

ARCHEOLOGY ON ICE

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ABSTRACT

Archeology on Ice is a museum exhibition describing the unique archaeological discoveries found melting from ancient ice as a result of climate change. The exhibit results from a partnership between the University of New Mexico Maxwell Museum of Anthropology and the Ahtna Heritage Foundation (AHF). The exhibit was funded by the National Science Foundation and installed at the AHF *C'ek'aedi Hwnax* Legacy House in Copper Center, Alaska, where it serves as an educational resource for the AHF. It includes replicas of unique artifacts collected at ice patches and interprets artifacts from lands traditionally used by Athabascan people. This region now comprises much of Alaska's Wrangell–St. Elias National Park and Preserve and is administered by the U.S. National Park Service. The exhibit includes four videos, artifact replicas, photographs, and interpretive panels. The exhibit's development identified its primary target audiences to be Ahtna tribal members, other Indigenous people, and individuals and groups interested in the Arctic and Alaska, archaeology, and the science of climate change.

INTRODUCTION

As a result of climate warming, rare archaeological materials are emerging from ancient glaciers and ice patches worldwide, and significant archaeological discoveries have been reported from Alaska and the Canadian Yukon and Northwest Territories (Alix et al. 2012; Andrews et al. 2012a, 2012b, 2012c; Dixon 2009; Greer and Strand 2012; Hare et al. 2004, 2012; Vanderhoek et al. 2012). To better understand this phenomenon in Alaska, a research program was undertaken in Wrangell–St. Elias National Park and Preserve (WRST) to locate and preserve artifacts found at small stable glaciers known as ice patches. The project began in 2001 with funding from the National Science Foundation Office of Polar Programs (NSF-OPP Award 0613002). It was originally based at the University

of Colorado Institute of Arctic and Alpine Research and was subsequently transferred to the University of New Mexico (UNM) Maxwell Museum of Anthropology in 2007, where James Dixon continued to serve as principal investigator and Dorothy Shinn, tribal members, and Ahtna Heritage Foundation (AHF) employees continued to participate and advise the project until it was completed in 2015. A parallel research project funded by the National Park Service (NPS) in Alaska's Lake Clark National Park (LACL) was also part of the larger research program.

Ice patches are cryogenic features that were used in the past for a variety of subsistence activities. Ice patches attract caribou attempting to escape warm temperatures and insects in the summer; other game, such as ground squirrels

and ptarmigan, are often found around them as well. The people who hunted and camped at ice patches occasionally lost tools, weapons, and other objects that became frozen in the ice and preserved for thousands of years. The artifacts recovered from them, along with field observations, indicate that caribou (and possibly sheep) hunting was the most important economic activity at most ice patches in traditional Athabascan territory. The lost artifacts have remained frozen until being exposed by melting ice due to the recent increase in global temperatures.

The artifacts found at these sites provide unique insights into traditional and customary resource use by Athabascan people in specific areas of higher elevation. Most are made of organic materials, such as wood, leather, antler, and birch bark, that soon decompose after being exposed to the environment after the ice melts. Consequently, this research provides a cautionary message that as warming continues, the fragile organic artifacts emerging from melting ancient ice will be lost forever unless they are discovered, collected, and preserved shortly after they are exposed.

The research program in WRST began at the University of Colorado in 2001 and was transferred to the University of New Mexico in 2007. In its initial stages, it focused primarily on identifying ice patches that were most likely to contain artifacts using geographic information systems modeling and geomorphic and environmental analysis (Dixon et al. 2005). This was followed by aerial reconnaissance and archaeological ground survey of ice patches to determine if artifacts melting from the ice were present. Significant artifacts discovered during the course of the fieldwork include ancient arrows (some with preserved feathers and paint), hunting tools, and a partial birch-bark basket. The discoveries provide rare glimpses into perishable material culture of the Athabascan people and a unique link to traditional resource use and people living in the region today. Historic materials, including a metal knife manufactured in France and horseshoe nails, were also found.

EXHIBIT DEVELOPMENT AND DESIGN

Archeology on Ice is an outgrowth of the collaboration that developed during the field research as a product of the partnership between the AHF and UNM Maxwell Museum of Anthropology. The partnership began in 2001, when Dixon contacted the AHF, described the

proposed research, and AHF expressed interest in partnering in the research. AHF supported and endorsed the proposals submitted to the National Science Foundation, and the grants included funding for one tribal member to participate in the field survey each year. Tribal participation in the field research strengthened the partnership between the research team and the AHF and was sustained throughout the project.

