R1/3

Not to be cited without prior reference to the FRS Marine Laboratory, Aberdeen

FRV *Alba-na-Mara*

Cruise 0108A

REPORT

1-17 April 2008

Personnel

C Megginson	1-17 April (Scientist In charge)
P Hayes	1-17 April
C Shand	1-17 April
D Walker	1-8 April
G Graham	1-8 April
F Thompson	8-17 April
P Stainer	8-17 April

Objectives

1. To undertake grab (cores) at Stonehaven sea disposal site (Contingency in the event of winch slipring being unavailable for UTV work to be undertaken).

2. To undertake grab, RoxAnn and Agassiz surveys of the sea disposal site at Whiteness. (Contingency in the event of winch slipring being unavailable for UTV work to be undertaken).

3. To undertake underwater television (UTV), grab and RoxAnn surveys of the sea disposal site at Inverness.

4. To undertake underwater television (UTV) at Gills Bay disposal site prior to use of the site for disposal of sediments from Dounreay.

5. To undertake underwater television (UTV) and RoxAnn surveys of the sea disposal site at Scrabster.

6. To undertake grab, underwater television (UTV) and RoxAnn surveys of unused disposal site south of Crowlin Islands and inspection for the distribution of man-made debris with a view to reusing the site.

7. To undertake grab and underwater television (UTV), Agassiz and RoxAnn surveys of the sea disposal sites at Rothesay, Ayr Bay, Maidens and Stranraer, assess the condition of the seabed, identify the predominant benthic epifauna species, and the distribution of man-made debris.

8. To undertake underwater television (UTV) surveys of sites visited in 2007 at SW Islay and the Sound of Eigg (Contingency).

9. Sediment samples for Objectives 1, 2, 6, and 7 will be analysed for chemical and physical parameters.

Out-turn days per project: AE02n (10108) – 17 days

Narrative

Alba-na-Mara departed from Fraserburgh Harbour on the 1 April at 1300 and passage was made to Aberdeen Bay anchorage. The following morning passage was made to the Stonehaven sea disposal site where thirteen grab sample stations were successfully completed along with a RoxAnn transect of the entire disposal site and three underwater TV, (UTV) transects. Anchorage was made in Stonehaven Bay in preparation for the transfer of staff and equipment from and to the *Temora* early on 3 April. Work proceeded during the day around Stonehaven Bay, collecting Day grab and core samples from various locations when it was noticed that the RoxAnn system was faulty. Staff and equipment were transferred back to and from the *Temora* at 18:30. Attempts were made during the day to fix the RoxAnn without success so it was decided to return to Aberdeen in the evening for expert assistance. RoxAnn was fixed during the evening. The Skipper and Scientist in Charge decided that, due to the forecast of bad weather, coming in from the north, it would be in the best interest of maintaining an operating ship, to dodge the weather and head south where surveys on disposal sites in the Firth of Forth could be conducted. *Alba-na-Mara* departed from Aberdeen Harbour at 10:00 on 4 April and made passage for Stonehaven, where the RoxAnn system was calibrated, before making passage to Pittenweem, anchoring in St. Andrews Bay overnight. On arrival at the Pittenweem sea disposal site on 5 April, eleven grab sample stations were successfully completed along with a RoxAnn transect of the entire disposal site. The increasing tide precluded deployment of the UTV so passage was made to the Methil sea disposal site where a RoxAnn transect of the entire site was undertaken prior to anchoring in Largo Bay for the night (3 nm from Methil sea disposal site). On 6 April, five UTV transects were made and twelve grab sample stations successfully completed at the Methil site before passage was made to the Kirkcaldy sea disposal site. A RoxAnn transect of the entire Kirkcaldy sea disposal site and two UTV transects were made before anchoring at the small boats anchorage at Kirkcaldy. The following morning further attempts were made at UTV transects but underwater conditions were too cloudy. It was therefore decided to try again later in the day during slack water. Thirteen grab sample stations were successfully completed at the Kirkcaldy sea disposal site and then passage was made across the Firth to the Narrow Deeps to conduct a RoxAnn transect of the entire sea disposal site. Following this, passage was made back to Kirkcaldy where UTV survey work was successfully completed, before passage was made east to Pittenweem to complete the survey of the disposal site there. Initial deployment of the UTV proved unsuccessful due to unfavourable tidal currents, but after one hour, four successful UTV transects were completed. Passage was then made to Fraserburgh, arriving at 0800 on 8 April, for the exchange of scientific staff and to take on water. The 8 April was also taken as a rest day. *Alba-na-Mara* departed from Fraserburgh Harbour on the 9 April at 0600 and passage was made to Scrabster sea disposal site, where five UTV transects were successfully completed before anchoring in Dunnet Bay for the night (3 nm from Scrabster disposal site). The following day eight grab sample stations were successfully completed along with a RoxAnn transect of the entire disposal site, before making passage to the Crowlin Islands on the west coast, anchoring en-route during the early hours of 11 April at Longa. Work began on surveying the Crowlin Islands sea disposal site at 1020, when a RoxAnn transect was undertaken, followed by twelve successful sample grab stations. The water depth at this disposal site was too great for UTV transects (having only ca. 170 m of cable onboard). Due to problems

with saving the previous run, the RoxAnn transect of the disposal site was repeated and this time successfully saved. After completion of the Crowlin Islands survey, passage was made to the port of Kyle to take on water prior to making overnight passage to the Maidens sea disposal site south of Ayr where a successful RoxAnn transect was undertaken of the entire site. On completion of the RoxAnn transect, anchorage was made in Culzean Bay, (3 nm east of Maidens). The following morning surveys of Maidens continued, with thirteen sample grab stations successfully completed along with three UTV transects and two Agassiz trawls across the disposal site. In the afternoon a short passage to the Ayr Bay sea disposal site was made where a RoxAnn transect was made of the entire disposal site followed by three successful UTV transects. Anchorage was made, once again, at Culzean Bay, (8 nm from Ayr Bay). On 14 April survey work continued on the Ayr Bay site and thirteen grab sample stations were successfully completed before making passage west to Campbeltown. On arrival at the Campbeltown sea disposal site, twelve grab sample stations were successfully completed along with two UTV transects, before undertaking the passage back to Fraserburgh. *Alba-na-Mara* arrived back at Fraserburgh Harbour at 1900 on 16 April.

