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Sea ice proxies, marine environmental change, and human societies in Northwest Greenland over the past ca. 4500 years

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Greenland has been inhabited for only ca. 4500 years, but several human colonization events and cultural transitions occurred during this period. This work is part of the ICE-ARC project – Ice, Climate and Economics in the Arctic (EU FP7), aimed at understanding and quantifying the multiple stresses involved in the change in the Arctic marine environment, with particular focus on the rapid retreat and collapse of the Arctic sea ice cover. The overall goal of the project is to assess the climatic (ice, ocean, atmosphere and ecosystem), economic and social impacts of these stresses on regional and global scales.
Marine sediment cores were retrieved from the Inglefield Bredning fjord system in the Qaanaaq region, Northwest Greenland, and are being analysed for various climate and environmental proxies, including biological indicators (e.g. dinoflagellate cysts, diatoms), biogeochemical elements (biogenic silica, XRF scanning), and sea-ice specific biomarkers (IP25). We will present the first data from this core material, consisting of a spatial study of sea ice and productivity proxies in 13 surface sediment samples (IP25, biogenic silica, diatoms, and dinoflagellate cysts) which will be compared with satellite-derived sea ice cover data for the Qaanaaq region/ northern Baffin Bay.
This spatial study will serve as basis to reconstruct sea ice variability in the area over the past ca. 4500 years, and will be combined with historical and archaeological data in order to identify possible links between past changes in climate and sea ice conditions, and events of human migration and cultural transition in Greenland.