



SPARC

Snow Patch Archaeological Research Cooperation

SPARC is a multidisciplinary research project focused on ancient cultural, biological and climatic remains, found on melting alpine snow patches in the mountains of Norway.

Many of the arrows, bows, tools, textiles, bones and antlers discovered on these sites are quite ancient, as are the patches' frozen cores where some objects have been preserved through thousands of years. The ice cores within alpine snow patches contain important climatic information about how these structures have both grown and declined, both today and in the past. The archaeological and zoological objects recovered are also of considerable cultural and scientific value.

The primary objective of the SPARC project is to carry out a series of focused and detailed studies of the snow patch phenomenon. Ultimately, the results of these studies will be drawn together in a set of knowledge-based recommendations aimed at the national and local authorities that face the challenge of managing these important cultural and natural resources.

The project is organized as a series of 6 independent but interrelated studies (Work Packages).

There are two archaeological studies. The first (WP1) involves a detailed radiological dating program and technological analysis of selected artefacts recovered from snow patch sites. This study asks

- How old are the artefacts and arrows found on snow patches?
- How have the arrows and arrowheads changed through time?
- How do new ideas and technologies become introduced and adopted?

The second study (WP2) will investigate the cultural historical implications of how humans used alpine and subalpine sites such as snow patches in the past. This study asks:

- How does snow patch hunting relate to other forms of reindeer hunting/ trapping in Southern Norway during the period?
- What can this tell us about changes in settlement patterns and social structure in the period AD 1000-1700?

The glaciological study (WP3) focuses on fundamental aspects of snow patch formation and degradation by way of in-field monitoring, measurements, sampling and subsequent analysis and modeling. The goal is to answer fundamental questions such as:

- How old are the snow patches, and how old is the ice?
- What are their thermal and dynamic characteristics?
- How sensitive are the ice patches to climate change?
- Are there spatial variations in ice patch characteristics?

Taphonomical studies (WP4) provide a crucial link between the artefacts themselves and the sites they were preserved in. This study involves analysis of series modern samples that have been installed at an alpine snow patch. These samples will be compared with ancient artefacts from museum collections in order to uncover something of the nature of artefact deterioration and degradation. The taphonomical study seeks to find out:

- Once artefacts are released from a snow patch, what happens to them?
- How fast do they degrade and decay?
- How does the rate of degradation vary from zone to zone on a snow patch?

The zoological study (WP6) involves a DNA analysis of samples taken from a selection of the bone, antler and sinew elements often found on ancient artefacts from snow patches. The results of this analysis may cast light on how animal populations such as reindeer have varied and developed through time.

The project's final study (WP5) will synthesise both the results and knowledge gained from the SPARC project in a series of guidelines relevant to the future management of alpine snow patches as natural and cultural historical resources. The questions that drive this synthesis are:

- How should we best manage archaeological snow patches as national heritage sites?
- What time-frames are involved in the future degradation of finds and sites?

The SPARC project is collaboration between a number of Norwegian and Scandinavian universities, museums and research institutions. Assisting the project group is a user group of local actors and partners concerned with snow patches as cultural and scientific resources. A scientific advisory group of international experts from the different fields also supports the project by way of dedicated meetings and informal collaboration and advice.