ways through the interactions of weather, plant growth, and herbivore and predator populations occurring within ecosystems. Our aim is to reconstruct how the global changes in climate and sea level that occurred ca. 12,000 to 8,000 years B.P. affected Arctic ecosystems north of the Brooks Range. The ecosystem components we are investigating include humans, vegetation, large mammals, fluvial systems, and permafrost.

Currently stream valleys are the sites of highest productivity in the region. The most active parts of the floodplains are bare sand and gravel, while areas left undisturbed by fresh sedimentation from the river for more than 1000 years pass into poorly drained tussock tundra underlain by thin active layers. However, between the bare gravel bars and the tundra lies a mosaic of vegetation including minerotrophic wetlands as well as willow and herb-dominated communities. Floodplain area and age, and hence vegetation composition and productivity, are controlled partly by the dynamics of the stream.

At the close of the last glaciation, valleys draining north out of the Brooks Range were clogged with sand and gravel carried by braided streams from retreating glaciers. Valleys aggraded to high levels, leaving extensive outwash terraces that now extend many kilometers north of the range front. By 12,500 years B.P., streams had downcut through this outwash fill and were at or below their modern levels. Then widespread aggradation began, lasting until approximately 11,000 years B.P. This Late Glacial valley fill is finer-grained than the glacial outwash sediments and contains abundant sticks and logs of willow and in some cases poplar.

In the Ikpikpuk valley at Little Supreme Bluff, detailed examination of bed and channel forms suggests that the river had a predominately meandering planform during this interval of valley filling. During the interval 12,500–11,000 years B.P., floodplains in the area probably were broader, were more frequently disturbed, and supported greater expanses of productive willow and herbaceous communities than today. As a result the variety, density, and population size of large herbivore species were probably greater than at any time since then. Although we are unsure what caused Late

Glacial valley aggradation, a likely candidate is increased precipitation following postglacial warming upon the initial flooding of the Bering Land Bridge.

Solifluction is the downslope movement of water-saturated sediments that typically slip over an impermeable layer formed at the top of frozen soil. In Arctic and alpine regions, solifluction is a potent mechanism of mass movement, transporting tons of material down hillslopes at rates of centimeters to meters per year. There is wide agreement that increased solifluction reflects deterioration in climate. However, the influence of climate on rates of solifluction clearly varies between climatic zones. By analogy to the less-maritime parts of Spitsbergen, solifluction increases when summers are cooler. This results in more water remaining in the active layer during freeze-back and causes more ice segregation. Thawing during the next spring is then associated with high water content in the active layer and more solifluction.

In the NPR–A, small tributary streams cutting through silty deposits at the base of hillslopes reveal an episode of solifluction that overrode peat sediments during Late Glacial times after 11,000 years B.P. Platey silt with oriented clasts represent the solifluction deposit. Such deposits often overlie a peat bed that is deformed and partly eroded. Interestingly the blocky, shattered nature of the underlying peat beds indicates they were deformed while in a frozen condition. This suggests an episode of solifluction caused by a period of colder climate. This type of erosive event is hard to date. However, these sections are consistent with an episode of solifluction occurring between 11,000 and 9,700 years B.P. and may well represent climatic shifts during the Younger Dryas event (a chaotic period of return to full glacial climate that occurred between 11,000 and 10,000 years B.P.).

Mammals and paleosubsistence

Procurement of subsistence resources is the primary activity of any primitive group, especially in the Arctic, where resource variety and exploitation options are so severely limited. How did the late Pleistocene/early Holocene changes in landscape ecology affect the availability of game animals, and what animals were the Mesa people hunting? The model we developed to describe the region's ecosystem changes enabled us to hypothesize some probable effects on large mammals. We wanted to see if changes in the types or amount of

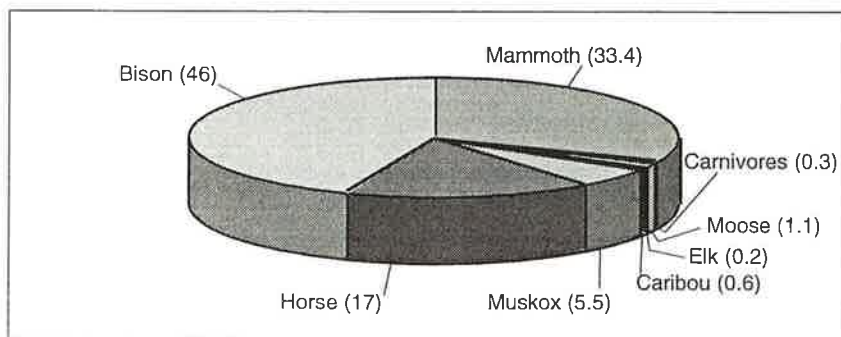
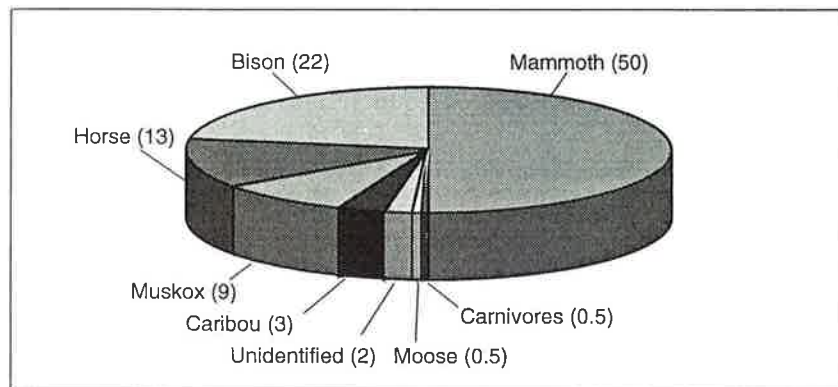


Pleistocene-age bones collected along the Ikpikpuk River.

game available could be correlated to changes in the record of human occupancy at the Mesa or to changes in hunting technology and methods. To address these questions we conducted a paleontological survey of the upper Ikpikpuk River, with the aim of providing information about what large subsistence mammal resources were available to human hunters after 15,000 years B.P.

Comparison of biomass percentages of late Pleistocene megafauna assemblages of North Slope (top) and Interior (bottom) Alaska.

We spent three weeks surveying the beaches, cutbanks, point bars, islands, and bluffs of the uppermost 75 miles of the Ikpikpuk River. We collected and cataloged 1300 large-mammal bones,

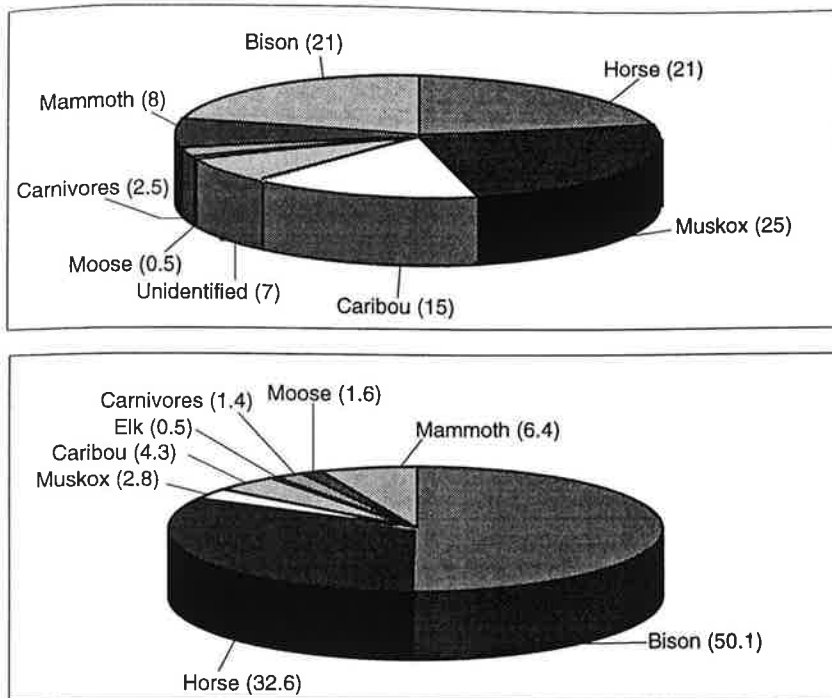


of which 10% appear to be from modern caribou. Over 95% of the bones were found on the beaches and showed signs of transport by the river. However, most of the damage on the bones was not characteristic of that seen on bones transported by river ice, so we believe that, in most cases, the bones had not traveled more than a mile or two from their original location. River transport does result in disproportionate preservation and must be accounted for. The most resilient bones such as podials, metapodials, phalanges, and teeth are far more common than other bones. Although most are broken or incomplete, approximately 70% of the bones are identifiable to species.

