

# **CRUISE REPORT: WEST COAST OF SCOTLAND “JEFFERYS” CRUISE**

**13<sup>th</sup> June – 21<sup>st</sup> June 2008**

**RV Prince Madog Cruise**

**Cruise Number: 18/08**

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## **ABSTRACT**

This report details a scientific research cruise undertaken in the Scottish Lochs and Northern Irish Sea in June 2008. The principle aims of the cruise were to collect a range of invertebrate organisms, particularly polychaete worms and bivalve molluscs (*Arctica islandica* and *Glossus humanus*), from a range of suitable areas. Many of the locations selected were believed to be those sampled by Jeffrey's on a cruise in the 19<sup>th</sup> Century. Invertebrates were collected for taxonomic and phylogenetic study.

The organisms were collected for study using a range of equipment including grabs, an anchor dredge and a bespoke *Arctica* dredge and 2m beam trawl. Areas to be dredged will be surveyed initially using side scan sonar to identify possible sea bottom obstructions.

In total 25 stations were identified for sampling. These included stations in the Irish Sea, the Clyde Sea, Irvine Bay, Loch Fyne and stations of the isle Arran and the Campbeltown Peninsula.

## **PERSONNEL**

1. Professor Chris Richardson (PSO) (SOS)
2. Dr Iain Ridgway (SOS)
3. Dr Alan Wanamaker (SOS)
4. Paul Butler (SOS)
5. David Reynolds (SOS)
6. Dr Ivor Rees (SOS retired staff)
7. Dr Graham Oliver (National Museum of Wales)
8. Dr Andy Mackie (National Museum of Wales)
9. Anne Hammerstein (SOS)
10. Anna Holmes (National Museum of Wales)
11. Kate Mortimer (National Museum of Wales)
12. Nick Jones (SOS)
13. Professor John Taylor (Natural History Museum, London)

## SCHEDULE

- 13<sup>th</sup> June:** Cruise begins at Menai Bridge, staff embark  
10:30 Depart  
11:45 Arrive at Red Wharf Bay (RWB)  
12:00 – 13:00 Sampling at RWB, 3 x Van Veen grabs, 1 x Tjärner dredge and 1 x beam trawl.  
Transit to Station 1, Irish Sea.  
18:30 Arrive at Station 1  
18:30 – 21:30 Sampling at station 1. 7 x Van Veen grabs, 3 x Tjärner dredge.  
Transit to Station 2, Irish Sea.  
22:00 Arrive Station 2.  
22:00 – 23:00 Sampling at station 2. 2 x water bottle samples, 4 x Van Veen grabs, 1 x Tjärner dredge.  
Overnight transit to Station 5, Clyde Sea.
- 14<sup>th</sup> June:** 12:52 Arrive at Station 5, Clyde Sea.  
13:51 – 12:52 Deployment of sidescan sonar  
14:15 – 15:00 Sampling station 5, 3 x Epibenthic dredges deployed, 1 off bottom.  
15:20-15:31 Sampling station 5, 1 Arctica dredge  
15:51 – 16:02 Sampling at Station 5, 2 x Van veen grabs.  
16:22 – 16:40 Sampling at Station 5, 1 x 2m Beam Trawl.  
17:01 Water samples collected at Station 5.  
Overnight transit to Station 7 Irvine Bay.
- 15<sup>th</sup> June:** 07:20 Arrive at Station 7 Irvine Bay  
07:22 – 07:58 Deployment of sidescan sonar  
08:10 – 08:52 Sampling station 7, 3 x Arctica Dredges.  
09:03 – 09:12 Deploy large Tjärner Dredge.  
09:25 – 09:35 Deploy 1 x epibenthic sledge.  
09:35 – 10:05 Transit to Station 6 Irvine Bay.  
10:06 – 10:12 Sampling Station 6, 2 x Van Veen Grabs  
10:28 – 10:40 1 x Epibenthic Sledge  
10:50 Water sample taken at Station 6.  
10:50 – 10:52 Transit to Station 9.  
10:52 – 12:36 Deployment of sidescan sonar.  
12:56 – 14:11 Sampling station 9, 3 x Arctica Dredges.  
14:22 Water sample taken at Station 9.  
14:25 – 15:15 Transit to Station 10. Main channel Isle of Cumbrae.

**15<sup>th</sup> June** 15:15 – 16:01 Deployment of sidescan sonar at Station 10.  
16:30 – 17:20 Sampling station 10, 2 x Arctica Dredges.  
17:50 LCD deployed  
18:00 Water sample taken.  
Overnight transit to Station 11.

**16<sup>th</sup> June** 07:12 – 07:23 Deployment of sidescan sonar at Station 11.  
07:25 – 08:00 Sampling station 11, 2 x Arctica Dredges.  
08:10 Water sample taken.  
08:10 – 09:00 Transit to station 11A  
09:05 – 09:25 Sampling at station 11A, 2 x 2m Beam Trawls.  
09:25 – 10:25 Transit to Whiting Bay (extra station)  
10:25 – 11:30 Sampling Whiting Bay, 4 x large Tjärner Dredge.  
11:30 – 13:15 Transit to Station 12, Lower Loch Fyne  
13:16 – 13:24 Sampling at Station 12, 2 x Van Veen Grabs  
13:44 – 14:15 Deployment of Agazis Dredge.  
14:42 Water Sampling at Station 12.  
15:12 – 15:24 Sampling at station 12, 2 x Van Veen Grabs  
15:53 – 16:28 Deployment of Agazis Dredge.  
16:53 – 17:14 3 x Van Veen Grabs  
Overnight Transit to Station 15, Loch Gilphead.

