

## A Glacial Archaeology Update from the Canton of Valais, Switzerland (and a call for citizen scientists)

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It has been a decade since a major glacial archaeological project was funded by the Swiss National Science Foundation to locate archaeological material at high altitudes in the Pennine Alps (SNSF 2022), on the southern border of the Canton of Valais in Switzerland. Over the course of that project, which concluded in 2014, historians, archaeologists, and geographers worked together to locate areas of high glacial archaeological potential to preserve cultural heritage (Rogers *et al.* 2018; Eschmann Richon 2014). Models were created using Geographic Information Systems (GIS) and several locations were prospected to test the efficacy of the model results (Rogers and Curdy 2015; Rogers, Fischer, and Huss 2014; Rogers, Collet, and Lugon 2014). Additional modeling was conducted for the Bernese Alps (northern border of Valais) after the conclusion of the initial Pennine Alps project (Figure 1). There are still many sites, with designations of both high and low glacial archaeological potential, which have not, and may not ever be, prospected due to the vast and rugged terrain in which they occur. However, work is still on-going, and this update will comment on three glacial archaeological advancements that have occurred in the Canton of Valais over the last several years.

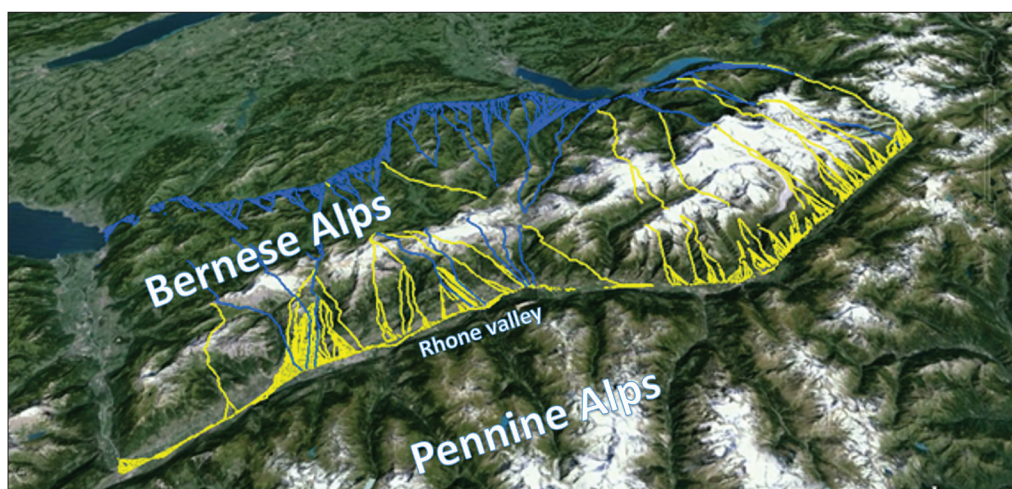


Figure 1. Least cost path model of potential paths traversed through the Bernese Alps; in yellow, from south to north; in blue, from north to south.

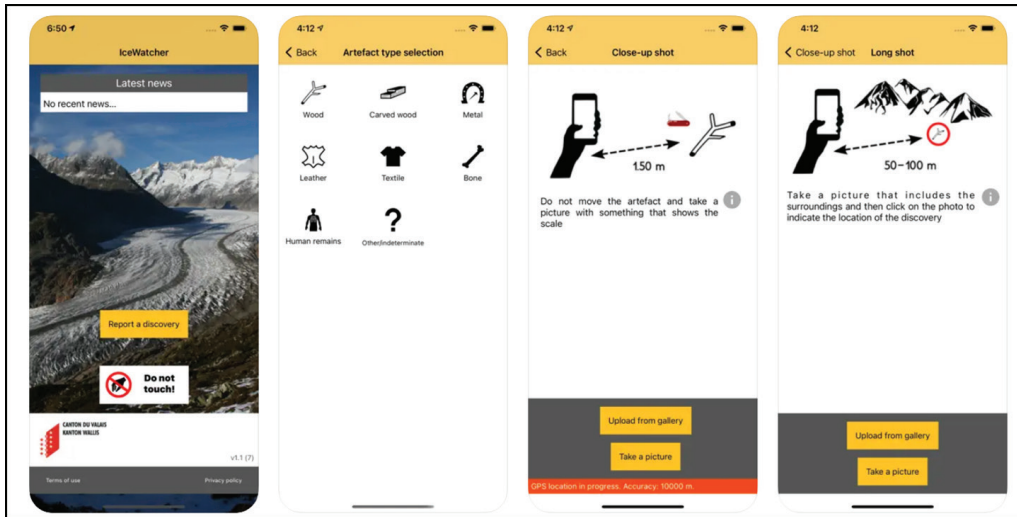


Figure 2. Overview of the IceWatcher application from the iOS platform (IceWatcher 2022).