Although it is often unfruitful to collect loose bones at paleontological sites, the sheer number of bones present on the Ikpikpuk River beaches allows us to examine some issues that are rarely approachable in paleobiology. For instance, we can examine the relative abundance of various species and use radiocarbon dating to track these changes over time in order to estimate how relative population levels have changed and what climatic and environmental events may have driven these changes. With these data we should be able to tease apart the most important and interesting details about how and why mammalian faunas changed so dramatically on the North Slope in the recent past.

What has become apparent from our preliminary work are the differences between late Pleistocene faunal assemblages of the North Slope and those of Interior Alaska, which previously were thought to be quite similar. For example, mammoths constituted about half of the large-animal biomass on the North Slope, whereas in the Interior that value was closer to one third. While interesting, this may have little relevance regarding human subsistence, since there is no archaeological evidence of mammoth hunting anywhere in Alaska. Also, the large biomass percentage of mammoth is the result of body size and represents standing biomass not productivity. The smaller herbivores have proportionately less standing biomass but often produce relatively more new biomass annually. The implication for food web dynamics is that smaller mammals may represent less of the standing biomass but most of the productivity. In the case of the North Slope, bison, horses, muskox, and possibly caribou would have been responsible for most of the annual secondary productivity and therefore comprise the bulk of the potential subsistence resources.

If mammoths are removed from the equation, the large-herbivore community in Interior Alaska



Comparison of composition (percentage of individuals) of North Slope (top) and Interior (bottom) late Pleistocene megafauna assemblages.

was dominated by bison during the late Pleistocene, especially relative to horses and muskox. On the North Slope, however, the non-mammoth biomass was more equally divided between bison, horses, and muskox. Caribou also were much more common on the North Slope than in the Interior. (However, more caribou fossils must be dated before we will know if they were present throughout the late Pleistocene or only became numerous following the Pleistocene/Holocene transition.)

These variations in late Pleistocene faunal assemblages of Alaska's North Slope and Interior indicate definite differences in ecosystem dynamics. R. Dale Guthrie has produced the most substantiated model of the relationship between large-mammal ecology and ecosystem function in Pleistocene Beringia. Citing the greater productivity and digestibility of graminoids over typical tundra plants, he argued that the greater mammalian diversity of Pleistocene Beringia was a product of grassland biomes that dominated Beringian ecosystems, and indeed Beringia's fauna was dominated by grazers.

Guthrie also has shown that diversity among the grazing guild provides insight into ecosystems process. Specifically Guthrie's research has demonstrated that there were basically two types of large mammalian grazers inhabiting Beringian grasslands—ruminants and monogastrics—and that these grazer types had different foraging strategies that relate to their digestive anatomy.

Ruminants, such as bison, muskox, caribou, and moose, have evolved to thrive on relatively monotonous diets of moderate-quality, low-fiber plant material. The slow transit time of a ruminant's gastrointestinal system allows it to extract and absorb the maximum amount of energy and nutrition from a given forage. However, ruminants require seasonal spikes in forage quality (green-up season) in order to gain enough energy and protein to reproduce successfully. If the forage quality is poor, because of the slow gut transit time, a starving animal cannot eat enough food to keep up with its metabolic needs and can literally starve with a full stomach.

Monogastrics, or hind gut digesters such as horses and mammoths, differ from ruminants in foraging and digestive strategies. Monogastrics have evolved to make the most of low-quality, high-fiber forage through a combination of rapid gut transit time and a selective fermentation chamber called the caecum. However, because forage passes so quickly through a monogastric, protein and micronutrients often are not efficiently extracted. Therefore, monogastrics must have a diverse diet, which often includes plants that are more nutritionally packed but also more toxic (the plant's defense against being eaten). For these reasons biologists believe that monogastrics have evolved relatively conservative life history strategies in the form of reduced fecundity, increased development time for young, increased parental investment in young, and longer life spans.

Our preliminary conclusions indicate that the differences between large-mammal communities of the North Slope and Interior Alaska during the late Pleistocene are the result of differences in forage (grasses, sedges, herbs) quality, which affected the ratio of herbivores adapted to low-quality versus high-quality forage. Specifically it appears that higher-quality rangeland in the Interior favored bison, whereas monogastrics were more competitive on the poorer-quality rangelands of the North Slope. How these differences may have affected human subsistence strategies has not yet been determined, although the radiocarbon dating of more fossil remains may shed much light on this relationship. However, there is no doubt that mammal species dependent on steppe and/or dry tundra ecosystems dominate the fossil assemblage of the Ikpikpuk River drainage, a case similar to Interior Alaska.

Muskox are one of the few large Pleistocene herbivores still extant today in the region. Muskox are well documented from the early to late Pleis-

tocene of Europe and the mid- to late Pleistocene of Alaska. However, they have never been shown to occur in large numbers, and the common wisdom is that they never comprised a large proportion of Pleistocene communities. The large number of muskox bones recovered from the Ikpikpuk Valley demonstrates for the first time that muskox were an important component of the North Slope's late Pleistocene/early Holocene mammal community and possibly an important subsistence resource.

Finally, from a scientific standpoint the sheer number of fossils recovered from the Ikpikpuk River makes it a world-class paleontological resource—a resource that will produce interesting information for years to come.

DNA from frozen fauna

The permafrost of the North Slope comprises a vast freezer containing a genetic archive of enormous potential value. Bones from Alaska's North Slope are a particularly good source of ancient DNA. Bone tends to preserve the quality of DNA better than mummified or preserved soft tissue. The cold, dry environment of the Arctic also contributes to the preservation of DNA.

Besides telling us about ancient ecosystems on the North Slope, the bones of large herbivores recovered from the Ikpikpuk valley also contain a wealth of information encoded at the molecular level. Contained in DNA within these bones are clues about how Arctic mammals were affected by Ice Age climate changes. Radical and rapid shifts in Arctic climate during the last Ice Age may have imposed a series of population bottlenecks on some species. How did these bottlenecks affect the subsequent genetic diversity of mammal species? This information has obvious application to questions of conservation biology facing us today. DNA is also useful for identifying bones to species, for establishing the relationship between ancient species and their modern descendants, and for calculating the mutation rate of different species.

We are in the initial stages of extracting, amplifying, and analyzing mitochondrial DNA (mtDNA) from bones collected from the Ikpikpuk River. Because the amount of DNA in ancient bones is much less than in modern tissues, the extraction of DNA from ancient bones requires extreme care to assure there is no contamination with modern DNA. The degradation of DNA that occurs over time tends to break the DNA into progressively shorter segments. Therefore, small fragments, 200–300 base pairs in length, are targeted for amplification. Frequently it

is possible to amplify overlapping fragments of DNA so that longer segments can be created.

We are using a series of primers developed to sequence the cytochrome *b* gene of mtDNA in modern muskox and other closely related species. Because muskox managed to survive the dramatic climate and ecosystem changes at the end of the Pleistocene and persist in the Arctic up to the present, they are an extremely interesting species. Modern muskox have low levels of genetic diversity compared to other mammalian species. This dearth of genetic diversity may be the result of a series of genetic bottlenecks that the species has survived over time. These bottlenecks and population declines were probably driven by climatic fluctuations, which in the harsh Arctic environment would not need to be large to affect the survival of a non-hibernating, non-migratory species. The most recent bottleneck occurred at the end of the 19th century, when muskox numbers dropped so low that the species was thought to be in danger of extinction. Indeed, during that time, muskox disappeared completely from Alaska. They were subsequently reintroduced and successfully re-established. Elsewhere in their range, muskox have recovered from the low numbers, and the species is currently thriving. Thus the lack of genetic variability does not appear to be detrimental to the species, but it might influence the species' ability to survive future climatic changes. The comparison of ancient muskox DNA sequences with those of modern muskox will provide insight into the evolutionary history of this species. Specifically it will tell us when low levels of genetic variability first developed and what the mutation rate has been over the last thousands of years. By analyzing muskox DNA over the transition between the Pleistocene to the Holocene, it will be possible to evaluate the influence of that period of dramatic climatic change on levels of genetic variability within this species.

