



## **Is the regional hydrographic variability during the Holocene reflected in remote glacier-proximal fjords? – A case study from the Wahlenbergfjord (Svalbard)**

Martin Bartels (1), Jürgen Titschack (1), Kirsten Fahl (2), Rüdiger Stein (2), and Dierk Hebbeln (1)

(1) MARUM - University of Bremen, Bremen, Germany, (2) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany

Situated at the juncture of Arctic and Atlantic waters, the Svalbard Archipelago is ideally located to assess local (mainly glacier-related) vs. regional (hydrographic) environmental variabilities. Due to exceptional high sedimentation rates in Svalbard's fjords, sediments from these locations can be considered as temporally highly resolved archives of (pre-) Holocene environmental conditions. Holocene glacier dynamics, palaeoceanography and sea ice conditions in the remote, glacier-surrounded Wahlenbergfjord (eastern Svalbard) were reconstructed based on sedimentological, micropalaeontological and geochemical records. Data illustrate a high meltwater discharge between ~11.3 and ~7.7 ka (during the summer insolation maximum) when relative warm Atlantic-derived waters were advected and upwelled resulting in reduced sea ice coverage. Around 7.7 ka, a strengthened influence of Arctic Water is recognizable, replacing the dominating inflow of Atlantic-derived waters. This rapid hydrographic shift is also evident in the benthic foraminiferal fauna at Svalbard's margins. During the late Holocene (~3.1–0.2 ka), glaciers surrounding the Wahlenbergfjord likely advanced, reflecting neoglacial conditions. Glacier growth was possibly enabled by the simultaneously extending sea ice cover causing a decoupling of cold atmospheric temperatures from the advection of relative warm intermediate waters. Our study illustrates the potential of remote, glacier-proximal study sites to reflect rapid as well as longer-term regional changes, which might even superimpose local influences.