### Recent archaeological finds from modeled locations: Col Collon

The Col Collon is currently deglaciated and located in the Pennine Alps between Switzerland and Italy. Due to the location of the pass, and the timing of deglaciation, it was considered a pass of “high glacial archaeological potential” in a GIS model (Rogers, Fischer, and Huss 2014). Thus, archaeologists visited the site to investigate the model results in 2018. Prospection led to the collection of several fragments of wood with no obvious traces of shaping or alteration. However, any wood found at high altitudes (above the treeline) is assumed to have been transported there by humans. The wooden fragments were dated to two periods during the Iron Age, 8th–5th century BC, and several were determined to be walking sticks or route marker stakes, and Iron Age, 4th–2nd century BC (Curdy and Nicod 2020).

Another recent notable discovery near the Col Collon was a sculpted wooden, human-like, object which was discovered by mountaineers in 1999. Like many regional glacial archaeological finds, this object, dated to the Iron Age, 2nd–1st century BC. It was collected and not reported to authorities and spent the last ~20 years on the wall of a mountaineer’s home (Curdy and Nicod 2020). Unfortunately, this is not a unique circumstance as most glacial archaeological finds are discovered by non-experts. However, the situation is a reminder that a concerted effort should be made to educate mountain-goers about the importance of archaeological retrieval in high altitude environments.

### Recent archaeological finds from modeled locations: Col de la Forcle

Col de la Forcle, located on the northern border of Valais in the Bernese Alps was designated as a pass of interest after a GIS least cost paths investigation (Curdy, Lugon, and Rogers 2019). Pointed wooden marker poles from the Roman Period, 1st–3rd century AD were discovered on the margin of a disappearing ice patch called “Glacier de

la Forcle” located at this site (Curdy, Gubler, and Hafner 2021). Ongoing investigations show that these wooden marker poles were originally about 1.2 m long with carefully crafted tips and ends.

### Integrating citizen scientists

In the Canton of Valais, glaciers are melting at alarming rates. For this reason, it is necessary to establish a coordinated response among Alpine heritage institutions of neighboring countries and involve non-archaeologists in the discovery, collection, and preservation of archaeological items located in high melt areas. In 2018, Ralph Lugon developed a participatory science project to mobilize citizens who frequent high-altitude regions. The core of the project was the development of an application to communicate georeferenced data to the cantonal authority. During the summer of 2021, the Cantonal Office of Archaeology of Valais (Canton du Valais 2022) launched this participatory science project. The application, called *IceWatcher*, has been made freely available for iOS and Android devices (Figure 2). This application allows users to follow a standardized procedure to photograph their discoveries, then transmit this georeferenced information to the authorities, who decide whether to intervene in the field or not. The application, created by Swiss company Biolevision sàrl based on iNaturalist (iNaturalist 2022), also allows hikers and mountaineers to communicate and share their archaeological observations on a dedicated platform. Since last year (2021), the app has solicited approximately 15 announcements of archaeological finds near Valais glaciers. About half of those announcements are related to archaeological materials, and these reports are being individually investigated. This is an interesting and critical first step in soliciting citizen scientists in high altitude environments to support glacial archaeology. With increased melt rates and decreased archaeological resources, citizen scientists may prove to be the most promising method for locating and protecting cultural heritage at high altitudes.

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## Glacial Archaeology in Inner Asia

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Perhaps nowhere is the future of glacial archaeology more promising or more uncertain than in the high mountains of Inner Asia. This vast region stretches from the Tibetan Plateau and the grand Himalaya in the southeast, westward through the high Hindu Kush, Pamir, and Tian Shan of Central Asia, and northward through the high Sayan-Altai mountain chain separating the steppes from Siberia. Vast regions of the interior of the Asian continent are defined by the geology and ecology of high mountain zones. In most dry regions, rainfall and snowpack make high mountains into ecological “hotspots” with greater biological productivity that sustain plant and animal communities through hot summer months. Mountains in Inner Asia rarely function as barriers but instead serve as cultural corridors, historically facilitating travel and trade via mountain passes and across the continent through vast networks including the Silk and Tea-Horse Roads. In many areas, even extreme altitudes have been occupied since the earliest chapters of human history.

Despite the significance of mountain corridors in the broad trajectory of the human story in Asia, many of these areas are poorly represented in the archaeological record. Most historical texts were written by lowland agricultural civilizations of areas like the Tigris/Euphrates, Indus, or Yangtze, but fewer records survive from the influential cultures and kingdoms of the high country. Many areas suffer from underrepresentation in the archaeological record, where fieldwork can be difficult, expensive, and time intensive. Cultural factors such as the ubiquity of mobile pastoralism compound this issue further, because these cultures often leave behind shallow archaeological deposits and organic material culture does not preserve well in these depositional contexts.

Glacial archaeology is poised to make a significant impact on archaeological narratives in Inner Asia. While the discipline remains in its formative stages across most