Preliminary analysis of 250 base pairs of cytochrome *b* sequence from six ancient muskox bones reveals very little variability between individuals and only 2–3% difference from modern muskox. These results, while preliminary, suggest that even by the end of the Pleistocene muskox may have lacked substantial genetic variability.

If confirmed by the 20 Pleistocene muskox bones left to be analyzed, these results would negate our initial hypothesis about progressive genetic impoverishment caused by climate-induced bottlenecks in population size. On the other hand, it might suggest that muskox have survived millions

of years despite frequent population crashes and very low genetic diversity, which would provide an interesting new perspective on policies for mammal conservation, where genetic diversity has become a major concern for wildlife managers.

Conclusion

Interdisciplinary research at the Mesa site on Alaska's North Slope has produced a diversity of data that provide a rare opportunity to not only examine the history of some of the earliest human inhabitants of the New World but also to tie that history into an ecological, climatological, and biogeographical context. Over ten field seasons of research at the Mesa have established the presence of a classic Paleoindian culture in the far North. These results have caused archaeologists to reconsider fundamental paradigms in New World prehistory because they suggest that Paleoindians and the people considered by many researchers to be their progenitors may have been contemporaneous in Alaska.

Our research has also produced data on the fluvial history and paleoecology around the Mesa, showing that the period 12,500–8,000 years B.P. was a time of complex climatological and environmental changes from Late Glacial steppe-like, dry tundra to wet tundra ecosystems. Radiocarbon dating of buried peats and other organics not only documents the beginning of tussock (wet) tundra development but also shows that, at the close of the Late Glacial period, aggrading streams draining north out of the Brooks Range filled valleys with glacial debris and formed extensive outwash terraces. By 12,500 years B.P., streams had downcut to at or below modern levels, and at around 11,000 years B.P., valleys began to be filled again by aggrading streams.

The large-mammal species available for Mesa people to hunt probably changed dramatically during the ecological reorganization that occurred at the Pleistocene/Holocene boundary. Over 1300 large-mammal fossils were collected from the Ikpikpuk River, demonstrating that bison, muskox, and caribou were the animals most likely hunted by the Mesa people. Radiocarbon dating of these fossils is ongoing to determine whether mammoths and horses also could have been hunted, when bison, mammoths, and horses became locally extinct, and when caribou started to dominate the large-mammal fauna.

In addition, we have successfully amplified and sequenced mtDNA (cytochrome *b*) from fossil

muskox bones; additional sequencing is underway for other mammals. These data suggest that late Pleistocene muskox had very low genetic variability and were only slightly genetically divergent from modern muskox.

By combining the information obtained from archaeological, geological, paleontological, and DNA investigations, we are recreating a comprehensive picture of an Arctic landscape occupied by Paleoindians during the transition between the last Ice Age and the Holocene. This work provides an understanding of the ecosystems exploited by these ancient people and the human responses to changes that occurred during this time of environmental transition. This broad-based perspective on how the Arctic ecosystem altered in response to the climate changes at the end of the Pleistocene is useful in predicting the impacts of greenhouse warming on the present Arctic ecosystem.

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What's in a Name?

Indigenous Place Names in Southeast Alaska

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In 1898 Kadashan, a Tlingit leader from the Southeast Alaskan village of Wrangell, made the following statement to Territorial Governor John Brady concerning his people's land rights: "Ever since I have been a boy I have heard the names of different points, bays, islands, mountains, places where [Tlingit] get herring, [go] hunting and make camps, that is why I think this country belongs to us." Kadashan's emphasis on his knowledge and hearing of place names in this context is intriguing and represents an important pragmatic function of toponyms among the Natives of Southeast Alaska. For these groups, the remembrance and strategic deployment of place names have always been important elements in the coordination, maintenance, and defense of Native activities on the land. As such, their documentation, reiteration, and interpretation is not just an intellectual issue but also a sociopolitical one, which both enriches and complicates the research process and necessitates a community partnership approach.

In this essay I seek to shed light on some intellectual and sociopolitical issues related to the documentation of place names and their cultural associations, based on my experience as a collaborative researcher in a multi-stage National Park Service-funded project with a regional Native organization and 10 Tlingit and Haida communities in Southeast Alaska over the past four years. A century after Kadashan, our research suggests that there is still much truth in his statement and in his implicit conception of the role of place names in Tlingit society. Moreover, comparable investigations among other indigenous Arctic communities with close ties to their traditional land bases reveal that similar conceptions of land and the cultural value of place names also endure in those societies, even though their land and resource tenure systems vary significantly and are typically more flexible than those found in Southeast Alaska.

Background

In 1994 I approached the Southeast Native Subsistence Commission (SENSC) about initiating a place names project in Southeast Alaska. My mo-

tivation for doing this was to expand research I and others had been conducting from the individual and community levels to the regional level of Southeast Alaska, a distinct ecological and cultural area within the state. The SENSC was a regional organization but not one especially well suited to research. Organized in 1989 under the auspices of the Alaska Native Brotherhood and sanctioned by the Central Council of Tlingit and Haida Tribes of Alaska and the Sealaska Corporation (the regional Native corporation), SENSC had been primarily an advocacy organization. Its principal mission was to protect, maintain, and enhance subsistence lifeways (particularly hunting, fishing, and gathering activities) in the face of growing encroachment from an expanding non-Native population, an increasingly hostile state legislature, and an often unresponsive regulatory structure. Alaska is unique among the states in having a subsistence policy designed to protect the wild resource harvest needs of rural Alaskans—a policy that flows from the Alaska Native Claims Settlement Act of 1971 but has been beset by controversy, fragile compromises, and cultural conflicts in its implementation over the past two decades.

The SENSC's usual workload involves dealing with legislative and regulatory initiatives affecting their ability to harvest, process, and distribute fish and game in customary and traditional ways. They had never conducted basic scientific research and never displayed a particular interest in place naming. So I was a bit nervous about making a proposal to do so. But I argued that, from my research among Alaska Natives, a key aspect of subsistence was the maintenance of traditional ties to *specific* landscapes, the wellsprings of their being. Not only did subsistence laws and regulations fail to take into account ties to place, but often they trampled upon them. What better way to emphasize the role of place in subsistence than to document place names, names that not only mark subsistence sites, but as rich linguistic artifacts and potent symbols, communicate a wealth of environmental and cultural information about Native interests in these places.

The vote was unanimous in favor of proceed-

This paper was first presented at the 1998 American Anthropological Society Annual Meeting. The National Park Service provided the bulk of the funding for this study.

ing. Indeed, many of the commissioners spoke in Kadashan-like terms in support of the proposal, noting how place names convey a sense of ownership, occupancy, and use of the land, and also a sense of stewardship and belonging to the land. SENSC President Martin reflected solemnly on how, as a middle-aged person, he had seen Native place names and Tlingit language pass from common use to virtual obscurity within his lifetime, and how it was important to document the names before they disappear altogether. So far so good.

There was one caution, however. In doing the work, we must have to be careful to respect each community's (or tribe's) wishes with respect to protocol. Even more, we must respect the authority of the matrilineal clans, the basic units of the social structure, which, despite centuries of exposure to a Euro-American patrilineal emphasis on identity and property inheritance, and more than a half a century of Federal efforts to tribalize Southeast Natives at the village level (typically a village contains a half-dozen or more clans), remain the key sociopolitical groups in Tlingit and Haida society. As it turns out, this was a prescient comment.

Collaborative research issues

At first, the concern about the primacy of the clans struck me as minor. As long as we constructed our research plan in conjunction with communities, each clan could speak about its own

names on its own territories and yield to other clans for other territories. I was more worried about conventional research issues, such as the artifice and limitations of working with tape recorders, maps, and charts instead of in situ and in vivo (the latter being largely impossible with our limited budget), and about training our local researchers to correctly record names on maps and interviews on tapes, so that the data would be usable for future researchers. My issues were not trivial, but in the end the SENSC commissioners were right to stress the sociopolitical issue as paramount. Here's why.