The study area was large, and the only practical way to access the glaciers and ice patches is by helicopter or small fixed-wing aircraft at a few locations where landing is possible. Helicopter use in WRST is tightly controlled, and consequently field crews were small, generally consisting of only three or four people. Tribal members participating in the fieldwork were selected by AHF and included Ruth Ann (Warden) Shinn (two field seasons), Lishaw Lincoln, Albert Craig, Joey Leonard, Jason John, and Roy Hancock. Joeneal Hicks also provided valuable consultation and advice to the research team. In addition, Liana Charley-John and Taña Finnesand coordinated the logistics that enabled tribal members to visit one of the more accessible ice patches at which artifacts had been found. Subsequently, Liana Charley-John, Taña Finnesand, Martin Finnesand, and tribal elders Markle Pete, Phillip Sabon, and Elaine Sinyon were flown by helicopter to the site and shared their insights, observations, and recommendations with the researchers. Concurrently, the AHF and the National Park Service planned, and subsequently constructed, the *C'ek'aedi Hwnax* Legacy House in Copper Center, Alaska.

The principal investigator (PI) made a presentation describing the project to approximately 25 Ahtna tribal members, NPS staff, park visitors, and community members on July 29, 2011, at the Ahtna Cultural Center. Discussion during and following the presentation led to the idea that an exhibition at the *C'ek'aedi Hwnax* Legacy House might be an excellent means to locally share the research findings with a larger audience. At the same time, the AHF would also provide the Maxwell Museum at the University of New Mexico the opportunity to highlight the research with the larger university community and enhance the university's educational outreach with the development of a smaller traveling exhibit. However, it was recognized that it was essential to achieve consensus and funding before proceeding.

Subsequent conversations and discussions between AHF members and researchers led to an outline of exhibi-

it themes focusing on Ahtna customary and traditional resource use, climate change in high-altitude regions, and connections between the archaeological materials and contemporary Athabascan culture. This process resulted in a request for supplemental funding for the development and design of *Archeology on Ice* that was submitted in 2013 to NSF under UNM's existing award (# 0613002). The proposal was funded and included support for an Ahtna delegation to travel to New Mexico for initial planning. A subsequent focus group meeting was organized and hosted by AHF in Copper Center, Alaska. AHF and tribal elders, members, and the PI participated in the meeting. AHF agreed to provide photographs, video, and content review, and the Maxwell Museum agreed to produce the draft exhibit text, panels, and videos based on AHF direction and subject to AHF review. These collaborations provided both the AHF and UNM with specific direction for exhibit content and defined the practical parameters for exhibition design. AHF representatives and the PI also met with appropriate WRST personnel to incorporate their recommendations and ideas in the proposed exhibit.

The Maxwell Museum produced two sets of identical exhibit panels and videos, which were ultimately used to create three exhibits, each designed to reach a different audience. The first was scaled to meet the needs and exhibit area of the *C'ek'aedi Hwnax* Legacy House. The second was installed as a temporary exhibit at the Maxwell Museum, where it was enhanced with additional objects. The third was a small traveling exhibit that reused the panels from the Maxwell exhibit; it is available to other venues upon request through the Maxwell Museum of Anthropology.

The primary purpose of the exhibit at the *C'ek'aedi Hwnax* Legacy House is to engage local residents and visitors to the Ahtna region to consider how science and traditional cultural knowledge complement one another and to illuminate understanding about the changing environment and resource use. Furthermore, the exhibit at Copper Center enabled researchers and tribal leaders to share the project's results with local communities and residents and for local residents to share their interpretations about the significance of the archaeological discoveries. This collaborative research and educational partnership grew organically over many years and required patience, perseverance, and trust on the part of the AHF as an organization, tribal members, and the university-based researchers.

EXHIBIT CONTENT

Archeology on Ice presents the results of this decade-long project using graphic panels (Figs. 1 and 2) containing text and reproductions of select artifacts discovered during the field surveys. The exhibits also contain four short educational videos filmed in the spectacular settings of Lake Clark and Wrangell–St. Elias National Parks. The videos, which are also available online as podcasts (Dixon and Taylor 2013a, 2013b, 2013c, 2013d), capture the excitement of archaeological discovery. They include interviews with tribal members, scientists, student participants, and NPS personnel. The videos document local knowledge and observations that provide important insights about climate change and the artifacts found at these small glaciers.

Each video focuses on a different aspect of ice patch research. The first introduces ice patch resources and discusses the customary and traditional use of caribou and other resources in Ahtna culture. The second describes the contributions of ice patch archaeology to understanding past human–environment interactions and its relevance to the study of modern climate change. The third shares rare footage of ice patch archaeological finds, including the discovery of a worked caribou hide and an incredibly well-preserved arrow. The final video emphasizes the important role of Indigenous knowledge and collaboration in ice patch research and highlights important aspects of ancient technology that have been revealed by the study of glacial archaeology at various locales in North America.

