Hunting weapon 10,000 years old found in melting ice patch

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Nothing could be further from the truth, according to Lee, a research associate with CU-Boulder's Institute of Arctic and Alpine Research who found the atlatl dart, a spear-like hunting weapon, melting out of an ice patch high in the Rocky Mountains close to Yellowstone National Park.

Lee, a specialist in the emerging field of ice patch archaeology, said the dart had been frozen in the ice patch for 10 millennia and that climate change has increased global temperatures and accelerated melting of permanent ice fields, exposing organic materials that have long been entombed in the ice.

"We didn't realize until the early 2000s that there was a potential to find archaeological materials in association with melting permanent snow and ice in many areas of the globe," Lee said. "We're not talking about massive glaciers, we're talking about the smaller, more kinetically stable snowbanks that you might see if you go to Rocky Mountain National Park."

As glaciers and ice fields continue to melt at an unprecedented rate, increasingly older and significant artifacts -- as well as plant material, animal carcasses and ancient feces -- are being released from the ice that has gripped them for thousands of years, he said.

Over the past decade, Lee has worked with other researchers to develop a geographic information system, or GIS, model to identify glaciers and ice fields in Alaska and elsewhere that are likely to hold artifacts. They pulled together biological and physical data to find ice fields that may have been used by prehistoric hunters to kill animals seeking refuge from heat and insect swarms in the summer months.

"In these instances, what we're finding as archaeologists is stuff that was lost," Lee said. "Maybe you missed a shot and your weapon disappeared into the snowbank. It's like finding your keys when you drop them in snow. You're not going to find them until spring. Well, the spring hasn't come until these things started melting for the first time, in some instances, in many, many thousands of years."

The dart Lee found was from a birch sapling and still has personal markings on it from the ancient hunter, according to Lee. When it was shot, the 3-foot-long dart had a projectile point on one end, and a cup or dimple on the other end that would have attached to a hook on the atlatl. The hunter used the atlatl, a throwing tool about two feet long, for leverage to achieve greater velocity.

Later this summer Lee and CU-Boulder student researchers will travel to Glacier

National Park to work with the Salish, Kootenai and Blackfeet tribes and researchers from the University of Wyoming to recover and protect artifacts that may have recently melted out of similar locations.

"We will be conducting an unprecedented collaboration with our Native American partners to develop and implement protocols for culturally appropriate scientific methods to recover and protect artifacts we may discover," he said.

Quick retrieval of any organic artifacts like clothing, wooden tools or weapons is necessary to save them, because once thawed and exposed to the elements they decompose quickly, he said.

An estimated 10 percent of Earth's land surface is covered with perennial snow, glaciers and ice fields, providing plenty of opportunities for exploration, Lee said. However, once organic artifacts melt out of the ice, they could be lost forever.

"Ninety-five percent of the archaeological record that we usually base our interpretations on is comprised of chip stone artifacts, ground stone artifacts, maybe old hearths, which is a fire pit, or rock rings that would have been used to stabilize a house," Lee said. "So we really have to base our understanding about ancient times on these inorganic materials. But ice patches are giving us this window into organic technology that we just don't get in other environments."

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