Speaking about names is an inherently political act (or Kadashan's Law)

There is an important "ethnography of speaking" distinction that concerns the articulation of place names. It is one thing to use a Native place name to refer to a site; it is quite another to speak *about* places or to speak *with* names in an authoritative cultural way. To speak publicly about a place name is to posit a relationship between oneself and the place. In traditional Southeast Native protocol, this is not done solely on the basis of experience—there is an organic-genealogical element to it that is even more foundational. This organic-genealogical element may best be highlighted by the question: "Do you belong to that place?" If the answer is no, then you cannot legitimately place yourself as an authority on the name, and it is considered disrespectful and potentially dangerous for you to

Tlingits Joe Hotch (left), Harold Martin, and other elders from Haines and Klukwon examining SENSC Native place name maps, May 1998.



speak about it, for words can injure and names are among the most powerful of words. If the answer is yes, then it is incumbent upon you to trace your sociological connection to the place before speaking about it in a cultural way.

From a Native standpoint, sociological and intellectual history are completely intertwined, and thus you cite your sources of ethnogeographic data by tracing your social ties to the place. In effect, genealogical footnoting among Southeast Alaska Natives is akin to academic footnoting in our culture; it verifies and legitimates the information and, in some cases, if the elder sources are alive or were recorded, allows it to be checked. In Tlingit thought, to speak *about* names beyond geographical referencing is to treat them as *at.óow* (literally, “owned things”), or intellectual property of the clan. Traditionally only clan leaders or their designees were entitled to interpret the toponyms, which typically involves telling the story behind the name, the story also being considered *at.óow*. This responsibility is never taken lightly because the *at.óow* are nothing less than manifestations of the clan itself.

*Collecting and writing down names
is a deracinating and potentially
dangerous act*

Place names are rooted in a cultural context. To write them down, or (worse) put them into a “database,” is to de-anchor them from the physical and cultural moorings that animate them. The dangers are many, and as researchers we heard about them when we introduced the project in various communities. For one, it seemed that there were “purists” in every community who worried about mispronunciation. After all, USGS maps are littered with abominable bastardizations of Tlingit words—like Sitka (*Sheet’ká*, “On the Pacific Side of Shee [Baranof Island]”) and Ketchikan (*Kichxháan*, “Near the Eagle’s Wing”) to name just two familiar ones—and few wanted to exacerbate this problem. In some cases the “genetic fallacy” was expressed: “Whites cannot pronounce our Tlingit words.” In others, it was provincialism: “Those northern Tlingits don’t know how we speak down here; it’s different... and they’re always trying to change it.” And at other times, the writing system itself was blamed. Statements like, “It’s kind of hard to use the English letters to represent Tlingit sounds,” were typical. Underlying these apprehensions was a basic fear: mispronunciation or misinterpretation of a place name through the alienating

effects of the written word might bring permanent disrespect upon a site and, by association, a social group. The recent and controversial bestowal of the Tlingit name *Dzantik’i Héeni*, “Flounders at the Base of the Creek” (a name for Gold Creek that came to stand for Juneau) on the new Juneau Middle School offers a poignant reminder of this: early on, the name was ridiculed as “hard to pronounce” and demeaningly rendered by some comedic students as “Santa’s Bikini.”

There is also politics in writing, especially where popular orthographies are only recent inventions, as is the case here. Elders who never learned the spelling system often distrust it, preferring the spoken word or their own idiosyncratic phonetic renderings. And then there is the matter of *who* developed the writing system. Angoon, for example, was quite loyal to the two bible translators who promulgated the first popular Tlingit writing system while living in Angoon in the 1960s, women who 30 years later are still referred to in the community as “those English girls who could really speak Tlingit.” Thus, Angoon insisted we use “their system” to record the Angoon Tlingit place names, despite the fact that it had been modified by others in subsequent years and perhaps no one in Angoon could distinguish “the girls’” system from the present one. Was this another form of genealogical reckoning? In the end we accommodated this demand by crafting a concise historical statement on the evolution of the writing system to give Naish and Story (“those two girls,” who are now probably in their 60s) proper credit as founders of the popular writing system. In retrospect, this was a good solution for academic reasons as well as political ones, for such a statement is not readily available in the literature.

Beyond poor rendering, a greater concern that emerges when place names and their cultural associations become words on a map or page is distribution. There is often at least one person who challenges: “What are you going to do with these names? Are you going to sell them to someone? Write a book and make *lots* of money” (assuming their gazetteers will make best-sellers)? The ethics and politics of mapping and writing about cultural landscapes have only recently begun to be explored. The problem is not just one of giving up secrets—a favored hunting or fishing spot or a prehistoric, artifact-laden grave or habitation site—but also one of process and control. Some view any identification of names in writing as a potential loss of cultural capital. For a culture with

a moribund language, place names may be viewed as a precious cultural commodity, an ethnic marker, especially for those who cannot speak their Native tongue. Perhaps for this reason, it was often the young monolingual leaders who favored the strictest controls on access to the Native names, as opposed to the bilingual elders. For Native-speaking elders, on the other hand, “speaking the names” was a means of demonstrating one’s emplaced status, and the fear of the names becoming alienated was seemingly outweighed by Kadasan’s principle that their release would reinforce territorial rights and underscore ancestral ties to landscapes. In this view, place names are essentially inalienable no matter how many times you “give them away,” and documenting them is a means of highlighting the region as Native land in both time and space.

Names are expressed in other media besides speech

This issue goes hand-in-hand with the concerns about the written word. But in the research context it arose from the fact that Natives were eager to show us the myriad ways that ties to place are represented. The ethnographic interview is, of course, not the traditional forum for speaking about names, and speech is only one medium through which place names historically were expressed.

Expressive “genres of place,” to use folklorist Mary Hufford’s phrase, include many aspects of material and symbolic culture. Take technology, for example. In Tlingit seal hunting watercraft, we find two unique responses to places that pose unique challenges to hunting: ice-filled bays. The Yakutat response was to develop a nimble little dugout canoe called the *gudiyé*, which could turn on a dime and maneuver amid icebergs with swift, quiet precision, allowing hunters to get close enough to harpoon the seals that dwell amid the ice floes. So well adapted were these canoes to Icy Bay in the Gulf of Alaska that their inventors reportedly kept them hidden in a secret lake called *Ligaas.aa*, “Tabooed Lake.” At Hoonah, in contrast, where Glacier Bay offers a larger but similar ice-filled refuge for seals, local Tlingits adopted larger camouflaged canoes to achieve their hunting objectives, as opposed to the small and nimble craft favored by the Yakutats. These Hoonah craft strove to simulate the icebergs themselves flowing amid Glacier Bay’s strong tidal currents. According to Hufford, such artifacts “comprise a distinctive response to distinctively regional conditions, a tool whereby local men distinguish themselves

as inhabitants of a singular region.” As such they become emblematic of the places that engender them.

Another important expressive medium for place is visual art. Among the Tlingit it is common for relationships to places to be referenced in ceremonial regalia and other clan *at.óow*. Totem poles show clan connections to bays and streams. Blankets and other regalia serve as historical texts, or storyboards, as well as deeds of trust in Tlingit law. Visual art was especially important in linking social groups to key landscapes in their history, including places from which their names were derived. Thus the Chookaneidí, named for a creek (*Chookanhéeni*, “Beach Grass Creek”) in Glacier Bay, celebrate this place. Even personal names and titles stemmed from places, a pattern quite the opposite of the Euro-American tradition of naming places for people.

Some names are best left unspoken or under-interpreted

If place names on the land are linguistic and cultural artifacts, representative of a rich archeology of knowledge, then it follows that their excavation requires special knowledge, care, and skill. These requirements apply to both the speaker and the listener. I have already discussed ethnography of speaking issues from the standpoint of who is qualified to speak about names; here I wish to emphasize “ethnography of listening” issues, particularly who is qualified to hear. As many scholars have stressed, place names have an enormous capacity to symbolize key elements of individual and group experience in compact ways. For this reason their deployment in social settings often assumes a certain shared experience, not simply with a particular geography, but with a particular history and set of cultural patterns.