**17<sup>th</sup> June** 07:43 – 08:17 Deployment of sidescan sonar at Station 15.  
08:17 – 08:59 Sampling station 15, 2 x Arctica Dredges.  
Transit to Station 12A  
09:32 – 09:38 Sampling at station 12A, Deployment of Epibenthic sledge.  
Transit to Station 13  
11:31 – 13:36 Sampling at Station 13, 8 x Van Veen Grabs  
13:53 – 13:58 Sampling at Station 13, Deployment of Epibenthic sledge.  
14:06 Water sample taken  
Transit to Station 14.  
15:29 – 16:48 Sampling at Station 14, 2 x Van Veen Grab Sample  
15:40 Water sample taken.  
Overnight transit to Station 16.

**18<sup>th</sup> June** 08:08 – 08:50 Deployment of sidescan sonar  
09:20 – 10:30 Sampling at Station 16, 4 x Arctica Dredge  
10:30 – 11:30 Sampling at Station 16, 7 x Van Veen Grabs  
11:45 – 12:00 Sampling at Station 16, 1 x 3m Beam Trawl  
13:25 – 14:20 Sampling at Station 16, 8 x Van Veen Grabs

14:22 Water sample taken  
 Transit to Campbeltown

**19th June** 13:00 – 13:30 Sampling at Campbletown Loch, 3 x Van Veen Grabs

**20th June** 10:37 – 11:07 Sampling at Station 12, 3 x Van Veen Grabs + temperature Logger deployed.  
 11:27 – 11:47 Sampling at Station 12, 2 x Epibenthic Sledge  
 Transit to Station 13  
 13:43 – 14:04 Deployment of sidescan sonar  
 14:46 – 14:54 Sampling at Station 13, 1 x Arctica Dredge.  
 15:19 – 17:29 Sampling at Station 13, 16 x Van Veen Grabs  
 17:43 Temperature Logger Deployed  
 18:00 – 18:06 Sampling at Station 13, 1 x epibenthic sledge  
 Overnight Transit to Lamont Shelf

**21st June** 08:32 – 08:48 Deployment of sidescan sonar  
 08:57 – 09:03 Sampling at Lamont Shelf, 1 x Arctica dredge.  
 09:23 – 09:27 Sampling at Lamont Shelf, 2 x Van Veen Grabs  
 Transit to Inchmarnock Water  
 09:52 – 10:08 Sampling at Inchmarnock Water, 1 x Agazis dredge  
 Transit to Station 5  
 12:24 – 12:37 Sampling at Station 5, 1 x beam Trawl  
 12:55 Temperature Logger Deployed

**OBJECTIVE:**

The objective of the cruise was to collect a range of invertebrate organisms, particularly polychaete worms and bivalve molluscs (*Arctica islandica* and *Glossus humanus*), from a range of suitable areas. The organisms will be collected for study using a range of equipment including grabs, an anchor dredge and a bespoke Arctica dredge and 2m beam trawl. Areas to be dredged will be surveyed initially using side scan sonar to identify possible sea bottom obstructions.

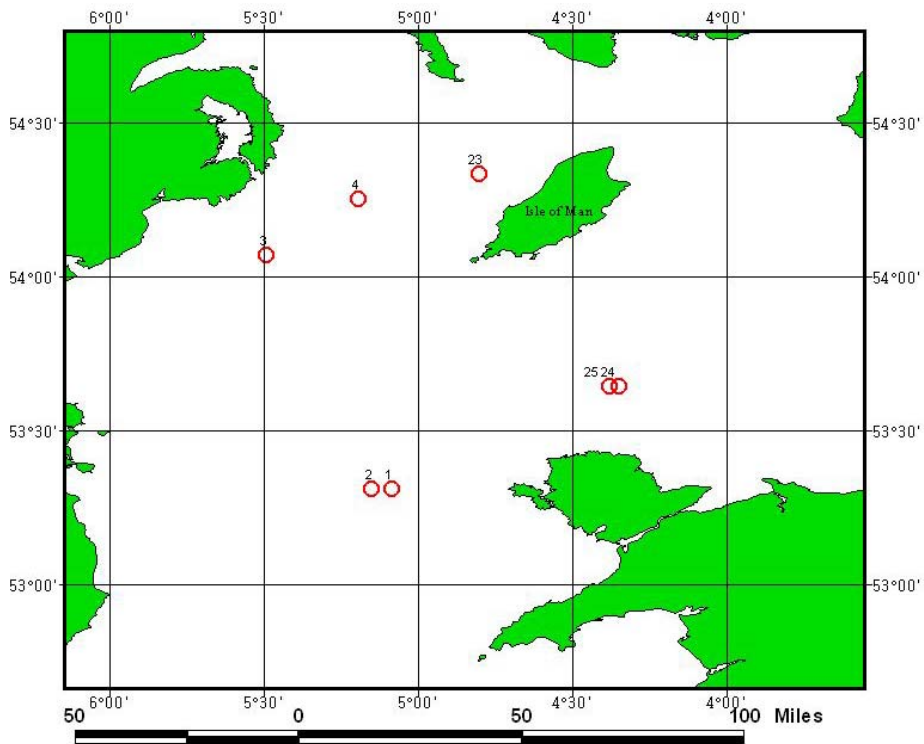
## STATIONS

Table 1 includes a list of all stations visited during the cruise and the gear deployed at each location. The geographical location of each station is depicted in Figures 1 – 3. Although stations 17 – 23 were identified in the cruise plan, they were not visited during the cruise.

