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FRV *Scotia*

Cruise 1704S

PROGRAMME

7-21December 2004

Loading: Aberdeen, 3/4 December 2004
Unloading: Aberdeen, 21 December 2004

***In setting the cruise programme and specific objectives, etc the Scientist-in-Charge needs to be aware of the restrictions on working hours and the need to build in adequate rest days and rest breaks as set out in FRS' Working Time Policy (which is published on the Intranet). In addition, the Scientist-in-Charge must formally review the risk assessments for the cruise with staff on-board before work is commenced.**

Personnel

*J Dunn	(In charge)
S Hay	
J Hunter	
N Collie	
M Rose	
K.Cook	
D Lichtman	
S Robinson	
C Skinner	(Aberdeen University)

Project: AE11r - 15 days

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

Fishing gear: GOV Trawl, BT137, Ground Gear C

Area: Northwestern North Sea-Faroe Shetland Channel, and North Sea (Fladen ground) 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 on the Fladen ground and in the southern Norwegian trench.
4. To conduct fishing operations at selected areas on the Fladen/Viking bank. Norwegian trench areas of the North Sea.

General Procedure

On sailing from Aberdeen the vessel should proceed to the eastern end of the JONSIS line and complete the hydrographic stations in a westerly direction (Table 1, Fig. 1). Hydrographic sampling with the CTD/carousel will then commence on the Fair Isle-Munken line. Towed deployments of the ARIES sampler will be carried out at up to three of the deepest stations along the line (Table 2, Fig. 1).

On completion of the Fair Isle-Munken line the vessel will proceed to conduct hydrographic sampling along the Nolso-Flugga survey line. Towed deployments of the ARIES sampler will be carried out at up to four of the deepest stations along the line (Table 3, Fig. 1).

The vessel will then undertake a hydroacoustic survey of the Fladen ground area during which a grid of stations will be sampled using the Dual MIKT net, and the ARIES plankton sampler. The aim will be to map the distribution and abundance of plankton and fish predators.

On completion of the hydroacoustic survey, the collected data will be scrutinised to select a set of short transects, where fish marks have been identified, these will be surveyed at low speed with towed optical instruments mounted on ARIES, followed by MIKT and GOV trawl hauls to collect fish for examination of stomach contents.

Time permitting, short transects with a GOV trawl may be surveyed in the Norwegian Trench.

Normal contacts will be maintained with the Laboratory.

Scientific Procedures

It is expected that deployments of hydrographic equipment will be carried out with the CTD crane whilst the vessel is on station. Shallow (<1,700 m) deployments of ARIES can be carried out with the Plankton crane.

Three container Laboratories will be required (one wet chemical analysis laboratory, two dry containers for electronics work and communications with sampling equipment). Plankton sample sorting and processing will be carried out in part of the fish laboratory.

Hydrophones for receiving data from the plankton samplers will be installed on the drop keel before the start of the cruise.

All plankton samples will be preserved in formaldehyde solution. It is expected that a proportion of the samples will be sorted fresh, with specimens of *Calanus finmarchicus* being preserved in liquid nitrogen and ethanol. All water samples will be analysed for nutrients aboard the vessel, and all CTD, Optical Plankton Counter and ARIES data will be worked up at sea.

Hydroacoustic data will be recorded from later analysis, though some preliminary analysis will be undertaken at sea.

Subsamples of all fish species captured in the demersal trawls will be measured and counted according to standing instructions. Stomachs will be dissected from at least Norway pout, herring, mackerel and whiting. The contents of each stomach sampled will be roughly classified at sea, and the whole stomach and contents preserved individually in formaldehyde.