A personal anecdote may serve to make this point. After I was adopted into the Kaagwaantaan clan a few years ago, a Tlingit friend of mine (from another clan of the opposite moiety) made a point of ribbing me about a place called *Gúx Shaanáx*, “Slaves Valley,” near a historic settlement site in northern Southeast Alaska. “It’s terrible how you guys [the Kaagwaantaan] behaved up there,” he said, “Your gang was brutal.” That’s all I got from him in that interaction. Not knowing the history of the place, I tried to press him a bit about it, but, not being Kaagwaantaan, he was reluctant to say more. “That’s your guys’ history,” he said, “We’re not supposed to speak about it.” So I followed up with some of my clan brothers,



Guwakaan Teiyi, "Deer Rock," one of the few Tlingit-named sites that is identified with a sign. It is located along the Chilkoot River near Haines.

but even some of them were reluctant to speak about it. "Things were different in those days [the days when slaves were owned and, on occasion, sacrificed as was reportedly the case in this valley]," I was told by one source, "it's not something we speak about very often." Was it that, in their minds, I just wasn't ready to hear it? Or was it just something that wasn't spoken about, except to mention the name itself? In retrospect, I think it was both: I wasn't ready to hear it *and* they weren't eager to tell it. Later, from closer relatives, I learned more of the story but always in dribs and drabs or indirect allusions that I am only now beginning to understand. It is in fact common for names to be unpacked in levels according to the listener's level of understanding and need to hear.

Similar "ethnography of listening" issues emerged around other names. In one community it was suggested that a place name that translates as "Place-where-a-woman-was-stabbed-in-her-privates" would best be left off our list. This was not so much because it was vulgar, but because it brought to the surface an incident that remains a source of tension between two clans. As it turns out, the creek also has a less gruesome and more neutral name: *Adawutlhéeni*, or "Battle Creek." This is the one that went on the map.

Sometimes vulgarity was the issue, though, and this proved to be a bit of a problem, given the Tlingit penchant for anatomical referencing in place names. Indeed it is a universal characteristic of place naming to incorporate the body, the pri-

mary environment we occupy, as a schema or metaphor for describing the larger environment we inhabit. In English we find this in such references as the "arm" of a lake or the "head" of a bay or the "mouth" of a stream. Southeast Native languages also have such references, and they extend to other orifices and appendages of the body too, which are not considered polite references by today's standards. Some of these, we were told, were "only nicknames" and not meant for general audiences and thus would have to be left off the final community maps.

Collaborative results

In this section, I want to examine some of the collaborative research solutions and results that emerged in the research in light of the methodological issues raised above. So far, with two phases of a three-phase project completed, SENSOC has documented more than 2500 indigenous names in 10 Tlingit communities. Each of these communities now has its own map along with a paper and electronic version of the computerized database that includes basic information about each site, such as the proper (given the local politics of orthography) spellings of the name, its translations (in some cases there are multiple interpretations), locations, sources, and associated information where available, such as ownership, use, geographic characteristics, and so forth. The maps are owned by the tribal governments in each

community; although SENS C retains a copy, it has agreed not to release or publish any mapped data without the consent of the local tribe.

Local autonomy and adaptation, in fact, became the cornerstone of our methodology. Every major facet of the research process, from the initial grant proposal to the setting up of the research organization, hiring of local research coordinators, gathering of data, reviewing of the draft maps, and acceptance of the final products, was carried out with the input and approval of the local tribal governments. While this process did alleviate or mitigate a number of the “control” and intellectual property issues, it did not automatically eliminate the fundamental collaborative research issues identified above. And new issues came to the fore when the final products were delivered. I will touch here just briefly on some of the more interesting and revealing developments.

Ethnography of speaking issues always remained near the surface. Some clan leaders preferred to talk about place names in a public setting and, in some cases, a ceremonial setting, as it was not customary to tell stories in private one-on-one interviews. Others preferred to give their interviews in private because they had alternative names or associations with names that they wanted known but did not wish to risk challenging the authority or veracity of the clan leader. This was true both within clans and between clans. Still others opted to have names within their clan territories recorded for the record in interviews or public meetings but would only speak about other places outside their kin territory (about which they might have considerable information from first-hand experiences and/or knowledge passed down from a father or other relative belonging to another clan) off the record or if formally invited to do so by the possessing clan. For example, on one occasion the oldest man in Angoon, who had fished, hunted, trapped, and worked in a cannery in a particular bay for more than a half century and had just spent the better part of lunch telling me about the place, said, when asked for a formal interview, that he “didn’t know too much about it.” Instead, he directed me to another source—a considerably younger woman, but more importantly an elder of the clan that traditionally possessed the bay under Tlingit law. Of course the old man could have given me volumes on it, but in the given situation he felt it was not proper to speak about it.

In addition to respect for clan prerogatives, gender and age issues came into play in these situations. While the above case involved an older man

deferring to a younger woman of another clan, the usual pattern within a clan was to have the women defer to the men and the “youngers” to the elders. Even though women often wield extensive power in matrilineal societies, it is typically the men who hold formal leadership positions and thus perform the authoritative roles in public. This is not to say that women would not speak but simply that they were always cognizant of their role in supporting the men. This led to some amusing situations, because in most villages the number of elderly women far exceeds that of men. In Hoonah, for instance, we encountered one clan with almost a dozen Tlingit-speaking women in their 70s and 80s but only a few male elders, who were considerably younger and, if not less knowledgeable, astonishingly more prone to forgetting. But the women kept propping them up! They all told us we needed to talk to the “menfolk,” and that men knew “all the names.” And when we came back to them after talking with the menfolk (who, by the way, often admitted that the older ladies remembered more) would still use phrases like, “I’m sure my [clan] brother must have told you about this place...” when it was clear from the questioning or the maps that it was *terra incognita*. In some cases it seemed that the women favored having a clan meeting to further discuss the place names, in part so that they could use the opportunity to educate the men.

Ethnography of listening issues also posed interesting dynamics, especially the “interviewer effect.” Does a clan member do better talking to another clan member as opposed to a non-clan member or a non-Native? Does a male do better talking to a male, or a female to a female, or an elder to an elder? From the preliminary results of our project it is hard to tell if any of these factors consistently made a difference. Intra-clan politics is often much more contentious than inter-clan relations, and the same could be said for age and gender. Similarly, local interviewers may actually get fewer interpretive details on places from experts than non-local researchers because the expectation is that they already know them. Overall, what seems to be most important is that the individual doing the “listening” have a legitimate and sincere reason for being there—not just a need to know but a willingness to learn. If this could be communicated, then the respondent would more easily assume the role of teacher to the interviewer/student. With a local hire policy, no interviewer is baggage-free, but generally interpersonal issues are dealt with openly, and tribal councils, which negotiate these minefields on a daily basis, were

extremely helpful in fostering the best interview dynamics.

Perhaps most interesting and surprising were the ways that questions of distribution of the results were handled. Here again we encountered a variety of responses. Some tribal governments were so eager to get the information to their people that they made bootleg copies of draft maps that we asked not be circulated until they had been reviewed and finalized. This, too, led to some amusing incidents, such as the time I went to interview an elder, a key figure whom we had missed in our initial fieldwork, about his knowledge of place names in the area. Halfway through the interview he announced that he already had a map like the one we were putting together, which he had obtained from his son in Anchorage. Anxiously wondering if we'd missed a source or been pre-empted, I asked, "Who produced the map?" He didn't know, but when he brought it out, I immediately recognized it, despite the handsome wood frame, as our draft map.

In another case, lack of distribution was the problem when a change in the composition of the tribal government led to a near refusal on the part of the local research coordinator to hand over the data. The problem was that her clan, the original inhabitants of the area and the providers of the bulk of the data, was no longer represented on the council. In the absence of representation, she feared the information would not be properly respected, credited, or utilized and thus was loathe to turn it over. This led to a rather tense delivery-of-the-final-product meeting, as the social drama was played out before our eyes. By the terms of our research plan, we were obliged to turn over the results of our work to the tribal government, but at the same time traditional Tlingit protocol necessitated that we not offend the local research coordinator or her clan by ignoring their concerns. SENSC President Martin successfully mediated the conflict by adopting a traditional method of arbitration in which he essentially played a peacemaker role (what the Tlingit call *guwakaan*, or "deer"), ensuring that both parties' concerns were respected and their interests honored in mutually agreeable ways. In the end a compromise was brokered whereby the local research coordinator, an elder acting primarily through her sons, agreed to turn over the data, and the council agreed to form a special committee, composed of *all* the local clans, to oversee the place name data. Without a culturally sensitive approach to this issue, however, it is easy to see how the conflict might have been exacerbated rather than resolved.