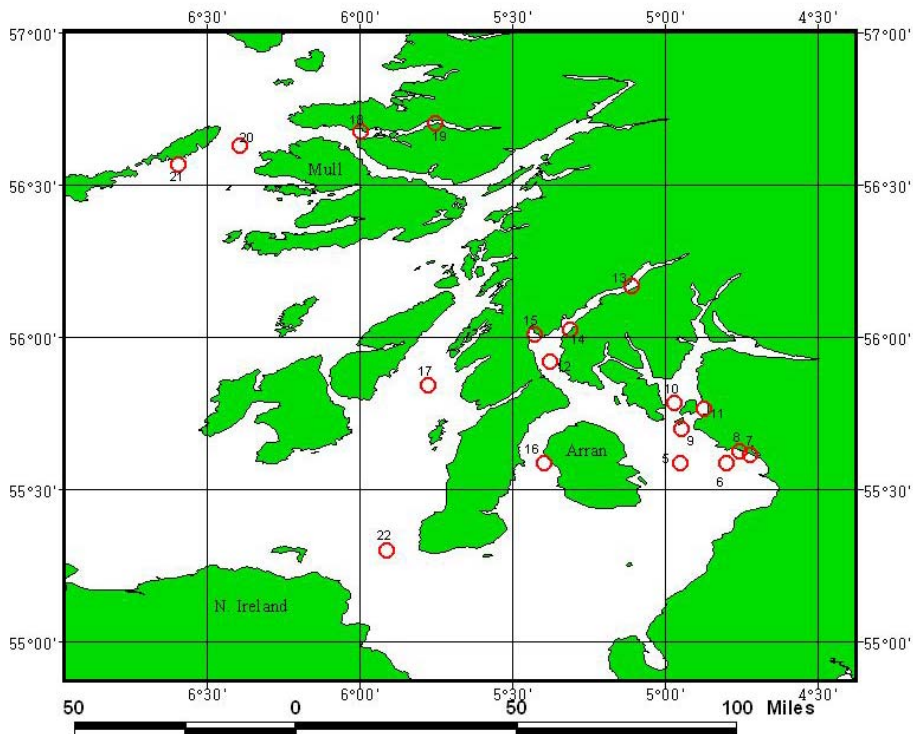
*Table 1: Station positions and the gear deployed at each location (for the coordinates of individual gear deployments please contact the CSO)*

Site	Location	Latitude	Longitude	Depth (m)	Gear deployed
1A	Red Wharf Bay	53°19.500'N	4°09.030'W	10	3 x Van Veen grabs 1 x Tjärner dredge 1 x beam trawl
1	West of Anglesey	53°18.470'N	5°05.430'W	171	7 x Van Veen grabs 3 x Tjärner dredge
2	West of Anglesey	53°18.590'N	5°09.530'W	120	2 x water bottle samples 4 x Van Veen grabs 1 x Tjärner dredge
5	East of Brodick, Arran	55°35.181'N	4°57.326'W	108	3 x epibenthic dredges 1 x Arctica dredge 2 x Van Veen grabs 1 x 2m beam trawl 1 x water samples 1 x beam trawl 1 x temperature logger
6	Irvine Bay	55°35.15'N	4°48.25'W	52	2 x Van Veen grabs 1 x Epibenthic sledge 1 x water sample
7	Irvine Bay	55° 36.683N	4° 43.714'W	10-12	3 x Arctica dredges 1 x large Tjärner dredge 1 x epibenthic sledge
9	South Wee Cumbrae	55° 41.778'N to 55° 39.178'N	4° 57.101'W 4° 55.659'W	60-70	3 x Arctica dredges 1 x water sample
10	Main Channel between Cumbrae & Bute	55° 46.857'N to 55° 48.807'N	4° 58.515'W 4° 52.846W Steering 001* T	60-70	2 x Arctica dredges 1 x LCD deployed 1 x water sample taken
11	Fairlie Channel	55° 45.808N	4° 52.846W	40-50	2 x Arctica dredges

