

Project acronym: GLACIGREEN

Project title: Holocene glacial oscillations in Zackenberg area (Greenland)

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Discipline: Earth Sciences & Environment

Station(s): Zackenberg Research Station, Greenland

The High Arctic has been among the fastest warming regions on Earth during the last decades. In Greenland, such warming is having important implications on glacier mass balances and driving substantial geoecological changes in ice-free areas, but many effects are yet not understood.

Glaciers and permafrost-related features are among those expected to show the most dramatic local responses to changing climate in Greenland. The consequences of this warming trend on polar terrestrial and marine ecosystems may also affect the entire Earth through a wide range of feed-back processes and climate teleconnection patterns.

GLACIGREEN will focus on Zackenberg area, an ice-free site located in the NE of Greenland to reconstruct past glacier dynamics in the area. We will apply a multiple-dating approach combining absolute (cosmogenic, lichenometry, OSL,  $^{14}\text{C}$ ) and relative dating techniques (Schmidt hammer, Equotip) to reconstruct the spatio-temporal patterns of glacial advances and retreats since the onset of the deglaciation. The analysis of remote sensing, aerial imagery and glaciological data, will elucidate whether the recent glacial retreat in NE Greenland is part of natural climate variability or it results of the amplification of the feedback effects of climate change in the High Arctic.

Key sites will be nunataks (i.e. rocky areas surrounded by glaciers) and deglaciated coastal environments, which can provide data on glacier thinning rates as well as the onset of the deglaciation. The comparison of past glacier thinning rates with recent/contemporary dynamics will allow framing recent rates of glacier shrinking with the Late Pleistocene-Holocene record.