Revolutionary gains in computer technology offer potential means to ameliorate some of the limitations and alienating effects of the written word in disseminating knowledge. In Angoon, where the tribal government was strongly in favor of developing place name products to "teach our Native kids," we worked with the Alaska Rural System Initiative in education to develop a "talking map" prototype on CD-ROM. The computer-based platform allowed us to marry each name on the map to a sound file containing a local elder's voice correctly pronouncing the name. To this information, innumerable other links could be added, including other audio clips, video clips, still photography, and traditional text files that might reference visual art, songs, technology, and other genres through which Tlingits express their relationships to place. This pleased the council, and though (as we might suspect) there were politics about who spoke the names and had access to the CD-ROMs, the tribe saw this as a more suitable channel for broadcasting names than traditional paper maps. We are working with other communities to produce similar computer-based products.

Besides education, place name maps have been used to achieve other tribal interests. Among the most important of these is the defense of territory and resources. Hoonah tribe members have begun using their place name map as proof of their deep and organic connections to Glacier Bay, which has been largely shut off to them since it became a national park. In the following excerpt from a recent Hoonah tribal publication, the oldest of three Tlingit names that chart the geomorphological development of Glacier Bay is used to emphasize the antiquity of Hoonah's relationship to the bay.

Since the beginning of time, the Huna Tlingit used and occupied Ts'shee yei [*S'e Shuyee*] ("Drainage through the Clay"), now known as Glacier Bay National Park. This homeland is the source of both consumptive and non-consumptive customary and traditional uses. The consumptive uses have been utilized for both physical and spiritual nutriment. These customary and traditional uses are necessary for our cultural survival, or traditional lifeway, and any Federal actions which force a loss of the uses is an act of genocide.

The Auk and Sitka tribes have similarly deployed place names to have historic sites under threat of development re-evaluated as traditional cultural properties under the National Register of Historic Sites. The Tlingit village of Kake has expressed interest in adding some of its indigenous names to official cartographic sources such as

USGS maps and NOAA charts, an act of re-appropriation reminiscent of recent Canadian Inuit efforts in Nunavik (northern Quebec) and Nunavut (Northwest Territories). Meanwhile, a SENS Commissioner in another community showed a map (in large scale so as not to give away too many secrets) to illustrate how halibut banks were traditionally named and owned by Southeast Natives in a presentation to a group considering changes to halibut subsistence fishing regulations. And on another front, SENS has had to act against efforts by tourist enterprises to appropriate place name maps for sale on tour boats. These acts are all reminiscent of Kadishan's instrumental use of place names to protect his tribe's territory.

While discussion so far has dwelled mainly on how SENS collaboration with Native communities involved adapting our research program to meet local needs, there is also the other side of the coin. How can (or even should) place name studies be used to address scientific objectives? After evaluating the 2500 toponyms we collected in the first phases of the research, a number of interesting ethnohistorical and ethnoarchaeological questions have emerged concerning topics such as Southeast Native migrations and settlements, subsistence patterns, population densities, warfare patterns, and the like. What is more, there are basic questions of human cognition that flow from the data and beg comparisons from other groups, including other coastal peoples, such as the Inupiat of northern Alaska. Questions about the syntactic construction of place names, their semantic content, the universality of generic terms for perceptually salient biogeographic features, and the pragmatic deployment of toponyms are important cross-cultural issues.

As an anthropologist, I am interested in these questions, as are other humanists and scientists. But most Natives have to be sold on the value of such research, since the results may be seen as not directly benefiting them or as leading to unwarranted speculation or generalizations. Some Tlingits initially wondered why, for example, I would want to do a comparative structural and statistical analysis of Tlingit and Euro-American toponymies in Glacier Bay. But when I presented the results to them, many were impressed with the differences and patterns I had identified—particularly how the Tlingit names were more descriptive of the topography—and this led to fascinating intellectual discussions on the nature of Tlingit language and how place names evolve.

Similarly some Tlingits were not eager to see the Park Service employ the Glacier Bay place

name maps as a tool for archaeological research. There was a sense that sacred places could be disturbed and that there was no real need to dig up what they already knew was there or to date what they already knew to be very old. On the other hand, some wanted to see the areas documented, if nothing else, to bolster with science their historical and territorial claims in Glacier Bay. With these concerns in mind, and in close consultation with the tribe, the Park Service surveyed several named sites and dated material (though not the ethnicity of the occupants) from one identified fort site at approximately 6500 BP—a date that Tlingits could comfortably equate with “time immemorial.” These projects, too, were in a very basic sense collaborative and demonstrate the value and contributions of traditional knowledge and collaborative research methods to the realms of science.

Conclusion

Many of the issues I have raised in this essay are seldom discussed in ethnographic research, collaborative or otherwise. They are complex issues with no simple answers. Blanket programmatic statements on procedures and ethics for dealing with Alaska Native communities in research (such as that endorsed by the Alaska Federation of Natives) offer some guidance but do not address some of the most basic sociopolitical issues that researchers confront in communities. These lessons perhaps *are* best learned *in situ* and *in vivo*, by dealing directly with real and heterodox Native communities, each of which is unique, as opposed to idealized orthodox ones that are really only legend (at least in Southeast Alaska).

But it pays for us as collaborators to reflect on what it is we have learned in the process so others can avoid costly mistakes. Reconciling scientific and local interests can often be challenging and grueling, but in the end the dialog is usually constructive and worthwhile. Perhaps most importantly, collaboration helps each community to become more knowledgeable of and attuned to the other's interests. It also helps to forge new and shared research objectives for the future. In the case of “threatened resources” like place names at least, some objectives are easy to agree on. We all concur with Linnaeus's admonishment, for example, that “if you don't know the names, your knowledge of things perishes.” But the great taxonomist would have to do better than that to sell his place names project at a tribal council meeting in the 1990s.

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Traditional Knowledge and Radionuclides

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The Alaska Native Science Commission (ANSC) and the Institute of Social and Economic Research (ISER), University of Alaska Anchorage, recently received a three-year grant from the U.S. Environmental Protection Agency (EPA), Office of Radiation and Indoor Air for a Traditional Knowledge and Radionuclides Project to document Alaska Native understandings of environmental changes. The funding for this project is a dramatic effort on the part of EPA to respond directly to Alaska tribal concerns about contaminants in their subsistence foods by bridging Native and western ways of knowing. The goal of this project is for Alaskan tribes to identify, address, and document their concerns about radionuclides and other types of contamination in a database that will be a useful tool for tribes, agencies, and researchers. To achieve this goal we will seek to synthesize Native and science-based knowledge about environmental change.

The Alaska Native Science Commission was created to bring together research and science in partnership with Alaskan Native communities. In 1994 a series of workshops were held with Native community leaders and elders and Arctic scientists to discuss the formation and structure of the ANSC. The National Science Foundation provided funding to facilitate the growth of the ANSC, which in this project will be the primary link between the scientific community and the Alaskan Native community. The ANSC's 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 rights. The goals of the Commission are to:

- Facilitate the inclusion of local and traditional knowledge into research and science;
- Participate in and influence priorities of research;
- Seek the participation of Alaska Natives in all levels of science;
- Provide a mechanism for community feedback on results of scientific activities;
- Promote science to Alaska Native youth;
- Encourage Alaska Native people to enter scientific disciplines; and
- Ensure that Alaska Native people share in the

economic benefits derived from their intellectual property.

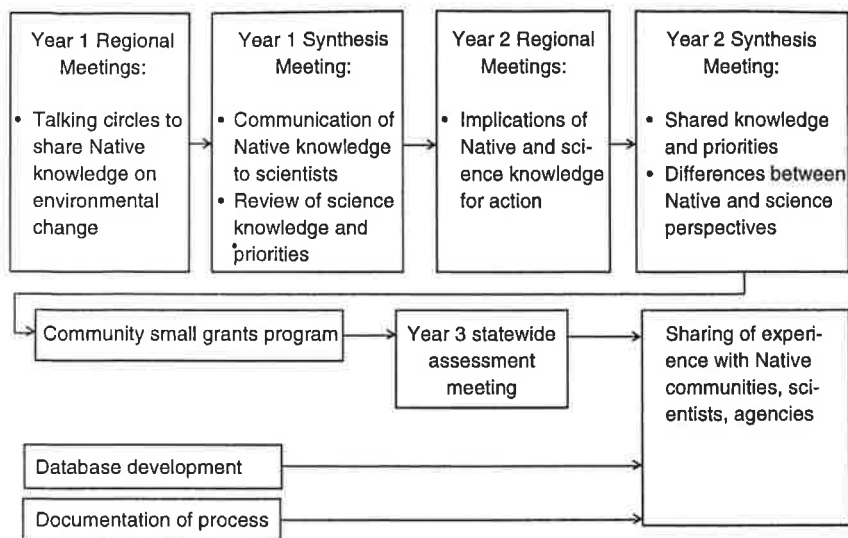
Alaska Native leaders have repeatedly sought to bring the concerns of Alaskan tribes about the safety of eating subsistence foods to public attention. North Slope Borough Mayor Benjamin Nageak, for example, wrote this to the U.S. Arctic Research Commission and the Alaska Native Science Commission in a letter dated August 29, 1997:

Through this letter I would also like to call your attention to a major concern of many Native people in the Arctic, and this pertains to environmental pollutants (lead, cadmium, PCB's, radioactive materials, etc.) and their actual or potential impacts to wildlife and the people who use the animals for food. This has been a problem and source of worry for our people for decades.

