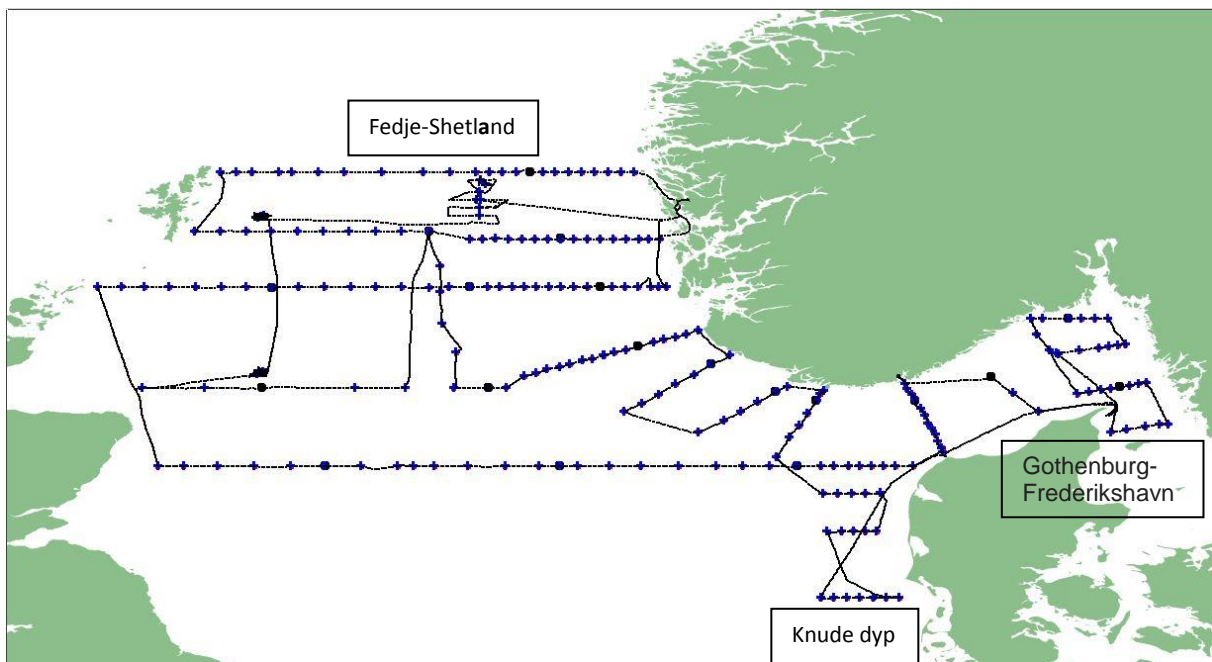


The Ecosystem Cruise of the North Sea-Skagerrak is now completed



Cruise diary: April 11th to May 9th on the "G.O. Sars ", sampling the North Sea and Skagerrak. During four weeks, measurements were made on hydrography, chemistry, plankton, fish eggs and larvae over the whole of the northern North Sea and Skagerrak. In addition two stations were intensively sampled over 48 hours each and a detailed sampling of fish larvae over Viking Bank was also undertaken. A total of 227 CTD stations were visited on transects between Fedje and Shetland in the north, Knude Dyb (Danish coast) in the south and Gothenburg to Frederikshavn in the east.

Tone Falkenhaus & Richard Nash, expedition leaders.



The survey track (GO Sars 2016106).

Ecosystem cruise is part of the department's monitoring program for hydrography, chemistry, plankton and fish larvae in the North Sea, and usually held in April-May every year. The cruise started 10 years ago as a purely hydrography and plankton surveys in the northern North Sea, but in 2010, expanded to also include the fish larvae. The area covered was also expanded in 2015 to incorporate the Environmental Survey in the Skagerrak/Kattegat area..

The cruise was divided in to three sections with a partial scientific crew exchange on the 19/20th April in Kristiansand and a crew and scientific personnel change on the 27/28th April in Bergen. The only scheduled stations not sampled (due to very poor weather conditions) were the northern stations on the Torungen-Hirtshals section in the Skagerrak. This makes one of the most complete samplings of the northern North sea since the survey was introduced.