COLLABORATION

An important aspect of the tribal–university partnership was the recognition of the need to bring local and public attention to the importance of collecting, preserving, and studying the materials melting from ancient ice. The exhibit at the AHF *C'ek'aedi Hwnax* Legacy House opened in November 2014. UNM graduate student Michael Grooms and James Dixon helped install the exhibit, and Dixon spoke at the opening ceremony. The opening in Copper Center was accompanied by a welcoming-home ceremony for the ice patch artifacts that were returned to WRST. The larger enhanced temporary exhibit opened at the Maxwell Museum in September 2014 and was decommissioned in May 2015. Liana Charley-John (executive director of the AHF), Albert Craig (tribal member and field

GLACIAL ARCHEOLOGY

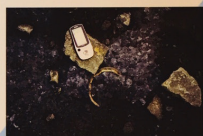
As a result of climate change, ancient ice is melting throughout the world. Although there is regional variation, annual average temperature has increased in the arctic at almost twice the rate of the rest of the earth. As a consequence, artifacts frozen in ice for thousands of years are emerging from melting glaciers.

A glacier is a mass of ice formed by the accumulation and compaction of snow. In the past, people used different types of glaciers for different purposes. People still use some glaciers as passes through mountain ranges.

The ice in valley glaciers originates from snow that falls at the heads of valleys. Valley glaciers slowly flow downhill where the older ice melts at its terminus. Because the ice in valley glaciers moves downhill with great force, they often crush and destroy the artifacts in them.



The Nabesna Glacier in Wrangell-St. Elias National Park and Preserve



This horse hoof print and these horseshoe nails found on the melting Nabesna Glacier are evidence that someone stopped and shod a horse on the ice. Artifact locations are recorded using GPS (Global Positioning System) instruments.



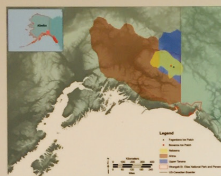
This frying pan found on a glacial moraine was damaged by the forces of glacial ice. Glacial moraines are accumulations of unconsolidated glacial debris. It was probably lost or abandoned by prospectors crossing the Nizina Glacier in the Wrangell Mountains during the 1913 Chuana Goldrush.

Figure 1. An exhibit panel from Archeology on Ice introducing glaciers and their use as passes over glaciated mountains.

research participant), and Dorothy Shinn (AHF board member and past AHF executive director) traveled to New Mexico and spoke at the exhibit opening in Albuquerque.

In addition to the exhibit, research results have been shared through a number of publications (Dixon et al. 2005, 2007; Dixon 2009; Vanderhoek et al. 2012), an unpublished master's thesis (Anderson-Milhausen 2008), and public presentations in Copper Center, Nondalton, Lake Clark, and Anchorage. Outside Alaska, the research has been the subject of public presentations in Boulder, Colorado, and Albuquerque, New Mexico, and at several national and international professional meetings in Canada, the United States, and Europe. Tribal member Ruth Ann (Warden) Shinn coauthored a publication sharing project results with local residents (Dixon et al. 2007). The *Archeology on Ice* exhibit at the *C'ek'aedi Hwnax* Legacy House in Copper Center is the property of the AHF.

ICE PATCH RESOURCES



The shaded areas represent Ahnna (brown), Nabesna (yellow) and Upper Tanana (blue). Wrangell-St. Elias National Park and Preserve is outlined in red.

The artifacts found at ice patches located in Wrangell-St. Elias National Park and Preserve are within the traditional territories of several groups of Athabaskan people. The Ahnna, Nabesna, and Upper Tanana Athabascans are descendants of people who hunted and camped at ice patches. They are historically linked to the most recent artifacts recovered from these sites. These connections make it possible to trace the use of different types of artifacts back in time, and to better understand the activities that took place at ice patch sites.

The Bonanza Ice Patch was an important place for people to hunt caribou. The animals gathered on the ice to escape summer heat and insects. Animal remains and artifacts found at ice patches indicate that caribou hunting was the most important economic activity at these sites. People also snared ground squirrels, hunted ptarmigan (a grouse-like bird), and picked berries at ice patches.



Caribou feeding at the base of the Fogmbera Ice Patch



Sections of caribou antlers like this were shaped into tools such as the arrowheads found at ice patches.

PLEASE TOUCH

Figure 2. An exhibit panel illustrating the relationship of the artifacts found at ice patches to Athabaskan traditional and customary resource use in Wrangell-St. Elias National Park and Preserve.

CONCLUSION

Collaborative research requires patience, trust building, and long-term commitments by local residents and researchers. Because tribal collaboration is important to guide the direction of the research, researchers must provide financial resources through their grants and contracts to facilitate collaboration and provide opportunities for tribal partnerships. This exhibit shares research results in ways that underscore the importance of local climate change research by focusing on the unique artifacts, glaciers, and ice patches that are disappearing due to global warming. These topics are meaningful locally, nationally, and internationally. Museums and cultural centers are important venues to share research findings with local residents and visitors. *Archeology on Ice* provides an enduring educational medium highlighting the environmental con-

text of Alaska ice patches and glaciers and their relevance to the lives and history of Native and non-Native people in Alaska, as well as the larger issues of global climate change.

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