Both scientists and the Alaskan tribes are concerned about the safety of eating Native foods. Scientists are principally concerned about the uptake by animals and fish of persistent organic compounds, heavy metals, and radionuclides originating outside of the U.S. Arctic. They are also concerned about natural local sources of heavy metals and radionuclides. While the scientific community has begun to assess the state of knowledge about contaminants in Alaska, their assessment is not complete.

Even less is known about Alaska Native concerns regarding the safety of eating Native foods. What is known, however, suggests that Alaskan tribes are concerned about their observations of increased frequency of abnormalities in animals and fish. They are also concerned about local sources of environmental hazards, including military sites. The Alaska Native community has heard about potential seen and unseen contaminants in Native foods, and they naturally wonder if these contaminants may be the cause of observed changes in the body condition of harvested animals and fish and increased rates of cancer among their people.

In direct response to these concerns, the ANSC and ISER have begun the process of listening to and documenting Alaska Native observations about contaminants and environmental change.



Project approach.

The most important goal of the project is to increase community ownership and trust as a result of documenting and accessing traditional knowledge. To accomplish this goal the Traditional Knowledge and Radionuclides Project will use an in-depth, interactive process that will include meetings, education, training, outreach, documentation, and funding. For all phases of this project, community experts will be consulted to develop methods to preserve local control and promote local uses of the information collected.

This project's conceptual approach recognizes two streams of knowledge: Native knowledge based on generations of keen observation of environmental change, and science knowledge based on systematic observations and measurements over a shorter period of time. This project is based on the premise that without drawing on both streams of knowledge, an effective approach to managing the risks of contaminants in Native foods cannot be achieved. We recognize, however, that we confront different challenges with respect to documenting and synthesizing each type of knowledge.

Most Native knowledge resides in the minds of village residents and in the oral tradition and has not been written down or compiled. In the case of Native knowledge, our task is to identify Native experts and to ask them to share their knowledge. The compilation of scientific knowledge, on the other hand, can be described best by defining the gaps in that knowledge. Any attempt to fill in all these gaps with Alaska-based research would result in enormous research costs. Fortunately, however, this project is benefiting from seven years and over \$20 million in research and communication conducted under the auspices of the Canadian North-

ern Contaminants Program. While there are important differences between conditions in Alaska and various parts of the Canadian North, it is clear that a great deal can be learned from the Canadian work on the sources, transport, and uptake of contaminants. In the case of science knowledge, then, the task of this project is to bring together Alaskan research data and to interpret it in the context of the Canadian findings.

A critical step with respect to both Native and science-based knowledge is to seek a synthesis between these two knowledge systems in the development of a database that will be accessible to village residents, scientists, managers, and policymakers. Among the relevant factors are harvest and consumption levels, contaminant levels, nutritional benefits, effects of contaminants on animals and people, and cultural values. In the case of documenting Native knowledge, we are principally interested in recording the concerns of people who depend on Native foods and in the observations that form the basis for these concerns. In the case of science knowledge, we are looking at the measurements of contaminant levels in Native foods, and we intend to summarize what science has to say about the effects of these contaminant levels on wildlife and people. One of the goals of this project will be to make information regarding potential risks of eating Native foods more accessible to Alaskan tribes and Federal agencies.

Project approach

In contrast to typical scientific methods used for collecting traditional knowledge, such as surveys and public hearing testimony, the first year of this three-year project will be devoted to gathering traditional knowledge about environmental concerns across five regions of Alaska using locally meaningful practices and protocols. Meetings in each of the five regions will be organized with key community and regional experts. The purpose of these meetings will be to document local people's concerns and observations regarding environmental change.

Year two of the project will focus on organizing a second series of regional meetings to allow tribes and scientists to consider appropriate ways to synthesize traditional and local knowledge about environmental changes with information from the science community. These synthesis meetings will enable scientists and communities to identify common and divergent understandings of

environmental change, including the role of radionuclides and other contaminants. During these workshops, tribes will discuss what they think are the most appropriate actions to address concerning radionuclides and other environmental risks.

During year three a community grant program will be implemented to support Alaska tribal efforts to address their concerns about contamination. This grant program will support tribe-initiated projects such as community education, training, sampling equipment, laboratory testing, and analysis. A final workshop at the end of year three will be convened to bring together the grantees to discuss the outcomes of the action grants. During this workshop, Alaska tribes will evaluate the process they used and consider future initiatives.

All of these workshops will be videotaped, and participants' concerns and observations will be entered into a database. The project will create a record of the entire process of regional and synthesis meetings as well as the grant program. A final statewide assessment meeting will be convened and will focus on how to apply lessons learned from the Traditional Knowledge and Radionuclides Project to future initiatives.

Northwest Alaska Regional Meeting

Our first regional meeting was held in Nome September 30 – October 2, 1998. Native elders, subsistence users, scientists, and resource managers met from tribes around northwest Alaska to discuss concerns and to document and map environmental observations of change. The meeting was attended by elders and subsistence users from Elim, Golovin, Stebbins, Nome, Kotzebue, Shishmaref, Wales, Brevig Mission, Shaktoolik, Koyuk,

Savoonga, Gambell, Little Diomed Island, Aniak, and White Mountain.

Generally elders and subsistence users shared two kinds of information during the regional meeting: knowledge about the environment regarding the weather, ice, topography, climate, plants, animals, and inanimate things, and information describing human health concerns, such as cancer. These types of concerns were then linked to descriptions of subsistence activities such as berry picking near military dump sites. The general categories of concern raised during the three-day meeting were:

- Fish abnormalities;
- Increasing populations of beavers and bears;
- Changes in migration patterns of walrus, bearded seals, and caribou;
- Changes in weather, ice, and currents;
- Noise pollution;
- High cancer rates in humans;
- Russian sources of contaminants; and
- Contaminants in subsistence foods.

The workshops are facilitated in the manner of a talking circle, a traditional and holistic method of dialog within Native communities. Drawing on the basic talking circle format, a "leader" is designated to facilitate the group and an elder is selected to begin and end the talking circle with a prayer or meditation. After the opening prayer, elders and subsistence users participating in the talking circle introduce themselves to one another and have the opportunity to share their concerns and observations with the group. The circle follows a clockwise pattern, in respect for the cycle of life, and continues as long as necessary to give everyone who wants to share information an opportunity to do so.

As keen observers of the natural world and carriers of long-term orally transmitted knowledge, Alaska Native elders and subsistence users possess a wealth of knowledge about the environment that often goes untapped by natural science research methods. The regional workshops provide an opportunity for local experts to express their observation of environmental changes, as well elaborate on which observations are of greatest concern to them and their communities and why. Although we are not limiting our inquiry to these areas, this project focuses on environmental changes as they relate to the following topics:

- Health or populations of animals, plants, and fish;
- Health of people;
- Sea ice, currents, and weather; and
- Sources of radionuclides and other contaminants.

*Talking circle participants
in Sitka.*





Members of the Fairbanks talking circle sharing concerns about environmental change.

For each of these environmental changes, we are asking community experts to share their impressions on the following topics:

- How people have come to be concerned;
- How people explain these changes; and
- What people think should be done about the changes.

The community experts invited to the workshops will function primarily as interpreters of their own experience. Secondly they will summarize the experiences of other people they know in their community, especially community elders and active hunters. We are asking workshop participants to share their knowledge and impressions about the following topics:

- Why the health or numbers of animals, plants or fish may be declining;
- Why people's health may be declining;
- Why sea ice, currents, and weather are changing; and
- Why sources of contaminants may be increasing.