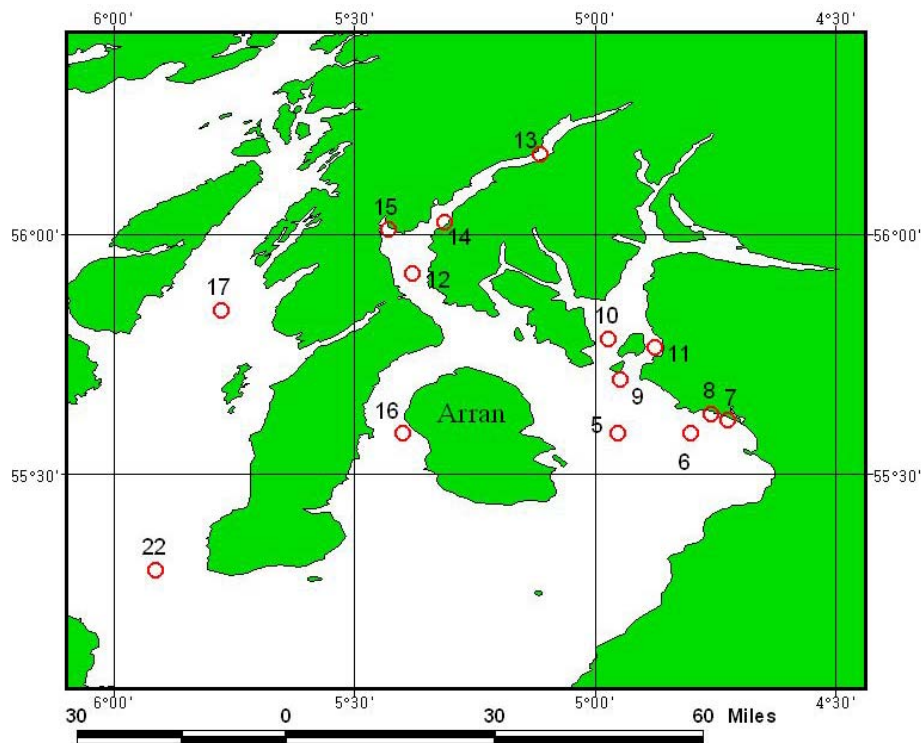
	between Cumbrae & Fairlie	to 55° 45.214N	4° 53.213W Steering 018*T		1 x water sample
11A		55°47.900'N	4°55.00'W	30	2 x 2m beam trawls.
	Whiting Bay	55°44.300'N	5°05.300'W	45	4 x large Tjärner dredge
12	Lower Loch Fyne	~55°55'N	~5°27'W	140+	10 x Van Veen Grabs 2 x Agazis dredge. 1 x water sample 1 x temperature logger 2 x epibenthic sledge
12A		55°57.800'N	5°22.900'W	130	1 x epibenthic sledge
	Campbletown Loch	55°25.300'N	5°35.250'W	18	3 x Van Veen grabs
13	Upper Loch Fyne	56°10'N	5°5'W	20	24 x Van Veen grabs 2 x epibenthic sledge 1 x water sample 1 x Arctica dredge 1 x temperature logger
	Lamont Shelf	55°49.140'N	5°12.600'W	31	1 x Arctica dredge. 2 x Van Veen grabs
	Inchmarnock Water	55°47.200'N	5°11.900'W	75	1 x Agazis dredge
14	Exploration north of the narrows	56°1.5'N	5°19'W	61	2 x Van Veen grabs 1 x Water sample taken
15	Head of Lower Loch Fyne	56°0.5'N	5°26'W	25	2 x Arctica dredges
16	Kilbrannan Sound	55°35.174'N	5°24.190'W	60	4 x Arctica dredge 15 x Van Veen grabs 1 x 3m beam trawl 1 x water sample



**Figure 1:** Location of stations identified in the Southern Irish Sea.



**Figure 2:** Location of stations identified in the Scottish Lochs and Clyde Sea Area.



**Figure 3:** Location of stations identified in the Scottish Lochs and Clyde Sea Area.

Table 2 lists the number of live (damaged and undamaged) *A. islandica* and shells from dead *A. islandica* collected during each gear deployment at all the stations.

The coordinates of all gear deployments and recoveries at all the stations visited during the cruise are detailed in Appendix 1.



**Table 2:** The number of *Arctica* (and other species) captured in the gear deployments at each station.

Station	No.	Gear	Live <i>Arctica</i> Undamaged	Live <i>Arctica</i> Damaged	Dead
1	1	Grab	0	0	4
5	1	Arctica Dredge	0	0	13 (9 Glossus, 4 Arctica)
8	1	Arctica Dredge	7	9	0
8	2	Arctica Dredge	7	7	1
8	3	Arctica Dredge	12	14	0
8	4	Epibenthic Sledge	20 (all small juveniles)	0	10 (Including 4 Glossus)
9	1	Arctica Dredge	0	2	0
9	2	Arctica Dredge	0	0	0
9	3	Arctica Dredge	0	0	0
10	1	Arctica Dredge	0	1	0
10	2	Arctica Dredge	0	0	0
11	1	Arctica Dredge	52	16	11
11	2	Arctica Dredge	0	0	89
11a	1	Beam Trawl	0	0	16
11a	2	Beam Trawl	0	0	86
11g	1	Djarner Dredge	0	0	2
15	1	Arctica Dredge	77	15	56
15	2	Arctica Dredge	31	8	248
15	1	Van Veem Grab	2	0	13
15	2	Van Veem Grab	1	0	15
15	3	Van Veem Grab	1	1	23
15	4	Van Veem Grab	0	0	33
15	5	Van Veem Grab	2	0	14
15	6	Van Veem Grab	2	0	17
15	7	Van Veem Grab	0	0	3
15	8	Van Veem Grab	0	0	11
15	9	Van Veem Grab	0	0	12
15	10	Van Veem Grab	1	0	8
15	3	Djarner Dredge	0	0	2
16	1	Arctica Dredge	43	21	56
16	2	Arctica Dredge	22	4	2
16	3	Arctica Dredge	15	5	3
16	4	Arctica Dredge	65	8	20
16	6	Van Veem Grab	0	0	3
16	10	Van Veem Grab	0	0	8
16	11	Van Veem Grab	0	0	4
16	1	Beam Trawl	0	0	8
<b>TOTALS</b>			<b>360</b>	<b>111</b>	<b>791</b>

