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FRV *Scotia*

Cruise 0908S

REPORT

Dates: 22-30 July 2008

Project Codes: MF01TA - 9 days

Personnel

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Gear

- 2 x Jackson Rockhopper 184 trawls with titanium floats plus ground gear bags.
- 1 set Morgere ovalfoil 1700 Kg trawl doors.
- Net sensors; deepwater Scanmar trawl door spread sensors (2000 m), Scanmar wing spread sensors(1200 m), Scanmar headline height sensor (1200 m), speed sensor, bottom contact sensor and depth/temperature logger.

FRS Objectives

1. To undertake gear performance and instrumentation trials at 500, 1000, 1500 and 1800 m depths.
2. To undertake bagging trials to assess gear selectivity and sampling bias/catchability.
3. To source new trawl stations at 1500 and 1800 m depths in preparation for September survey.
4. To collect temperature at depth data using a data logger (from all tows).
5. To collect biological, otolith and genetic samples of fish and invertebrates (as required from all tows).

Narrative

Scotia sailed at 07.00 hrs on 22 July. A problem with the radar meant that a technician had to be aboard the vessel for a few hours at sea. Once the problem was resolved the technician was taken into Peterhead by the FRC. Upon retrieving the FRC, a hydraulic pipe on the main crane burst. Due to the inaccessible position of the pipe it was necessary to make a temporary port call at Peterhead to replace the pipe. Scotia resumed sailing at 14.00 hrs and made passage to the western shelf area, arriving on station to begin fishing operations the following day at 15.00 hrs. Gear performance and selectivity trials were undertaken at 500, 1000, 1500, 1650 and 1800 m depths throughout daylight hours. New tows were sourced by sounding the grounds over night and if considered suitable by the fishing master they were trawled the following day. A mechanical problem was detected by the ship's engineers that meant that Scotia would have to go into the dry dock upon return to Aberdeen. To accommodate this Scotia would have to return a day earlier than scheduled. Scotia docked in Aberdeen the early morning of 30 July and was unloaded that day.

Results

A total of 24 hauls were made at 500 m (n = 4), 1000 m (n = 8), 1500 m (n = 8) and at depths between 1650-1800 m (n = 4). All hauls were of 1 hour duration except on 2 occasions when problems were encountered and the gear hauled early. The 1 hour haul duration yielded adequate samples of fish for generating length frequency distributions for the common species. No significant gear damage was incurred. Objectives 1-5 were satisfactorily fulfilled and are summarised as follows;

1. **Gear performance.** Instrumentation data was collected from all hauls, depending on the depth rating of the particular sensors (Table 1). The BT 184 with new 8" floats and Morgere ovalfoil doors performed without any adjustments or complication at 500 m. At depths of 1000 m and more it became clear that in order for the trawl doors to maintain position and spread the gear effectively an extra length of 18 m X 22 mm chain was required between the wire sweep and the twin bridle. The ratio of warp to depth and towing speed needed to get optimal gear performance varied depending upon the trawling depth (Table 2). At depth of 1000 and 1500 m consistent Scanmar readings were obtained for headline, wing and door spread suggesting the new doors give the gear far more stability than has been previously attained when fishing at these depths. Consequently the Morgere ovalfoil trawl doors will be used from now on for the FRS deepwater survey. A haul at 1800 m demonstrated that the gear can fish at 1800 m, although the door sensors suggested the gear was not performing optimally and that further adjustments, specifically the addition of door keels, may be necessary. The gear did however perform adequately well at depths of between1650-1700 m which may represent the effective fishing limit under the current specifications. As no floats imploded at 1800 m (a past problem), the 8" floats will be used from now on for the FRS deepwater survey.

Table 1: Gear performance data collected

Depth	Door spread	Door depth	Wing spread	Headline height	Bottom contact	Temperature and depth
500	YES	YES	YES	YES	YES	YES
1000	YES	YES	YES	YES	YES	YES
1500	YES	YES	NO	YES	YES	YES
1650	Intermittent	YES	NO	NO	YES	YES
1800	NO	YES	NO	NO	YES	YES

Table 2: Warp ratios and vessel speeds for each fishing depth. * 18m x 22mm mid-link chain added to sweep length

Water Depth (m)	Warp Shot (m)	Warp Ratio	Gear Shooting Vessel Speed (knots)	Gear Settling Vessel Speed (knots)	Vessel Towing Speed (knots)
500m	1250	2.5:1	5.8-6.1	1.8-2.2	3.3-3.5
*1000m	2350	2.2:1 +150m	5.8-6.1	1.8-2.2	3.3-3.5
*1500m	3150	2.1:1 +150m	5.8-6.1	1.8-2.2	3.3-3.5
*1650-1700m	3300	2.1:1	5.8-6.1	1.8-2.2	3.3-3.5

2. **Bagging Trials.** The amount of fish being lost under the ground gear was quantified by attaching ground gear bags. Two hauls with ground-gear bags were made at 1000 m depth and for comparison 1 control haul was made without the bags. It was evident that significant quantities of fish being herded into the net were being lost under the ground gear. Furthermore, the catch in the main net was comparable with and without the bags suggesting the net itself was not being affected by the ground gear bag attachments. This suggests that the current rock-hoppers (21") are too large and that a smaller ground-gear should be considered for the survey in the future.

3. **Sourcing of new tows at 1800 m and 1500 m.** Two new areas (ICES squares 44EO and 45EO) were first sounded and trawled at depths between 1650-1800 m (see map). These were clean tows and will serve to complete the coverage of depth strata of the FRS deepwater survey. A new tow was sourced at 1500 m at the northern most limit of the contour (ICES square 47E1). This tow was clean and showed some interesting signs of a changing species composition.

