



Identifying distinct phytoplankton regions based on ocean colour data supplemented by in-situ and model data

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The Faroe Shelf hosts a rich and diverse marine ecosystem, which sustains a large portion of the economy of the Islands. The primary production, even though often referred to as being important to the higher trophic levels, is still not thoroughly understood.

A high resolution chlorophyll time series from coastal station S, dating back to 1997, has given valuable information about the phytoplankton concentrations on the central shelf, and interannual fluctuations (with a factor of 4-5) in this time series have been linked to several other biological indicators. However, with regards to phytoplankton and primary production farther off-shore, only CTD fluorescence observations from research cruises are available and a thorough analysis of these temporally and spatially scattered data is difficult to conduct and yet to be done. Thus, the spatial extent of the region, for which the station S phytoplankton concentrations are representative, is not well defined.

In this study we compare satellite ocean colour data from 1998-2015 with in-situ data from station S and identify the region which station S represents. Moreover, we use the ocean colour data to identify biogeographical regions in which phytoplankton is uniquely and coherently varying and compare these with the breeding and feeding grounds of commercially important fish stocks.

The surface chlorophyll pattern does not necessarily represent the primary production in the water column. We therefore supplement the results with hydrographic observations and model simulations and from these extract information about the total carbon production in the various regions.

The ocean colour data are consistent with the in-situ observations and the results from combining these with the other data types have enhanced our understanding of timing and strength of the phytoplankton spring bloom farther off-shore and contribute to the understanding of the shelf ecosystem in general.