

Jan Mayen – The Pleistocene-Holocene glacial history of an active volcanic island

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The volcanic island of Jan Mayen, situated in the Norwegian – Greenland Sea, has an arctic – maritime climate influenced by the northwards flowing Atlantic current and the southwards flowing East Greenland current. Small shifts in these current systems will likely influence the climate on Jan Mayen which suggests that the island could be very sensitive to climate change. In 2015 we started a project funded by the Research Council of Norway to investigate glacial and climate history of the island. Below we report preliminary results of the glacial history.

Presently, the active volcano Beerenberg has an ice cap with several outlets, some of them reaching down to sea-level. The Little Ice Age (LIA) marginal moraines are well developed, and preliminary ³⁶Cl cosmogenic dates give reasonable LIA ages. Whether or not the entire island has been ice-covered previously has been a matter of controversy. A moraine ridge at present sea-level with an associated marine terrace are interpreted to represent the Last Glacial Maximum (LGM) and the marine limit, respectively. This, in addition to other geomorphological observations, are taken to indicate that the entire island was ice-covered, and that glaciers extended at least down to present sea level. ³⁶Cl cosmogenic dates indicate that glaciers had retreated considerably by some 18 – 19 ka BP.

Stratigraphic investigations indicate that the island of Jan Mayen was covered by ice also prior to LGM. In coastal sections at several locations, glacial diamictites at stratigraphic position below LGM are found in association with lava flows. Interaction between glaciers and volcanic eruptions cause complex sediment associations, but also provide opportunity for dating glacial events.