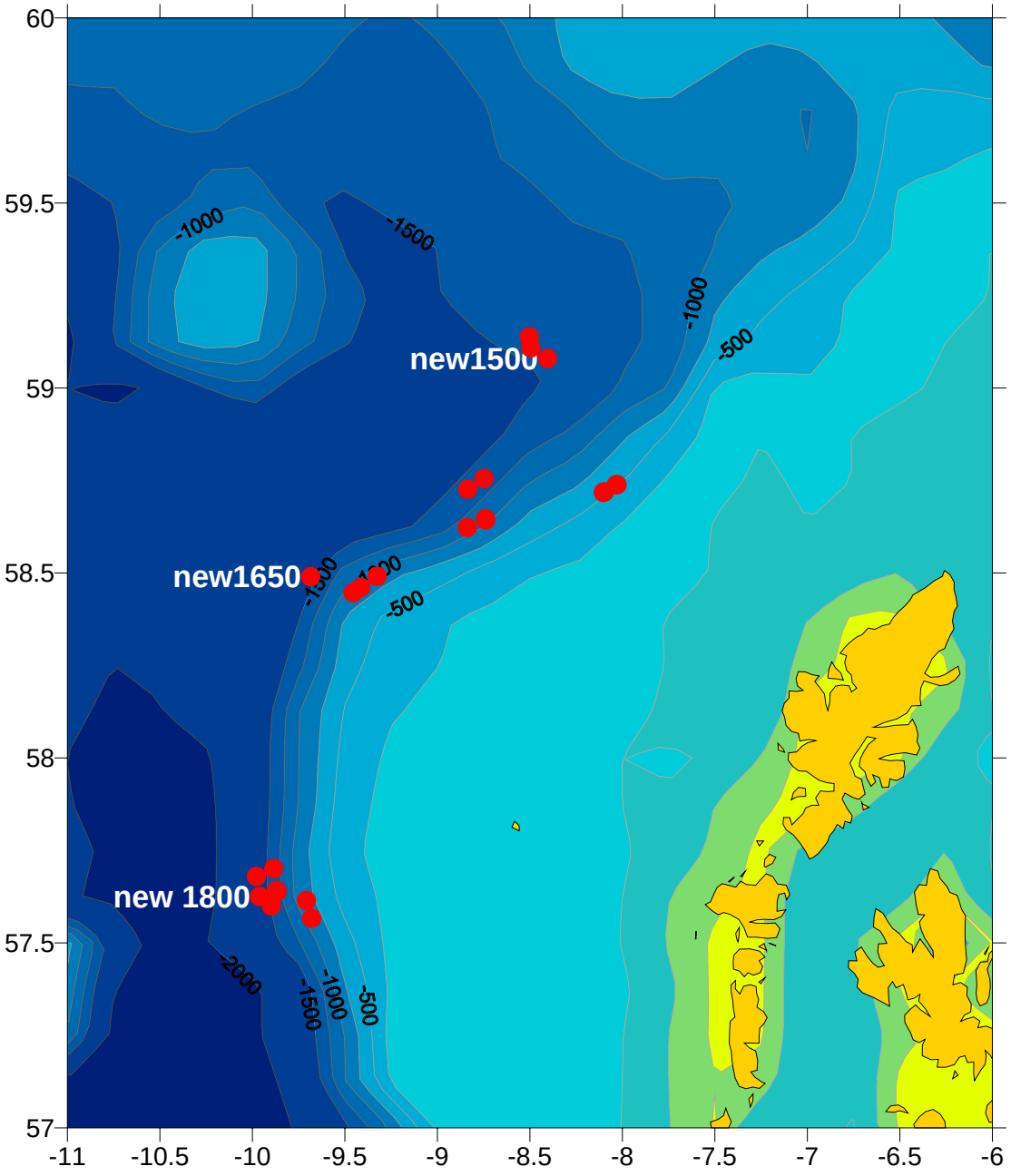
4. **Temperature at depth data.** Successfully deployed and downloaded from all hauls.

5. **Biological data.** The catch was sorted, weighed and measured and additional biological sampling requests of fish and invertebrates were fulfilled (see Table 3). A total of 118 species were identified, including several new to the FRS deepwater survey (*Bathytroctes microlepis, Maulisia microlepis, Phrynichthys wedli, Astronesthes gemmifer* and *Evermanella balbo*).These specimens and other rarities were preserved or frozen or future reference.

Table 3: Additional biological sampling undertaken on cruise 0908S

Species	Otolith	isotope	genetic	Head	Weight/length
Centrselachus crepidator			92	10	
Cenrosymnus coleolepis				7	
Etmopterus princeps				3	
Centrophorus squamosus				9	
Deania calceus				10	
Apristurus aphyodes				10	
Etmopterus spinax				10	
Chimaera monstrosa				10	
Hydrolagus mirabilis				10	
Hydrolagus affinis				4	
Hydrolagus pallidus				6	
Alepocephalus aggassisi					66
Lophius piscatorius					16
Coelorhyncus coelorhynchus					160
Notocanthus chemnitzi					2
Argentina silus	20	20			114
Coryphaenoides guentheri			10		158
Chalinura mediterraneus					177
Nezumia aequalis					117
Alepocephalus bairdii	19	19	15		180
Coelorhyncus labiatus					141
Trachyrhincus murrayi					147
Brosmebrosme	5	5			
Molva diptergygia	19	19			
Cataetyx laticeps	24	24			
Micromestius poutassou	15	15			
Total	**102**	**102**	**117**	**89**	**1278**

Map 1: The area covered during 0908S. Red dots are trawl positions with new tows indicated.



F C Neat
30 July 2008
(seen in draft by Captain R Jowett).