BOX 11.2 FIRE AND ICE: ARCHAEOLOGY AND OUR CHANGING CLIMATE

Our rapidly changing climate has been a double-edged sword for archaeological sites and resources. Dramatic changes in weather patterns and temperatures have revealed previously unknown archaeological sites and artifacts, but these changes have also placed such resources in grave danger. If archaeologists and governments do not act promptly, sites and artifacts may be destroyed or looted.

Two new fields of archaeological research have emerged due to climate change: ice patch archaeology and fire archaeology. Ice patch archaeology is the study of archaeological sites and artifacts made visible due to melting ice patches found at high altitudes. Ice patch archaeologists are working in the Yukon, the Alps, Norway, and the United States to save artifacts revealed due to increasing temperatures. What is particularly exciting about ice patch archaeology is that it has resulted in the recovery of organic materials rarely found on traditional dirt-based archaeological projects. Organic artifacts, such as objects made out of wood, textiles, plant fibers, and bone, are unusual archaeological discoveries because they degrade quickly in the soil.

Ice patch archaeology has produced some of the oldest organic artifacts in the world (Muckle 2012). Canada's Yukon Ice Patches, located in First Nations territory, have recovered one of the oldest moccasins in Canada, dating to 1,400 years ago (Hare et al. 2012, 125). At Schnidejoch, a ridge of mountains located in the Swiss Alps, the left side of a pair of pants or leggings was found (Schlumbaum et al. 2010). It is considered to be an exceedingly rare and exciting find, considering that it dates to the Neolithic period and is made of leather. Further research was done on the leather to determine what animal was used to make the leggings. Upon further analyses, scientists discovered that the pants were made from a goat and, more importantly, a goat that is not present in contemporary Europe. The goat is only found in Southeast Asia, which provides new information about animal domestication and migratory patterns across the world.

You may be wondering why people would have sought high altitudes and crossed ice patches in the past. Ice patches served a variety of purposes, which differ across time and place. Schnidejoch is the longest continuously used pass, as artifacts dating to the Neolithic period, "the early Bronze Age (4100–3650 cal BP), the Roman period (2150–950 cal BP), and the Medieval period (1250–1050 and 650–450 cal BP)" have been recovered (Reckin 2013, 351). Researchers believe Schnidejoch was desirable because people used it for travel and trade (Reckin 2013, 352). Scholars believe that Canada's Yukon Ice Patches may have served multiple purposes. Woodland caribou have historically migrated to these ice patches to escape insects, cool down, and find a continuous water source during the summers. Indigenous Peoples recognized the caribou's migratory patterns and hunted them on the ice patches. Nearly all of the artifacts recovered from ice patches in the Yukon are associated with hunting, including darts, stone projectile points, and arrows (Hare et al. 2012, 121). This stands in contrast to artifacts recovered from the Alps, which are mostly related to human and not hunting activities. Some scholars have interpreted the discovery of basketry and containers found in the Olympic Mountains of Washington State and in the Yukon (Reckin 2013, 325) as an indicator that people were carrying ice off of the mountains as a water source. Finally, some researchers postulate that people may have used ice patches as an early refrigeration technique to keep meat cool.

Despite the exciting new information these organic artifacts have revealed about the past, ice patch archaeology presents significant challenges. Ice patches are typically difficult and expensive to access. In some cases, they are only accessible via helicopter or plane (Hare et al. 2012, 120). Some ice patches can only be explored during warmer seasons, meaning that archaeologists may only have a month or two of the year during which they can retrieve artifacts. Thawed-out organic artifacts must also be collected within a short period of time, as exposure to the elements, such as wind, UV radiation, and sunlight, means organic artifacts will likely disintegrate within a few years' time. The provenience of ice patch discoveries is also problematic, as artifacts typically drift to the base of the ice patch as the snow melts (Hafner 2012, 193).