

Project information

Keywords

sea ice, ocean temperature, climate change

Project title

HOLOCENE OCEAN AND SEA ICE HISTORY AT NORTH-EAST SVALBARD – FROM PAST TO PRESENT WARM EXTREMES (HOLIS)

Year

2017

Project leader

Katrine Husum

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)

80°32.6' N, 23°31.4' E

Participants

Norsk Polarinstitutt, UNIS, UiT - Norges Arktiske Universitet, British Antarctic Survey, University of Plymouth, Universitetet i Bergen, National Centre of Antarctic and Ocean Research (India)

Flagship

Arctic Ocean

Summary of Results

The age model for sediment core, JR142-11-GC, from the Kvitøya Through, NE Svalbard was finalized after receiving additional radiocarbon dates in 2017. Sediment accumulation rates are relatively high enabling reconstructions on a decadal temporal resolution. The final robust age model support that the outer part of the Kvitøya Through show a similar development of bottom water temperatures during the early Holocene as along the main pathway of north flowing Atlantic water.

Analysis of an additional sediment core, HH15-06-GC from the inner part of the shelf, outside of Duvefjorden was initiated in 2017. The sediment core will enable a high temporal resolution reconstruction of ocean temperatures and sea ice during the early Holocene. The results show a glaciomarine environment throughout the Holocene with fluctuations of temperature and salinity. A high frequency of *Elphidium* species (benthic foraminifera) in the late Holocene may suggest periods of slightly reduced salinity. The very bottom of the core, Younger Dryas, has a high frequency of *Stainforthia* species (benthic foraminifera) indicating less ventilation and stratification of the water masses. Analyses of biomarker samples (sea ice reconstructions) and stable isotope measurements reconstructions of ocean temperature and salinity) are ongoing and will be finished in spring 2018.

Published Results/Planned Publications

Husum, K, Belt, S, Ninnemann, U, Koseoglu, D., Divine, D, Hogan, K., Noormets, R, Smik, L. & Miettinen, A (2018). Holocene sea-ice and ocean temperature evolution on the continental margin off northeastern Svalbard. Poster presentation (#EGU2018-8072) at

European Geophysical Union General Assembly, April 8-13 2018, Wien, Austria.

Husum, K, Belt, S, Ninnemann, U, Koseoglu, D., Divine, D, Hogan, K., Noormets, R, Smik, L., Miettinen, A, Mohan, R & Godtliebsen, F. (in prep). Early Holocene sea ice fluctuations in the European Arctic. Intended for Paleoceanography.

Budget in accordance to results

	Original budget	Updated budget
Lab engineer salary	325	417
Other lab costs	125	73
Travel*	50	10
Sum	500	500

*Only travel in connection with lab work at UNIS. The cheapest (and most efficient) solution was to go to UNIS and collect the samples myself.

Could results from the project be subject for any commercial utilization

No

Conclusions

All analysis has been completed for sediment core JR142-11-GC. The analysis of sediment core HH16-05-GC is soon to be finished. Additional radiocarbon dating is necessary for HH16-05-GC in order to obtain a robust age model confirming the regional patterns of sea-ice evolution and ocean warming during the Holocene. Results will be presented at conference in April 2018 and when the last radiocarbon dates have been obtained, a publication will be prepared based on results for both sediment cores.