**Appendix 1:** Coordinates of all gear deployments and recoveries at the stations visited.

Date	Station	Gear. No.	Lat		Lat		Depth (m)	Gear	Gear status
			Lat N	Mins N	Lat W	mins N			
13/06/2008	RWB	1	53	19.492	4	9.035	10.8 Grab (Van Veem)	Deployed	
13/06/2008	RWB	2	53	19.501	4	9.024	10.9 Grab	Deployed	
13/06/2008	RWB	3	53	19.491	4	9.045	10.8 Grab	Deployed	
13/06/2008	RWB	1	53	19.492	4	9.012	10.2 Tjarner Dredge	Deployed	
13/06/2008	RWB	1	53	19.475	4	9.260	9.2m Beam Trawl	Deployed	
13/06/2008	RWB	1	53	19.705	4	9.599	10.4 2m Beam Trawl	Recovered	
13/06/2008	1	1	53	18.659	5	5.439	179 Grab	Deployed	
13/06/2008	1	2	53	18.677	5	5.481	178 Grab	Deployed	
13/06/2008	1	3	53	18.634	5	5.439	180 Grab	Deployed	
13/06/2008	1	4	53	18.515	5	5.332	174 Grab	Deployed	
13/06/2008	1	5	53	18.595	5	5.456	177 Grab	Deployed	
13/06/2008	1	6	53	18.495	5	5.394	174 Grab	Deployed	
13/06/2008	1	7	53	18.354	5	5.376	169 Grab	Deployed	
13/06/2008	1	1	53	18.452	5	5.322	173 Large Tjarner Dredge	Deployed	
13/06/2008	1	1	53	18.519	5	5.376	176 Large Tjarner Dredge	Recovered	
13/06/2008	1	2	53	18.474	5	5.340	172 Large Tjarner Dredge	Deployed	
13/06/2008	1	2	53	18.437	5	5.244	173 Large Tjarner Dredge	Recovered	
13/06/2008	1	3	53	18.462	5	5.297	155 Large Tjarner Dredge	Deployed	
13/06/2008	1	3	53	18.337	5	5.232	144 Large Tjarner Dredge	Recovered	
13/06/2008	1	1	53	18.195	5	5.079	135 Water Sample	Deployed	
13/06/2008	2	1	53	18.628	5	9.096	101 Large Tjarner Dredge	Deployed	
13/06/2008	2	1	53	18.679	5	9.128	100 Large Tjarner Dredge	Recovered	
13/06/2008	2	1	53	18.677	5	9.071	100 Grab	Deployed	
13/06/2008	2	2	53	18.672	5	9.061	101 Grab	Deployed	
13/06/2008	2	3	53	18.707	5	9.115	100 Grab	Deployed	
13/06/2008	2	4	53	18.742	5	9.045	100 Grab	Deployed	
13/06/2008	2	1	53	18.414	5	9.045	101 Water Sample	Deployed	
14/06/2008	5	1	55	34.978	4	57.350	126 Sidescan sonar	Deployed	
14/06/2008	5	1	55	35.255	4	57.240	112 Sidescan sonar	Recovered	
14/06/2008	5	1	55	35.107	4	57.450	114 Epibenthic Sledge	Deployed	
14/06/2008	5	1	55	35.176	4	57.231	115 Arctica Dredge	Deployed	
14/06/2008	5	1	55	34.908	4	57.135	105 Arctica Dredge	Recovered	
14/06/2008	5	2	55	34.807	4	57.038	100 Arctica Dredge	Deployed	
14/06/2008	5	2	55	35.069	4	57.136	107 Arctica Dredge	Recovered	
14/06/2008	5	1	55	35.121	4	57.252	107 Grab	Deployed	
14/06/2008	5	2	55	35.289	4	57.283	118 Grab	Deployed	
14/06/2008	5	1	55	35.158	4	57.174	106 2m Beam Trawl	Deployed	
14/06/2008	5	1	55	34.692	4	57.096	101 2m Beam Trawl	Recovered	
14/06/2008	5	1	55	34.326	4	56.896	93 Water Sample	Deployed	
15/06/2008	7	1	55	36.797	4	44.135	11.6 Sidescan sonar	Deployed	
15/06/2008	7	1	55	38.856	4	44.163	10.1 Sidescan sonar	Recovered	
15/06/2008	7	1	55	36.805	4	44.073	11.2 Arctica Dredge	Deployed	
15/06/2008	7	1	55	36.780	4	43.985	10.6 Arctica Dredge	Recovered	

