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FRV *Scotia*

Cruise 1801S

REPORT

6-20 December 2001

Personnel

J Dunn	(In charge)
G Slesser	
N Collie	
M Burns	
C Shaw	
P Simpson	
J Fraser	
M Johnson	University of East Anglia
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Project: AE11n - 15 days

Sampling gear: Hydrographic CTD; Plankton nets (ARIES); Methot nets

Area: Northwestern North Sea-Faroe Shetland Channel, Northern North Sea and Norwegian Trench.

Objectives

1. To conduct routine hydrographic sampling at stations along the standard JONSIS, Fair Isle-Munken and Nolso-Flugga survey lines.

2. To conduct plankton and hydrographic sampling with ARIES in the Faroe Shetland Channel.

3. To conduct plankton and hydrographic sampling with ARIES at stations in the Northern North sea and the Norwegian trench.

Results

The survey was conducted in near perfect weather conditions throughout with only a few hours at the start and on the last day of the cruise being lost.

1. The JONSIS standard section in the northern North Sea was surveyed, and the two standard Faroe Shetland Channel sections were surveyed completely.

2. Plankton and water samples were collected using ARIES and a Methot net in the Faroe Shetland Channel.

3. Plankton and hydrographic samples were collected at selected stations in the Northern North Sea , Norwegian Trench, and central North sea, using ARIES and a Methot net.

4. Measurements of Ammonia concentrations in air and water were conducted by two members of the University of East Anglia during the cruise.

Throughout the cruise surface temperature, salinity and fluorescence recordings were made using a Sea-Bird SBE21 Thermosalinograph and a Sea Tech Fluorometer. Detailed results of the hydrographic data collected during the cruise will be made available as the data is worked up and interpreted by the laboratory.

The Bran and Luebbe auto analyser worked efficiently, during the cruise, and easily kept pace with the number of samples being produced. Problems previously encountered with the system did not materialise, this may in part be due to the extremely good weather, or more likely the new MLA manufactured shipboard mounting system, which helps to keep the instrument stable. A total of 1229 samples were processed for total oxidised nitrogen, silicate and phosphate. Results will be available when the data has been fully worked up by the laboratory.

From each ARIES haul 50, C5 Calanus were picked out. Thirty of there were preserved in liquid nitrogen for lipid analysis, 10 were frozen at -20 for Isotope ratios, and ten were preserved in ethanol for DNA analysis.

At each of the four Methot net hauls 30 of each species of Euphausid in the sample were picked out and treated in a similar way to the Calanus except that the Ethanol preserved samples would be used for genetic analysis.

Measurements of surface sea water and atmospheric concentrations of ammonia were taken over the entire survey in order to calculate the air-sea flux of ammonia .Seawater samples taken from the ship's non-toxic supply, showed good agreement with samples taken from ARIES and CTD samples.

Ammonium/ammonia analysis was conducted using OPA fluorimetry and atmospheric ammonia samples were collected using the filter pack method. High blank values were found in the filter pack analysis, which may in part be due to the high ammonia/methylamines concentration in the fish lab where some of the work was conducted.

Preliminary results show a generally decreasing seawater ammonium concentrations over the cruise period, with slightly higher values nearer the Norwegian coast. Atmospheric ammonia concentrations were found to be generally higher to the South and East of the survey area. Calculated fluxes were generally from sea to air , with some downward fluxes near the Norwegian coast.

Narrative

Scotia sailed from Aberdeen at 1300 hours on Thursday 6th to deep water about two hours distant from Aberdeen and commenced test deployments of the CTD system. When these were successfully completed four tows with the ARIES sampling system were completed to adjust the

ballasting of the sampler, to ensure level towing at operational speeds. .These were successfully completed at 1920 hrs and passage was made to the Eastern end of the Jonsis line in fair weather conditions.

On arrival at the first station of the Jonsis line at 0600 hours the CTD was deployed and there were some difficulties in getting the winch to haul back, this was eventually achieved by manual intervention. The wind had freshened to 50 knots and the sea state to force 8/9 by 0735 hours and in consultation with the master operations were suspended and the ship was battened down to dodge. By 1400 hours it had subsided sufficiently to allow work to commence and sampling continued along the Jonsis line without interruption until 0200 hours on Saturday the 8th.

The Fair Isle -Munken line of stations was commenced at 08.00hrs with a CTD clip and an ARIES tow. The ARIES tow revealed some problems , which included suspect readings from the Seabird Seacat system, a potentially faulty Scanmar, and slightly inaccurate readings from the ships echo sounder. The sampler hit the bottom on this haul, no damage was done, but the net system on the ceased working on hitting the bottom.

The Seabird Seacat system despite many hours of work by MLA engineers on board and ashore, failed to perform correctly and the decision was taken not to deploy it on ARIES until we were confident about its operation.

Work continued with successful deployments of ARIES and the CTD and a Methot net which was deployed off the side deck and towed on the plankton crane.

The Fair Isle-Munken line was completed at 1845 hours on Sunday 9th and the vessel steamed to the end of the Nolso-Flugga line. This was completed including five ARIES and a Methot net without incident by 1045 hours on Tuesday 11th. The vessel set course to work a line of six stations going North and East to a maximum latitude of 62°45.00'N.