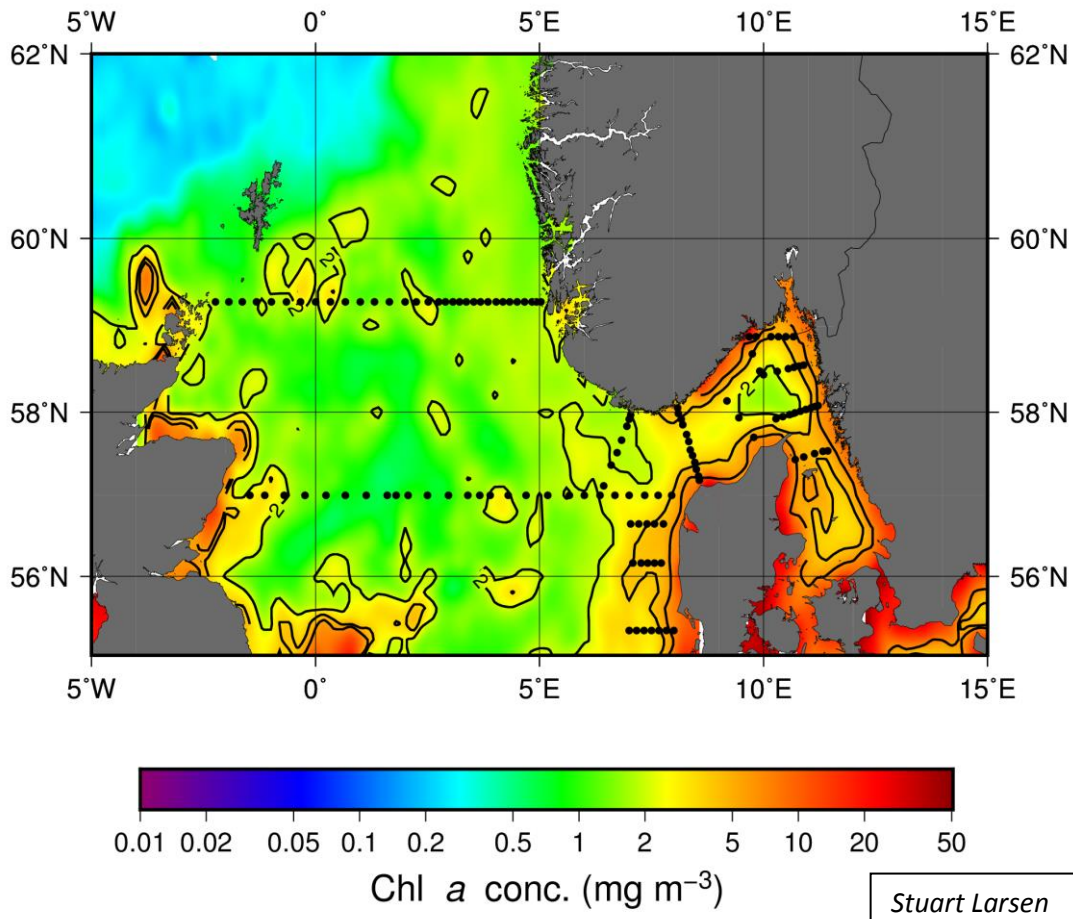
As shown in the first report (see: [Økosystemtokt i Nordsjøen-Skagerrak er i gang](#)) the main sampling equipment were CTD with water bottles, WP 2, WP 3, GULF VII, and MOCNESS. In the third section the sampling completed the standard transects (Fedje-Shetland, Slotterøy and W and Jærens SW and W) and then concentrated on the southern and Shetland 48h stations and the Viking Bank study. Here the sampling mainly utilised acoustics, CTD, WP II, Gulf VII high-speed plankton samplers, 2m Ring net (MIK) and Multinet sampler. The objective was to characterise the 48 h station area relative to the whole survey area (CTD, WP II and Gulf sampling), determine if there were larger larvae/juveniles in the area (MIK sampling) and determine the diel vertical distribution of larvae in the area (Multinet sampling).



Multinet sampler, deployed from the 'hanger' on the G.O. Sars. The multinet has 9, 390 μ m mesh, nets giving the option of sampling 9 depth strata.