Date	Station	Gear. No.	Lat		Lat		Depth (m)	Gear	Gear status
			Lat N	Mins N	Lat W	mins N			
15/06/2008	7	2	55	36.702	4	43.815	11.4 Arctica Dredge	Deployed	
15/06/2008	7	2	55	36.667	4	43.735	11.6 Arctica Dredge	Recovered	
15/06/2008	7	3	55	36.672	4	43.707	11.2 Arctica Dredge	Deployed	
15/06/2008	7	3	55	36.622	4	43.567	11 Arctica Dredge	Recovered	
15/06/2008	7	1	55	36.617	4	43.588	12.1 Large Tjarnar Dredge	Deployed	
15/06/2008	7	1	55	36.496	4	43.549	14.8 Large Tjarnar Dredge	Recovered	
15/06/2008	7	1	55	36.540	4	43.480	12.7 Epibenthic Sledge	Deployed	
15/06/2008	7	1	55	36.608	4	43.679	13 Epibenthic Sledge	Recovered	
15/06/2008	6	1	55	35.133	4	48.215	53 Grab	Deployed	
15/06/2008	6	2	55	35.102	4	48.192	51.9 Grab	Deployed	
15/06/2008	6	1	55	35.103	4	48.222	50.9 Epibenthic Sledge	Deployed	
15/06/2008	6	1	55	34.839	4	48.377	42.6 Epibenthic Sledge	Recovered	
15/06/2008	6	1	55	34.675	4	48.378	43.7 Water Sample	Deployed	
15/06/2008	9	1	55	40.507	4	56.484	74 Sidescan sonar	Deployed	
15/06/2008	9	1	55	41.906	4	57.151	78.5 Sidescan sonar	Recovered	
15/06/2008	9	1	55	41.190	4	56.800	75 Arctica Dredge	Deployed	
15/06/2008	9	1	55	41.350	4	56.900	76.6 Arctica Dredge	Recovered	
15/06/2008	9	2	55	41.095	4	56.810	75.5 Arctica Dredge	Deployed	
15/06/2008	9	2	55	41.376	4	56.987	75 Arctica Dredge	Recovered	
15/06/2008	9	3	55	41.287	4	56.923	75 Arctica Dredge	Deployed	
15/06/2008	9	3	55	41.747	4	57.140	77 Arctica Dredge	Recovered	
15/06/2008	9	1	55	41.626	4	57.215	77.6 Water Sample	Deployed	
15/06/2008	10	1	55	46.831	4	58.509	77.6 Sidescan sonar	Deployed	
15/06/2008	10	1	55	48.460	4	58.548	65.1 Sidescan sonar	Recovered	
15/06/2008	10	1	55	47.890	4	58.506	69.4 Arctica Dredge	Deployed	
15/06/2008	10	1	55	47.544	4	58.449	70.2 Arctica Dredge	Recovered	
15/06/2008	10	2	55	47.399	4	58.442	70 Arctica Dredge	Deployed	
15/06/2008	10	2	55	47.070	4	58.490	74.8 Arctica Dredge	Recovered	
15/06/2008	10	1	55	46.920	4	58.513	76.2 Large Tjarnar Dredge	Deployed	
15/06/2008	10	1	55	47.221	4	58.504	73 Large Tjarnar Dredge	Recovered	
15/06/2008	10	2	55	47.395	4	58.479	71.6 Large Tjarnar Dredge	Deployed	
15/06/2008	10	2	55	47.711	4	58.495	69.8 Large Tjarnar Dredge	Recovered	
15/06/2008	11	1	55	47.781	4	58.407	70.1 Water Sample	Deployed	
16/06/2008	11	1	55	46.535	4	52.914	45.5 Sidescan sonar	Deployed	
16/06/2008	11	1	55	45.280	4	53.182	47.3 Sidescan sonar	Recovered	
16/06/2008	11	1	55	45.347	4	53.195	47.9 Arctica Dredge	Deployed	
16/06/2008	11	1	55	45.537	4	53.110	48.7 Arctica Dredge	Recovered	
16/06/2008	11	2	55	45.750	4	53.064	46.2 Arctica Dredge	Deployed	
16/06/2008	11	2	55	45.869	4	53.035	45.1 Arctica Dredge	Recovered	
16/06/2008	11	1	55	46.343	4	53.037	45.9 Water Sample	Deployed	
16/06/2008	11A	1	55	47.852	4	54.272	23.4 2m Beam Trawl	Deployed	
16/06/2008	11A	1	55	47.866	4	54.453	38.3 2m Beam Trawl	Recovered	
16/06/2008	11A	2	55	47.902	4	54.855	34.1 2m Beam Trawl	Deployed	
16/06/2008	11A	2	55	47.950	4	55.166	30.9 2m Beam Trawl	Recovered	
16/06/2008	WB	*1	55	44.342	5	5.268	46 Large Tjarnar Dredge	Deployed	
16/06/2008	WB	1	55	44.203	5	5.361	45.1 Large Tjarnar Dredge	Recovered	

