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## Paleoenvironmental changes during the last 2 ka BP in the Eastern Side of Fram Strait

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Polar regions regulate the climate through the heat exchange between ocean and atmosphere, the sea ice formation or melting, and bottom water formation. Lately, the scientific community has been focusing on the study of the last 2000 years. This interval gives information about climate natural variability versus change induced by human activity. Moreover, the studies of environmental changes recorded in this period offer the possibility to understand how our climate may evolve in the near future. This study is focused on the last 2 ka BP and has the aim to understand the paleoenvironmental variations in the eastern side of Fram Strait, through multidisciplinary micropaleontological and sedimentological analyses, focussing on the diatom assemblages. Two long Calypso cores GS191-01 PC (19.68 m) and GS191-02 PC (17.37 m) were collected on the Bellsund and Isfjorden Drift, during the expedition of RV G.O. Sars (5<sup>th</sup>–15<sup>th</sup> June 2014), in the framework of the project Eurofleets-2 PREPARED. Here we present the study of the first 80 cm for core GS191-01PC and the first 18 cm for core GS191-02 PC corresponding to the last 2 ka years BP. The investigated sedimentary sequence is dominated by muddy, bioturbated sediments with very rare/sparse IRD (Ice Rafted Debris). The Diatom assemblage was analysed every 2-cm, corresponding to a resolution of 30 years for GS191-01PC and at every 1-cm in core GS191-02PC, corresponding to a resolution of 126 year. On the basis of the age model proposed by Caricchi et al. (2019), the multi-proxy analyses on the diatoms and foraminifera assemblages, and sedimentological data, allowed us to distinguish in the record four different climatic periods indicated as Units.

Unit A (2000 - 1500 cal yr BP) is the older, and indicates relatively warm conditions, suggesting the influence of warm water with a cooling period between 1800 to 1700 cal yr BP, characterized by increased sea ice coverage and the presence of cold water masses.

In unit B (1500 - 1300 cal yr BP) is period of cooler conditions compared with the previous one, and it is characterized by the presence of extended sea ice and a minor inflow of the warm water.

Unit C (1300- 700 cal yr BP) records a warming surface water with presence of freshwater of continentally origin. Unit C ends with the worsening of climatic conditions characterized by a progressive cooling.

Unit D (700 cal yr BP to recent) represents a cooling period characterized by extended sea ice coverage and an increased distribution of cold-water taxa.

### References:

- Agaard-Sorensen S., Husum K., Werner K., Spielhagen R.F., Hald M. & Marchitto T.M. (2014) - A late Glacial- Early Holocene multiproxy record from the eastern Fram Strait, Polar North Atlantic. *Marine Geology*, 255, 14-26.
- Caricchi C., Lucchi R.G., Sagnotti L., Macri P., Di Roberto A., Del Carlo P. et al. (2019). A high-resolution geomagnetic relative paleointensity record from the Arctic Ocean deep-water gateway deposits during the last 60 kyr. *Geochemistry, Geophysics, Geosystems*, 20, 2355-2377.