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RV Sir John Murray

Survey 0114SJM

REPORT

10-18 Nov 2014

Ports

Loading: Troon, 6 November 2014

Unloading: Troon, 18 November 2014

Personnel

C Robinson SIC

K MacNeish

F Gunn-Folmer

Gear

Bottom trawl, 1.5 m beam trawl (SEPA provided); catamaran manta trawl and neuston net

Objectives

1. To undertake flatfish and sediment sampling in the Clyde and Solway in support of the Clean Seas Environment Monitoring Programme (OSPAR and MSFD).
2. To undertake sample preparation for subsequent ecotoxicological analyses.
3. To undertake survey of sea-surface litter in the Firth of Clyde and Solway Firth.
4. To take adventitious samples of fish and shellfish for microplastics

Out-turn Days per Project: 5 days ST03n/3 days ST014

Narrative

Scientific equipment was loaded onto *Sir John Murray* on 6 November, ahead of the survey. Scientific staff joined the ship on 10 November and sailed from Troon at 11:30 hours to collect five sediment grabs from the Firth of Clyde, Middle Offshore water body, which included the former sewage sludge disposal site at Garroch Head. The catamaran manta net was trialled in Largs Channel until crew and scientists were happy they could work it and the catamaran was deployed to sample floating debris from Cloch Point towards Greenock. The vessel was berthed in James Watt dock at 19:30 hours that evening. *Sir John Murray* departed Greenock at 07:30 hours on 11 November and proceeded to fish the Bowling site, where five beam trawls returned the required 50 flounder. The catamaran trawl was deployed to sample floating debris in the Clyde estuary, with three tows undertaken between Dumbarton and Erskine Bridge with three more tows undertaken between Dumbarton and Greenock. The vessel returned to Greenock where she berthed at 15:30 hours and all collected fish were worked-up. The vessel left James Watt dock at 07:30 hours the following morning and the catamaran trawl was towed as the vessel headed towards Cloch Point and then to the Holy Loch fishing site. Four bottom trawls were undertaken in order to obtain the

50 required dab, after which two catamaran tows were undertaken in Loch Long, before the vessel returned to Greenock and berthed at 19:00 hours. *Sir John Murray* sailed from Greenock at 07:30 hours on 13 November and undertook two catamaran sea surface tows in the Firth of Clyde between Cloch Point/Dunoon and Skelmorlie/Toward Point; a third tow was abandoned due to the sea state. Two catamaran tows were undertaken in the more sheltered waters of Loch Striven before the vessel moved in strengthening winds to collect the sediment grabs from Hunterston Channel. Poor weather prevented any fishing or further catamaran tows and the ship berthed in Troon at 16:45 hours. Poor weather on 14 November prevented any work being undertaken. The vessel sailed from Troon at 07:30 hours on 15 November and fished the Hunterston and Garroch Head sites. One tow returned sufficient plaice at Hunterston, although two tows at Garroch Head returned only 18 plaice. Time and weather constraints then necessitated the vessel making for the Solway, with one catamaran manta net tow being undertaken in the Middle Offshore water body en route. From first light on 16 November, the five Balcary Point sediment samples were collected and the Solway fishing site trawled. With a strong northerly wind forecast, the vessel then made passage back overnight to the Firth of Clyde, undertaking four manta net tows in the Solway en route and arriving back in Troon at 02:00 hours. On 17 November, the opportunity was taken to undertake five further manta net tows in Irvine Bay, Ayr Bay and the Firth of Clyde Middle Offshore water body. *Sir John Murray* berthed in Troon at 15:30 hours to complete the survey.

Acknowledgements

The scientific staff would like to express their thanks to SEPA and the skipper and crew of the *Sir John Murray* for all their assistance and companionship throughout the survey.

Results

A summary of the results is given in Table 1.

Seen in draft: *H. Anderson* (OIC *Sir John Murray*)

Submitted:
C Robinson
20 November 2014

Approved:
I Gibb
3 December 2014

Table 1

Samples collected during cruise 0114SJM for chemical, eco-toxicological and disease analyses.

Site:	Bowling	Holy Loch	Hunterston	Garroch Head	Solway	TOTAL
Species:	Flounder	Dab	Plaice	Plaice	Dab	
Biological Effects						
External Disease	50	50			40	140
Micronucleus	25	25		18	25	93
Bile	25	25		18	25	93
Liver histopathology	50	50			40	140
Gonad histopathology	-	15			8	23
EROD	15	15		15	15	60
Lysosomal stability	25	25			20	70
Otoliths	50	50			40	140
Liver Chemistry						
PCBs / PBDEs	5 ⁽¹⁾	5 ⁽¹⁾	4 ⁽²⁾	4 ⁽³⁾	5 ⁽¹⁾	24
Metals	5 ⁽¹⁾	5 ⁽¹⁾		4 ⁽³⁾	5 ⁽¹⁾	20
Muscle Chemistry						
Metals	5 ⁽¹⁾	5 ⁽¹⁾		4 ⁽³⁾	5 ⁽¹⁾	20
Benthic Litter						
Hauls examined	5	4	1	2	1	
Sediments						
PAHs			5	5	5	15
PCBs/PBDEs			5	5	5	15
Metals			5	5	5	15
CHN/Particle Size			5	5	5	15

⁽¹⁾ 5 pools of 5 tissues; ⁽²⁾ 4 pools of 5 tissues; ⁽³⁾ 2 pools of 5 and 3 pools of 4

Table 2

Catamaran manta trawls undertaken during cruise 0114SJM for floating litter.

Region	Area	No.	Duration
Clyde	Estuary (Greenock – Erskine Bridge)	6	30 mins
Clyde	Inner Firth (Cloch Point - Greenock)	2	30-45 mins
Clyde	Loch Long	2	60 mins
Clyde	Inner Firth (Dunoon-Skelmorlie)	2	60 mins
Clyde	Loch Striven	2	60 mins
Clyde	Middle Offshore	4	60 mins
Clyde	Irvine Bay	1	60 mins
Clyde	Ayr Bay	1	60 mins
Solway	Luce Bay	1	90 mins
Solway	Wigton Bay	2	60 mins
Solway	Balcary Point	1	60 mins