Results

The cruise achieved many of its objectives, although alternative survey sites were added as the cruise progressed due to the need, at short notice, to proceed initially to Stonehaven and then to the Firth of Forth because of impending bad weather. These changes to the programme meant that some of the initial objectives were removed and new objectives added. In spite of these changes, the cruise was very successful and the additional work undertaken by scientific staff, joining the cruise at Stonehaven, was successfully completed.

1. At Stonehaven sea disposal site thirteen grab samples were recovered from thirteen stations and some will be analysed for polycyclic aromatic hydrocarbons (PAHs), heavy metals (HM), tributyl tin (TBT), partical size (PSA) and total organic carbon (TOC). Three UTV transects across the disposal site showed no evidence of manmade debris. An initial RoxAnn transect was unsuccessful due to a fault with the system, but after repair the site was revisited, the RoxAnn calibrated and a successful transect obtained. Grab samples were successfully recovered from additional stations on the second day of the cruise, using the Day grab and corer, as part of a PhD project.

2, 3 and 4 were not undertaken due to adverse weather conditions resulting in *Alba-na-Mara* heading south to the Firth of Forth after completing the survey of the Stonehaven sea disposal site and Stonehaven Bay (expected high winds prevented the ship from sailing in a northerly direction). Alternative objectives were created to enable work to be conducted in the Firth of Forth until the weather improved for passage north:

i. At Pittenweem sea disposal site eleven grab samples were recovered from thirteen stations for chemical analyses as stated in objective 1 above. An initial UTV transect was aborted due to high tidal currents, however, four successful UTV transects were completed when the site was revisited two days later. Eleven grab samples were recovered from thirteen stations for chemical analyses as stated in objective 1 above and a RoxAnn transect of the site was successfully completed.

ii. At Methil sea disposal site twelve grab samples were recovered from thirteen stations for chemical analyses as stated in objective 1 above. Five UTV transects across the disposal site showed some evidence of manmade debris (eg. wires, cables, cans) and a RoxAnn transect of the disposal site was successfully completed.

iii. At Narrow Deeps a RoxAnn transect of the sea disposal site was successfully completed for comparison with the RoxAnn transect made over the same area in 2007 with the *Clupea*.

iv. At Kirkcaldy sea disposal site grab samples were recovered from all thirteen stations for chemical analyses as stated in objective 1 above. Two UTV transects across the disposal site were completed before anchoring for the night and a further UTV transect was completed the following afternoon. None showed any evidence of manmade debris. A RoxAnn transect of the disposal site was also successfully completed.

5. The survey of Scrabster sea disposal site produced eight successful grab samples from thirteen stations for chemical analyses as stated in objective 1 above. Five UTV transects across the disposal site showed some evidence of manmade debris (eg. wires) and a RoxAnn transect of the disposal site was successfully completed.

6. At Crowlin Islands sea disposal site twelve grab samples were recovered from thirteen stations for chemical analyses as stated in objective 1 above, plus analysis for chlorobiphenyls (CBs). The initial RoxAnn transect failed to save so a second RoxAnn transect was undertaken and successfully completed. No UTV was achieved due to the water depth (>170m) being greater than the amount of TV cable on board.

7. Due to the additional time spent surveying sea disposal sites on the east coast it was decided that both Rothesay and Stranraer would not be surveyed during the cruise.

i. At Ayr Bay sea disposal site grab samples were recovered from all thirteen stations for chemical analyses as stated in objective 1 above. Three UTV transects across the disposal site showed evidence of manmade debris (e.g. litter and wires) and large amounts of wooden debris. A RoxAnn transect of the disposal site was successfully completed.

ii. At Maidens sea disposal site grab samples were recovered from all thirteen stations for chemical analyses as stated in objective 1 above, plus analysis for CBs. Three UTV transects across the disposal site showed no evidence of manmade debris, although there was evidence that trawling had recently occurred over the site. A RoxAnn transect of the disposal site was successfully completed.

8. The greater depths and tidal conditions at these sites meant that UTV planned for SW Islay and the Sound of Eigg were not undertaken. As a consequence, time was available to undertake a survey at the Campbeltown sea disposal site where twelve successful grab samples from thirteen stations were obtained for chemical analyses as stated in objective 1 above. Two UTV transects across the disposal site showed some evidence of manmade debris (e.g. wires).

All data collected from the sea disposal sites will be used to assess the continuing use of the sites and provide new information for the Crowlin Islands and Maidens sites which have not been used for a number of years.

The crew, and in particular the Skipper, provided excellent support throughout the cruise and good communication was maintained between the Skipper and Scientist in Charge on a daily basis. There was a good working environment and good cooperation between the crew and scientists which meant that the new (amended) objectives were completed successfully and with the full cooperation of all involved.

Colin Megginson
25 August 2008