

EGU2020-7248

<https://doi.org/10.5194/egusphere-egu2020-7248>

EGU General Assembly 2020

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The Norwegian node for the European Multidisciplinary Seafloor and water column Observatory

Thibaut Barreyre¹, Ilker Fer², and Bénédicte Ferré³

¹Department of Earth Science, University of Bergen, Bergen, Norway (thibaut.barreyre@uib.no)

²Geophysical Institute, University of Bergen, Bergen, Norway (ilker.fer@uib.no)

³CAGE - Centre for Arctic Gas Hydrate, Environment and Climate, UiT the Arctic University of Norway in Tromsø, Tromsø, Norway (benedicte.ferre@uit.no)

NorEMSO is a coordinated, large-scale deep-ocean observation facility to establish the Norwegian node for the European Multidisciplinary Seafloor and water column Observatory (EMSO). The project aims to explore the under-sampled Nordic Seas to gain a better understanding of the critical role that they play in our climate system and global ocean circulation. An overarching scientific objective is to better understand the drivers for the temporal and spatial changes of water mass transformations, ocean circulation, acidification and thermo-chemical exchanges at the seafloor in the Nordic Seas, and to contribute to improvement of models and forecasting by producing and making available high quality, near real time data. NorEMSO will achieve this by combining expansion of existing and establishment of new observatory network infrastructure, as well as its coordination and integration into EMSO.

NorEMSO comprises of three main components: moored observatories, gliders, and seafloor and water column observatory at the Mohn Ridge (EMSO-Mohn).

Moored observation systems include an array of four moored observatories located at key positions in the Nordic Seas (Svinøy, Station M, South Cape, and central Fram Strait).

Gliders will be operated along five transects across both the Norwegian and the Greenland Seas to monitor circulation and water mass properties at those key locations. Transects in the Norwegian and Lofoten basins will focus on monitoring the Norwegian Atlantic Current, and a transect in Fram Strait will monitor properties and variability in the return Atlantic Water along the Polar Front in the northern Nordic Seas. In addition, transects in the Greenland and Iceland Seas will address the water mass transformation processes through wintertime open ocean convection, and the southbound transport of surface water from the Arctic Ocean and dense water that feeds the lower limb of the Atlantic Meridional Overturning Circulation in the East Greenland Current.

EMSO-Mohn will establish, at the newly discovered hydrothermal site on the Mohn Ridge, a fixed-point seabed-water-column-coupled and wireless observatory with a multidisciplinary approach – from geophysics and physical oceanography to ecology and microbiology. It is primarily directed at understanding hydrothermal fluxes and associated hydrothermal plume dynamics in the water

column and how it disperses in an oceanographic front over the Mohn Ridge.

Following EMSO philosophy, NorEMSO will provide data and platforms to a large and diverse group of users, from scientists and industries to institutions and policy makers. The observations will serve climate research, ocean circulation understanding, numerical operational models, design of environmental policies, and education.