Date	Station	Gear. No.	Lat		Lat		Depth (m)	Gear	Gear status
			Lat N	Mins N	Lat W	mins N			
16/06/2008	WB	2	55	44.236	5	5.356	45.9 Large Tjarner Dredge	Deployed	
16/06/2008	WB	2	55	44.408	5	5.233	45.1 Large Tjarner Dredge	Recovered	
16/06/2008	WB	3	55	44.984	5	5.337	37.4 Large Tjarner Dredge	Deployed	
16/06/2008	WB	3	55	44.889	5	5.415	38.2 Large Tjarner Dredge	Recovered	
16/06/2008	WB	4	55	43.756	5	6.126	48 Large Tjarner Dredge	Deployed	
16/06/2008	WB	4	55	43.640	5	6.243	65.5 Large Tjarner Dredge	Recovered	
16/06/2008	12	1	55	55.270	5	23.266	149 Grab	Deployed	
16/06/2008	12	1	55	55.248	5	23.164	149 Grab	Deployed	
16/06/2008	12	1	55	55.350	5	23.247	149 Agasi Dredge	Deployed	
16/06/2008	12	1	55	55.597	5	22.891	145 Agasi Dredge	Recovered	
16/06/2008	12	1	55	55.086	5	23.463	146 Water Sample	Deployed	
16/06/2008	12	1	55	55.856	5	22.560	91 Grab	Deployed	
16/06/2008	12	2	55	55.799	5	22.697	150 Grab	Deployed	
16/06/2008	12	1	55	55.582	5	22.863	145 Agasi Dredge	Deployed	
16/06/2008	12	1	55	55.794	5	22.530	Agasi Dredge	Recovered	
16/06/2008	12	1	55	56.891	5	21.343	34.4 Grab	Deployed	
16/06/2008	12	2	55	57.038	5	20.700	25 Grab	Deployed	
16/06/2008	12	3	55	57.000	5	20.000	17.2 Grab	Deployed	
17/06/2008	15	1	56	0.160	5	25.800	16.2 Sidescan sonar	Deployed	
17/06/2008	15	1	55	59.153	5	25.268	36 Sidescan sonar	Recovered	
17/06/2008	15	1	55	59.462	5	25.425	26.1 Arctica Dredge	Deployed	
17/06/2008	15	1	55	59.694	5	25.525	25.1 Arctica Dredge	Recovered	
17/06/2008	15	2	55	59.800	5	25.628	24.1 Arctica Dredge	Deployed	
17/06/2008	15	2	56	0.026	5	25.715	21.6 Arctica Dredge	Recovered	
17/06/2008	12A	1	55	57.862	5	22.842	132 Epibenthic Sledge	Deployed	
17/06/2008	12A	1	55	57.792	5	22.922	134 Epibenthic Sledge	Recovered	
17/06/2008	13	1	56	10.028	5	5.281	18.7 Grab	Deployed	
17/06/2008	13	2	56	10.060	5	5.259	17 Grab	Deployed	
17/06/2008	13	3	56	9.855	5	5.688	34.4 Grab	Deployed	
17/06/2008	13	4	56	9.903	5	5.696	37.4 Grab	Deployed	
17/06/2008	13	5	56	9.820	5	6.088	68 Grab	Deployed	
17/06/2008	13	6	56	9.890	5	6.119	77.6 Grab	Deployed	
17/06/2008	13	7	56	9.562	5	7.043	116 Grab	Deployed	
17/06/2008	13	8	56	9.670	5	7.040	120 Grab	Deployed	
17/06/2008	13	1	56	9.506	5	7.225	115 Epibenthic Sledge	Deployed	
17/06/2008	13	1	56	9.408	5	7.338	113 Epibenthic Sledge	Recovered	
17/06/2008	13	1	56	9.399	5	7.427	112 Water Sample	Deployed	
17/06/2008	14	1	56	1.185	5	19.760	57 Grab	Deployed	
17/06/2008	14	2	56	1.210	5	19.780	Grab	Deployed	
17/06/2008	14	1	56	1.242	5	19.818	61 Water Sample	Deployed	
17/06/2008	15	1	55	59.409	5	25.420	28.6 Grab	Deployed	
17/06/2008	15	2	55	59.435	5	25.477	28.6 Grab	Deployed	
17/06/2008	15	3	55	59.470	5	25.473	27 Grab	Deployed	
17/06/2008	15	4	55	59.535	5	25.471	26 Grab	Deployed	
17/06/2008	15	5	55	59.571	5	25.458	25.3 Grab	Deployed	
17/06/2008	15	6	55	59.604	5	25.446	25 Grab	Deployed	

Date	Station	Gear. No.	Lat		Lat W	Depth mins N (m)	Gear	Gear status
			Lat N	Mins N				
17/06/2008	15	7	55	59.636	5	25.433	25.3 Grab	Deployed
17/06/2008	15	8	55	59.674	5	25.415	24.9 Grab	Deployed
17/06/2008	15	9	55	59.710	5	25.407	24.2 Grab	Deployed
17/06/2008	15	10	55	59.746	5	25.399	23.9 Grab	Deployed
18/06/2008	16	1	55	35.257	5	24.331	63 Sidescan sonar	Deployed
18/06/2008	16	1	55	34.757	5	23.851	65.7 Sidescan sonar	Recovered
18/06/2008	16	2	55	34.906	5	23.284	43.7 Sidescan sonar	Deployed
18/06/2008	16	2	55	35.625	5	23.957	44.1 Sidescan sonar	Recovered
18/06/2008	16	1	55	35.355	5	23.676	47.5 Arctica Dredge	Deployed
18/06/2008	16	1	55	35.279	5	23.556	46.2 Arctica Dredge	Recovered
18/06/2008	16	2	55	35.196	5	23.498	51.2 Arctica Dredge	Deployed
18/06/2008	16	2	55	35.094	5	23.411	50.2 Arctica Dredge	Recovered
18/06/2008	16	3	55	35.166	5	24.198	61.9 Arctica Dredge	Deployed
18/06/2008	16	3	55	35.066	5	24.079	60.1 Arctica Dredge	Recovered
18/06/2008	16	4	55	34.921	5	23.946	61.2 Arctica Dredge	Deployed
18/06/2008	16	4	55	34.809	5	23.815	61.1 Arctica Dredge	Recovered
18/06/2008	16	1	55	34.806	5	23.715	53 Grab	Deployed
18/06/2008	16	2	55	34.876	5	23.934	63.4 Grab	Deployed
18/06/2008	16	3	55	34.960	5	23.952	58.7 Grab	Deployed
18/06/2008	16	4	55	35.057	5	24.144	61.6 Grab	Deployed
18/06/2008	16	5	55	35.134	5	24.166	62 Grab	Deployed
18/06/2008	16	6	55	25.239	5	24.172	60.1 Grab	Deployed
18/06/2008	16	7	55	35.248	5	24.383	68.2 Grab	Deployed
18/06/2008	16	1	55	35.194	5	24.193	62.1 3m Beam Trawl	Deployed
18/06/2008	16	1	55	35.067	5	23.988	59.4 3m Beam Trawl	Recovered
18/06/2008	16	1	55	35.606	5	23.046	15.6 Grab	Deployed
18/06/2008	16	2	55	35.405	5	23.055	15.3 Grab	Deployed
18/06/2008	16	3	55	35.171	5	23.325	46.2 Grab	Deployed
18/06/2008	16	4	55	35.207	5	23.359	45.5 Grab	Deployed
18/06/2008	16	5	55	34.827	5	24.050	76.9 Grab	Deployed
18/06/2008	16	6	55	34.903	5	24.063	66.9 Grab	Deployed
18/06/2008	16	7	55	34.620	5	24.522	119 Grab	Deployed
18/06/2008	16	8	55	34.735	5	24.579	121 Grab	Deployed
18/06/2008	16	1	55	34.786	5	24.534	120 Water Sample	Deployed
19/06/2008	CL**	1	55	25.888	5	35.245	17.6 Grab	Deployed
19/06/2008	CL	2	55	25.269	5	35.086	17.5 Grab	Deployed
19/06/2008	CL	3	55	25.336	5	35.246	18.5 Grab	Deployed
20/06/2008	12	1	55	55.810	5	22.620	118 Grab	Deployed
20/06/2008	12	2	55	55.739	5	22.809	147 Grab	Deployed
20/06/2008	12	3	55	55.792	5	22.757	149 Grab	Deployed
20/06/2008	12	1	55	55.763	5	22.698	149 Epibenthic Sledge	Deployed
20/06/2008	12	1	55	55.822	5	22.879	148 Epibenthic Sledge	Recovered
20/06/2008	12	2	55	55.834	5	22.787	150 Epibenthic Sledge	Deployed
20/06/2008	12	2	55	55.719	5	22.653	135 Epibenthic Sledge	Recovered
20/06/2008	13	1	56	10.138	5	5.657	39 Sidescan sonar	Deployed