With its roots firmly in the past, traditional knowledge about the environment is both cumulative and dynamic. One of the challenges of documenting traditional knowledge is finding an appropriate method for fully translating the cultural context of the environmental observations. For example, when people spoke in the talking circle about their environmental observations and concerns, much of what they shared with the group was embedded in descriptions of subsistence activities, explanations of kinship connections, or comments about an increase in cancer and other health concerns. Another challenge we are working on with the community experts relates to the issue of intellectual property rights. For example, participants in the talking circle would like some information they shared to be restricted. Taking such requests into

account, the project database will accommodate intellectual property rights and confidentiality.

In their own words

These excerpts show how environmental observations are connected to many other concerns and comments; they also show the challenge of documenting these interconnected observations.

I've noticed that few people my age are still living. The seasons are getting very fast and are getting all mixed up. I was raised by my grandparents and I was out on the country with them during my school years. I helped my grandmother put things away. The last few years she was living she said that there was not enough time to put things away like there used to be. A few years ago I told my kids that we just have to work faster. When we are done with the willow leaves then comes the sourdocks. But these seasons are in too much of a hurry now. Now before we're done something else is ready. It is odd because it is not natural for these things to be growing at the time they are. Also, I've noticed that there are few plants that grow where they used to grow. We used to pick these plants by the lakes and we used to combine them with salmonberries. I don't notice too much of these plants anymore.

—Hannah Miller, Nome

I noticed that a long time ago when I was growing up the plant and berries used to be sweet in July. Nowadays the greens and even the berries don't last long. I go camping and I notice different things. I enjoy camping but four days ago my son-in-law killed three birds. Two of the birds were okay but the third one had pinkish water inside. This is bad and I was scared there was something bad in there so I threw it away. I've been camping since 1949 and I notice differences between then and nowadays. I start wondering why old people get Alzheimer's. I never used to see Alzheimer's. I have a mother who passed away this spring. I don't understand what is going on with our food. Something is happening but I don't know what. This morning I was walking here, I could smell the city pollution. When I'm at camp I can only smell nice clean air.

—Roseanna Dan-Waghiyi, Stebbins

I was born and raised in Savoonga. I've been the mayor of Savoonga for 44 years. There is another election in October and there are no other opponents. This past year there were no blackberries because they grew too late in the season and they were only hard and small. The health of our people seems to be pretty stable. A few people have cancer. We think it comes from the Northeast Cape,

which is the old village site. There have been a lot of changes in the sea ice currents and the weather. Solid ice has disappeared and there are no longer huge icebergs during fall and winter. The ice now comes later and goes out earlier and it is getting thinner. The current is stronger. We used to have a very low tide down at the beach and it is windier on the island. We had a bad hunting season with lots of high winds. Some years ago there was a massive amount of dead murrelets that floated on the water. I think they caught the warm currents from Japan. Our elders tell us that our earth is getting old and needs to be replaced by a new one.

—Jerry Wongitilin, Sr., Savoonga,
St. Lawrence Island.

My father is Jimmie Toolie. My Eskimo name is Pegitkaq. I take care of reindeer herds on the island. I'm the chief herder. I'm a hunter, a fisherman, and I love to go camping. I lived all my life on the island except when I had TB (tuberculosis) and I was in a sanitarium for five and a half years. People on the island are very concerned about the animals we eat now. They think there might be something wrong because they are getting very skinny. A couple of years ago there was a lot of dead birds all over the beach. I wonder why this is happening? The elders said that there never used to be cancer but now they are getting cancer. They think it may be from the Northeast Cape site. Jerry is my first cousin and I like to tease him a lot. He doesn't get mad except for one time he did when I poked him in the back.

—Herman Toolie, Savoonga,
St. Lawrence Island

I was born in Deering on the south side of Kotzebue but I was raised in Shishmaref. I worked for the federal government for 31 years and just retired this April. Even though I work for the government, I make sure I go hunting every spring for my family. I've seen a lot of studies on contaminants and animal behavior and the problem I see is that we never get feedback on why this behavior is happening and what contaminants are present in them until it is too late. In the meantime we are eating them and possibly being contaminated by something we don't know. We just have to guess at the sources of contamination because we don't know. My sister died a couple of months ago of cancer. I often wonder what caused it? Was it her Native food, the air she breathes, or the non-Native food she ate? It makes you wonder why cancer is getting more frequent, especially in our older people. I certainly hope we get some feedback on the results of these studies because everyone is getting concerned on why these things are happening. I hope we can learn something from each other at this meeting.

—Delano Barr, Shishmaref

I lived most of my life in western Alaska. I've been in groups like this in the past. The animals and berries are changing. I've noticed that the silver salmon had sore-like spots on their sides. They said a few years ago when the birds were dying that there was a yellow-like substance like foam in the bay. We've never seen anything like that before. When I talked to the elders at home before I came here they talked about the migration patterns of the walrus and caribou changing. Recently two families lost their reindeer to caribou because they came right down the beach near Koyuk. The caribou used to come 15–20 miles inland and now they are migrating towards our area. One family lost most of their herd this year. It seems that in my lifetime the migration of the walrus and beluga are really changing too. Take an example from the lemmings, when there are too many, they go to different areas to feed. That is the way it is with the walrus too. They are going to new places to feed. Last year thousands of them went to Norton Bay. When we opened their bellies, we found rocks in there. They migrated towards the land, maybe it was because they ran out of things to eat.

—William Takak, Shaktoolik

I'm from Koyuk, and I've lived there all my life. My Eskimo name means man from the sky. My father's name was Milton Adams. Beda Adams was his first wife. I have brothers in Anchorage from his second wife. I spend most of my time hunting. I hunt caribou and I like to hunt moose. Sometimes there are more moose and sometimes there are no moose at all. I used to pick berries when I was young. I noticed that I used to pick salmonberries in August and now they pick them in July and by August all the berries are gone. I used to hunt birds in mid-September but now they leave Koyuk Flats earlier. It seems like the birds are in a hurry to go outside.

—Alfred Adams, Koyuk

There are a lot of things happening. The weather has gotten warmer. The taste of the plants has changed. The fur is coming off the seals like they are molting but it is not molting time. We're wondering if Chernobyl was responsible. They were wondering about Russian military dumping toxic wastes and it is coming over to our side. I'm glad to be here and to understand that we aren't the only ones to experience these changes. We are isolated with one week mail service. It is really hard to get off and on our island.

—Eric Iyapana, Little Diomedea

The fish are not as abundant either, probably because there is too much machinery. My grandparents said that where we live now is too noisy. I wonder what the animals think about the noise?

Oh, those jets that fly over us should just stay home! We don't know what is going on with the fish and it is important to find out why they are disappearing. When this cancer all started, I wondered at night whether all this cancer was caused by something we are eating, breathing, or because we aren't cleaning up after ourselves? It would be wonderful if we could just get a glimpse of what is happening to our food. I'm going to ask a question that I don't understand. What is it about the beaver that will contaminate our drinking water but it doesn't bother the fish? We are told we can't drink the water because there are lots of beaver. But we've always drunk it. I don't understand.

—Hannah Miller, Nome

Project outcomes

One of the direct outcomes of this project will be a database that systematically documents Alaska tribes' perceptions about the nature and source

of contamination in each community. This database is unique because it is primarily concerned with providing first-hand concrete information about Alaska tribes' environmental concerns and observations. Another outcome of this project will be a network of Native experts who possess specialized environmental knowledge. This network will credit Native people's vast knowledge of their environment and will be used as a resource for tribes, agencies, and researchers who may be interested in contacting Native experts for further information on a particular resource or geographic area. One important aspect of the network of Native experts will be to determine the local community standard of "expertise." For example, during the Northwest Alaska regional meeting, participants came up with the following criteria for determining "expertise": who you learned the skill from, the length of time the expert has been an active bearer of that knowledge, language fluency, and geographic area.

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Back Cover

Harvey Pootoogooluk's 1978 "Man with a Burden," which recalls tales told by Makaiqtaq Barr and his son Gideon Kahlook Bar, Sr., about Cape Espenberg, in which the strongman Ilaganiq ruled the area. Shishmaref whalebone and walrus ivory carvings and etchings often narrate folktales and stories about place. During Ipiutak cultural times, large stones like this must have been brought from the highlands to the coast for house construction.

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