There were considerable differences over the northern North Sea with some areas experiencing the spring phytoplankton bloom. These blooms cause problems for net sampling through 'clogging meshes' and making sample sorting very difficult and time consuming. The location of the blooms were followed through regular up-dates of the satellite images. During data analyses it will be possible to overlay all the station data (from hydrography to fish larvae) onto the images (as shown below).

11 Apr – 25 Apr 2016



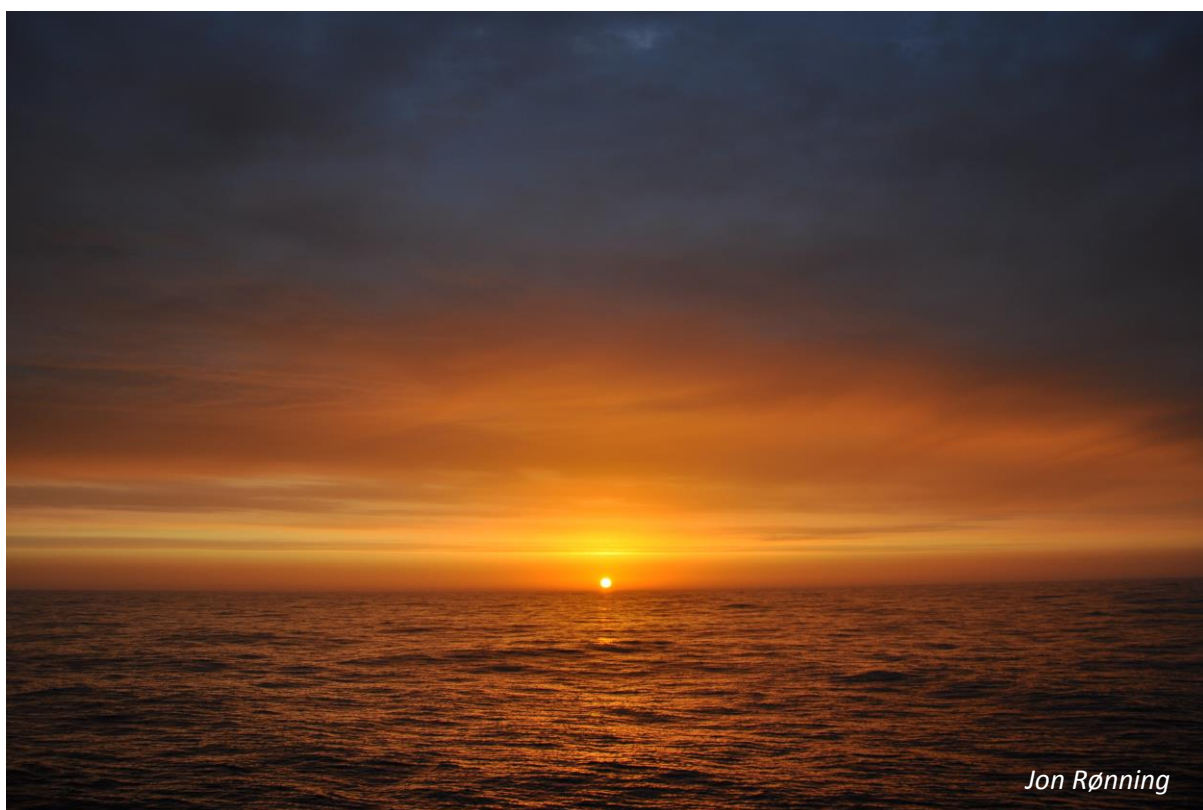
Composite satellite image (11-25th April 2016) of Chlorophyll a. Station locations shown as black dots.

There were fish eggs and larvae in most areas of the northern North Sea. Typically, the densities of eggs and larvae were lowest over the deep water (Norwegian Trench and in to the Skagerrak) with a predominance of gadoid larvae in the north-west (toward the Shetland Islands) and flatfishes in the south and south east (the shallower areas between the Scottish and Danish coasts). Likewise, the zooplankton communities varied considerably over the area due to the physical environment and the where in the seasonal community development cycle each area had reached at the time of sampling.



Examples of fish eggs, flatfish larva and mixed zooplankton from the net hauls.

Everyone worked well together to ensure a successful and productive cruise. Now the analyses can continue ashore. Further details of the cruise and preliminary results will be available in the cruise report.



The end of a day in the May in the northern North Sea.