Date	Station	Gear. No.	Lat		Lat		Depth (m)	Gear	Gear status
			Lat N	Mins N	Lat W	mins N			
20/06/2008	13	1	56	10.735	5	5.011	23.5 Sidescan sonar	Recovered	
20/06/2008	13	1	56	10.344	5	5.411	39.4 Arctica Dredge	Deployed	
20/06/2008	13	1	56	10.167	5	5.672	43.6 Arctica Dredge	Recovered	
20/06/2008	13	1	56	10.017	5	5.213	15.9 Grab	Deployed	
20/06/2008	13	2	56	10.044	5	5.167	15 Grab	Deployed	
20/06/2008	13	3	56	10.014	5	5.201	15.4 Grab	Deployed	
20/06/2008	13	4	56	10.037	5	5.181	14.6 Grab	Deployed	
20/06/2008	13	5	56	9.976	5	5.518	26 Grab	Deployed	
20/06/2008	13	6	56	9.963	5	5.564	31.9 Grab	Deployed	
20/06/2008	13	7	56	9.967	5	5.546	31 Grab	Deployed	
20/06/2008	13	8	56	9.986	5	5.568	31.8 Grab	Deployed	
20/06/2008	13	9	56	9.948	5	5.800	44.5 Grab	Deployed	
20/06/2008	13	10	56	9.947	5	5.813	44.9 Grab	Deployed	
20/06/2008	13	11	56	9.925	5	5.779	46.9 Grab	Deployed	
20/06/2008	13	12	56	9.944	5	5.816	47.4 Grab	Deployed	
20/06/2008	13	13	56	9.966	5	5.882	48.8 Grab	Deployed	
20/06/2008	13	14	56	9.929	5	5.981	68 Grab	Deployed	
20/06/2008	13	15	56	9.975	5	5.985	66.6 Grab	Deployed	
20/06/2008	13	16	56	9.990	5	5.908	56.5 Grab	Deployed	
20/06/2008	13	1	56	9.993	5	6.347	117 temp profile	Deployed	
20/06/2008	13	1	56	9.661	5	5.979	35.8 Epibenthic Sledge	Deployed	
20/06/2008	13	1	56	9.791	5	5.748	35.6 Epibenthic Sledge	Recovered	
21/06/2008	LS***	1	55	49.171	5	13.145	31.2 Sidescan sonar	Deployed	
21/06/2008	LS	1	55	49.139	5	12.330	39.4 Sidescan sonar	Recovered	
21/06/2008	LS	1	55	49.116	5	12.556	38.4 Arctica Dredge	Deployed	
21/06/2008	LS	1	55	49.129	5	12.773	33.3 Arctica Dredge	Recovered	
21/06/2008	LS	1	55	49.455	5	12.663	14.2 Grab	Deployed	
21/06/2008	LS	2	55	49.450	5	12.657	15 Grab	Deployed	
21/06/2008	IW****	1	55	47.234	5	11.857	75.1 Agasi Dredge	Deployed	
21/06/2008	IW	1	55	47.045	5	11.897	77.6 Agasi Dredge	Recovered	
21/06/2008	5	1	55	35.370	5	57.333	120 2m Beam Trawl	Deployed	
21/06/2008	5	1	55	35.084	5	57.231	104 2m Beam Trawl	Recovered	
21/06/2008	5	1	55	35.164	5	57.009	102 temp profile	Deployed	

\* WB = Whiting Bay

\*\* CL = Campbeltown Loch

\*\*\* LS = Lamont Shelf

\*\*\*\* IW = Inchmarnock Water