J A Morrison
10 November 2004

Table 1

JONSIS line stations

Name	Latitude	Longitude	Depth	Spacing
JO 1	59°17.00'N	02°14.00'W	75 m	
JO 1A	59°17.00'N	02°5.00'W	90 m	8.5 km
JO 2	59°7.00'N	01°56.00'W	100 m	8.5 km
JO 3	59°17.00'N	01°48.00'W	80 m	7.6 km
JO 4	59°17.00'N	01°40.00'W	90 m	7.6 km
JO 5	59°17.00'N	01°30.00'W	95 m	9.5 km
JO 6	59°17.00'N	01°20.00'W	110 m	9.5 km
JO 6A	59°17.00'N	01°10.00'W	120 m	9.5 km
JO 7	59°17.00'N	01°0.00'W	125 m	9.5 km
JO 8	59°17.00'N	00°40.00'W	120 m	18.9 km
JO 9	59°17.00'N	00°20.00'W	140 m	18.9 km
JO10	59°17.00'N	00°0.00'W	135 m	18.9 km

Table 2

Fair Isle - Munken line stations

Name	Latitude	Longitude	Depth	Spacing	
FIM-01	60° 10.00' N	03° 44.00' W	150 m		CTD
SEFOS-1	60° 13.00' N	03° 51.50' W	170 m	8.9 km	CTD
FIM-02	60° 16.00' N	03° 59.00' W	200 m	8.9 km	CTD
SEFOS-2	60° 18.00' N	04° 04.50' W	330 m	6.3 km	CTD, ARIES
FIM-03	60° 20.25' N	04° 09.00' W	390 m	6.3 km	CTD
FIM-04	60° 25.00' N	04° 19.00' W	655 m	12.4 km	CTD
FIM-05	60° 29.00' N	04° 26.00' W	995 m	9.8 km	CTD,ARIES
FIM-06	60° 35.00' N	04° 45.00' W	1090 m	20.6 km	CTD, ARIES, MIKT Priority station for ARIES
FIM-6a	60° 38.00' N	04° 54.00' W	1030 m	9.9 km	CTD
FIM-07	60° 43.00' N	05° 06.00' W	915 m	14.3 km	CTD, ARIES
FIM-08	60° 47.00' N	05° 16.00' W	830 m	11.7 km	CTD
FIM-09	60° 51.00' N	05° 29.00' W	600 m	13.9 km	CTD
FIM-10	61° 02.00' N	05° 57.00' W	280 m	32.4 km	CTD, ARIES
FIM-11	61° 12.00' N	06° 22.00' W	240 m	29.1 km	CTD

Table 3

Nolso - Flugga line stations

Name	Latitude	Longitude	Depth	Spacing	
NOL-11	62° 00.00' N	06° 12.00' W	125 m		CTD
NOL-10	61° 54.00' N	05° 45.00' W	290 m	26.0 km	CTD
NOL-09	61° 49.00' N	05° 21.00' W	180 m	22.9 km	CTD
NOL-08	61° 42.00' N	04° 51.00' W	235 m	29.3 km	CTD, ARIES
NOL-07	61° 35.00' N	04° 15.00' W	990 m	34.2 km	CTD, ARIES
NOL-06	61° 28.00' N	03° 42.00' W	1235 m	31.9 km	CTD, MIKT, ARIES Priority station for ARIES
NOL-05	61° 21.00' N	03° 10.00' W	1370 m	31.2 km	CTD, ARIES Priority station for ARIES
NOL-04	61° 14.00' N	02° 40.00' W	1080 m	29.6 km	CTD, ARIES
NOL-3a	61° 11.00' N	02° 25.00' W	730 m	14.5 km	CTD
SEFOS-6	61° 09.30' N	02° 17.50' W	630 m	7.4 km	CTD
NOL-03	61° 08.00' N	02° 10.00' W	550 m	7.1 km	CTD
SEFOS-5	61° 06.00' N	02° 01.50' W	440 m	8.5 km	CTD, ARIES
NOL-02	61° 04.00' N	01° 53.00' W	270 m	8.5 km	CTD
SEFOS-4	61° 01.40' N	01° 35.40' W	155 m	16.7 km	CTD
SEFOS-3	60° 58.70' N	01° 17.70' W	125 m	16.7 km	CTD, ARIES
NOL-01	60° 56.00' N	01° 00.00' W	110 m	16.7 km	CTD

Figure 1

North Sea and Faroe-Shetland Channel stations,
Scotia 1803 (8/12/03 - 22/12/03)