



Photo: Helga Bára Mohr Vang

About the Faroe Shelf Ecosystem

The importance of marine resources and ocean observation to the Faroe Islands

The Faroe Islands is an archipelago comprised of 18 islands located at 62°N in the sub-arctic North Atlantic. The shelf and surrounding oceanic waters support a high level of biological activity. Large, diatom-based phytoplankton blooms drawdown significant amounts of atmospheric CO₂ and support rich marine ecosystems that include commercially important fish stocks, seabird colonies and aquaculture production. Marine resources dominate the Faroese economy with aquaculture and fisheries comprising approximately equal shares that account for >85 % of total export value. The Faroe Islands has a long tradition of monitoring its surrounding marine environment with multi-parameter observations beginning in the eighties and some observations stretching back over 100 years. A sustained observation programme is guaranteed by core strategic government funding and a brand new multi-purpose research vessel that will be commissioned in 2020.

Coastal to open ocean connectivity at the Atlantic-Arctic Boundary

Faroe Shelf water is characterised by strong tidal currents that continuously mix and homogenise shelf water. Key observations at a few strategic locations therefore provide a representative view of the wider shelf ecosystem. Shelf waters are separated from surrounding oceanic waters by a tidal front, although significant exchange across the front results in a high-degree of connectivity between the shelf and open ocean. Large-scale oceanographic and climatic features of the north Atlantic are thus propagated onto the shelf with observable impacts on ecosystem structure and food-web dynamics. The hydrographic structure around the Faroe Islands results in several key pathways connecting the Atlantic to the Arctic.

The links between climate, diversity and ecosystem services

Understanding the links between climate, biological diversity and ecosystem services requires an integrated end-end ecosystem observing approach. Our observing programme has this specific objective in mind. The physical oceanography programme addresses how large scale oceanographic and climate features impact biogeochemical exchanges between ocean and shelf environments. A detailed biogeochemical observation programme, that includes a genomic observatory component, tracks the impact of these fluctuating biogeochemical properties on production and diversity throughout a well-characterised marine food-web. Finally, intensive survey efforts of demersal and pelagic fish stocks, in addition to aquaculture production, are able to provide a link to understand how climate-driven changes might ultimately impact marine ecosystem provisioning services.