Failure to get the Seacat CTD system to work resulted on Wednesday 12th in the Sea-Bird sea logger belonging to the hydro section being removed from the spare CTD frame and made ready for mounting in ARIES, with the addition of the fluorometer and transmissometer from the 911 Sea-Bird CTD system. This allowed more rapid progress with the survey as we did not now have to stop on each station to do a CTD profile dip.

Over the next five days the vessel completed a series of forty ARIES tows and three Methot nets tows in excellent weather conditions down the Norwegian trench.

On Monday the 17th the vessel moved West and North to work a line of eight stations towards the Orkneys. The vessel worked without interruption all through Tuesday the 18th completing a further four stations and had completed two more stations and a Methot net two in the early hours of Wednesday morning when a large swell and gusting wind of 45/50 knots forced the survey to be abandoned at 0530 hours. The vessel then set course for Aberdeen docking at 1530 hours the same day. *Scotia* was unloaded the following morning.

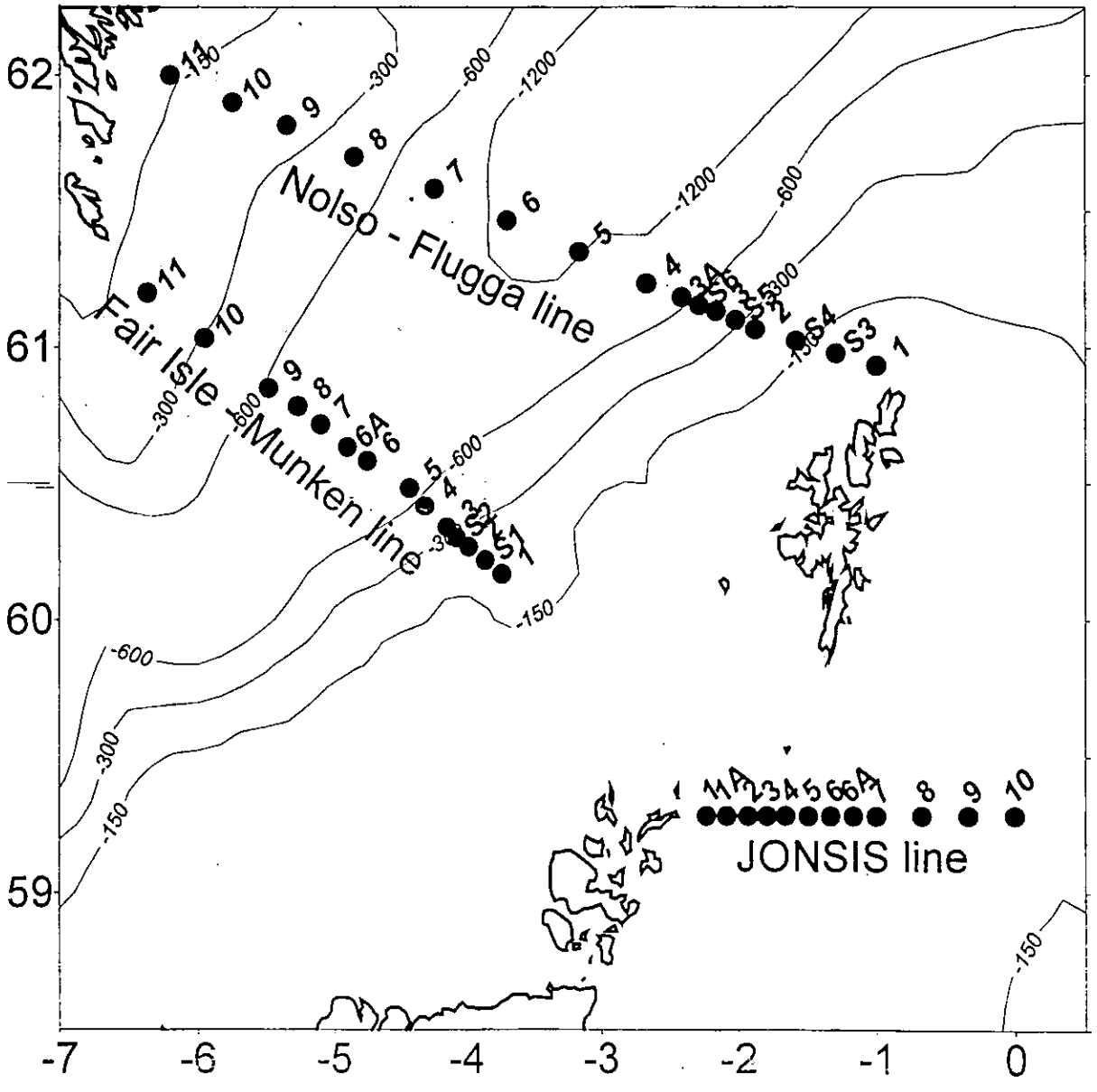
J Dunn
8 January 2002

Seen in draft: R Walton, Master

Figure 1

North Sea and Faroe-Shetland Channel stations,

Scotia 1801 (6/12/01 - 19/12/01)



Scotia 18/2001 North Sea ARIES station grid (6/12/01-19/12/01)