

Benthic communities, the organisms living on and in the seafloor, are an important part of all marine ecosystems. The functioning of these communities is closely related to biological processes occurring in the water column through the circulation of organic matter, energy and nutrients between the seabed and the water column. The benthic fauna feeds on organic matter produced in the surface layers of water, which receives enough sunlight necessary for photosynthesis. On the other hand, benthic organisms release nutrients into the water column, and are themselves food for organisms from higher trophic levels, such as fish.

The progressing climate change, however, is expected to have a significant impact on benthic communities. In particular, two of the projected changes may have a strong impact on the functioning of benthic communities and marine ecosystems. First, an increase in water temperature may shift the range of some boreal species toward higher latitudes. Secondly, due to changes in the structure of phytoplankton communities and increased thermal stratification of sea water, the quantity and quality of sedimenting organic matter that is the food of benthic organisms will probably also change.

Therefore, the main goal of this project is to determine how the progressing climate change will impact seafloor communities occurring at various depths along the European Boreal-Arctic coast. This will be achieved by examining three different aspects of benthic communities: a) species composition, b) their functional structure, and c) the structure of the food webs in several, possibly similar, fjords along a latitudinal gradient from southern Norway to the Svalbard archipelago. Due to the fact that the samples will be collected along the latitudinal gradient, along with which the environmental conditions change, it will be possible to forecast changes in benthic communities. This approach is often used in research on the impact of climate on the environment, especially in cases where no historical data showing the state of the environment and fauna in the past are available.

The data obtained as part of this project will allow a comprehensive assessment of the impact of climate change on the benthic fauna of fjords and will allow to determine what consequences these changes will have for the functioning of marine ecosystems along the European Boreal-Arctic coast.