

ICES/PICES 6ZPS 2016/S2

Zooplankton community structure and size spectra linked to phytoplankton and hydrographic features on the Faroe Shelf in spring

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The Faroe Shelf water is surrounded by a persistent front at the 100-130 m bottom contour which provides a fair, although variable, degree of isolation between the on-shelf and off-shelf waters. This allows the Faroe Shelf water to support a relatively uniform ecosystem, which is distinct from the surrounding waters. The shelf plankton communities can generally be characterised as neritic, with variable influences of the surrounding ocean. Since 1997, regular sampling of zooplankton, chl *a* and hydrographic data have been carried out in late April, studying the match-mismatch between spring bloom, zooplankton reproduction, and the occurrence of first-feeding fish larvae. During spring, while zooplankton in the off-shelf environment is dominated by the copepod *Calanus finmarchicus*, the zooplankton on the Faroe shelf is more diverse with high abundance of neritic copepod species and variable amounts of *C. finmarchicus* and meroplanktonic larvae. Our observations indicate that the local production of zooplankton in spring is highly dependent on the phytoplankton biomass, which in turn is affected by the exchange between the shelf and off-shelf waters. In years with high exchange rates phytoplankton concentrations in April are lower than when exchange is low. However, high exchange rates also result in high zooplankton biomass due to advection of large-sized individuals of *C. finmarchicus* onto the shelf. Thus, variable exchange rates between the Faroe Shelf and the surrounding waters is a main factor controlling the zooplankton community structure, zooplankton size spectra and hence feeding conditions of first-feeding fish larvae in spring on the Faroe shelf.

Keywords: Faroe Shelf, phytoplankton, zooplankton, salinity, temperature, exchange rate, reproduction

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