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MRV *Scotia*

Survey 1019S

## **PROGRAMME**

22-31 July 2019

**Loading:** Aberdeen, 19 July 2019

**Boarding:** Aberdeen, 21 July 2019

**Unloading:** Aberdeen, 31 July 2019

In setting the survey 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 Marine Scotland's Working Time Policy (Lab Notice 34/03). In addition, the Scientist-in-Charge must formally review the risk assessments for the survey with staff on-board before work is commenced.

In the interest of efficient data management it is now mandatory to return the survey report, to I Gibb and the Survey Summary Report (old ROSCOP form) to M Geldart, within four weeks of a survey ending. In the case of the Survey Summary Report a nil return is required, if appropriate.

**Project:** 20566 (SP01W0), 10 days.

## **Sampling Gear & Equipment**

OSIL multi-corer (MSS)

2 x day grabs (MSS)

Box corer (MSS)

CTD & Niskin bottles (MSS)

Gravity corer (SAMS)

Simrad EK60

Vessel-mounted thermo-salinograph

A refrigerator has been requested, for storage of mud (TBC)

## **Objectives**

1. Sediment sampling in the Moray Firth (grabs & cores).
2. Sediment sampling along transect from Moray Firth to Fladen Ground (grabs & cores).
3. Sediment sampling on the Fladen Ground (grabs & cores).
4. Sediment sampling along transect from Fladen to Pentland Firth (grabs & cores).
5. Gravity coring in Loch Eriboll.
6. Sediment sampling in North Minch and Sound of Sleat (grabs & cores).
7. Sediment sampling in sea lochs east of Skye (Lochs Nevis, Hourn and Alsh).
8. Water sampling at each grab/core station and on transit (surface and bottom).

## **Procedure**

This survey will carry out research affiliated to Scotland's Blue Carbon Forum, a research area with significant ministerial support and referenced in the 2017-18 Programme for Government. The current focus revolves around measuring the ability for various habitats to sequester carbon, understand how it is stored for the long term, and builds an evidence base on the effects that human activities may have on these processes. The majority of the work is seabed

sediment sampling using grabs and cores, in various habitats and regimes of anthropogenic disturbance (e.g. fishing grounds, sea lochs).

All loading and setup of scientific equipment will be undertaken on 19 July. All scientific staff and visitors will join the vessel at least one hour before sailing or the night before. Once the vessel has departed Aberdeen and, after all vessel drills have been completed, the vessel will head for the first sampling location in the Moray Firth.

The order in which each sampling location will be collected will be agreed each day with the Captain, Fishing Master and SIC.

Sampling will be undertaken as per the objectives above and as weather dictates.

There will be three scientific shifts per day: 00:00-08:00; 08:00-16:00 and 16:00-24:00.

The schedule is busy, and desired area of study between research groups is large. The draft itinerary (below) is described to try and maximise achievable work, but is subject to variation in the event of poor weather, etc.

### **Health, safety and environment**

- MSS risk assessments are in place for all MSS scientific equipment.
- A risk assessment has been written and is available from SAMS for the gravity corer.
- All scientists and deck crew will be requested to read all relevant risk assessments prior to starting operations.
- The risk assessments will be made available to the ship's bridge.
- Scientific work briefings will be carried out on board the vessel by the SIC.
- A tour of the vessel and muster drill will be carried out on board by the ship's officers and crew.
- A waste management and environmental briefing will be provided by the ship's crew.
- Scientists will be briefed to conduct requests to the bridge through the SIC.

Submitted:  
E Edwards  
16 July 2019

Approved:  
I Gibb  
17 July 2019

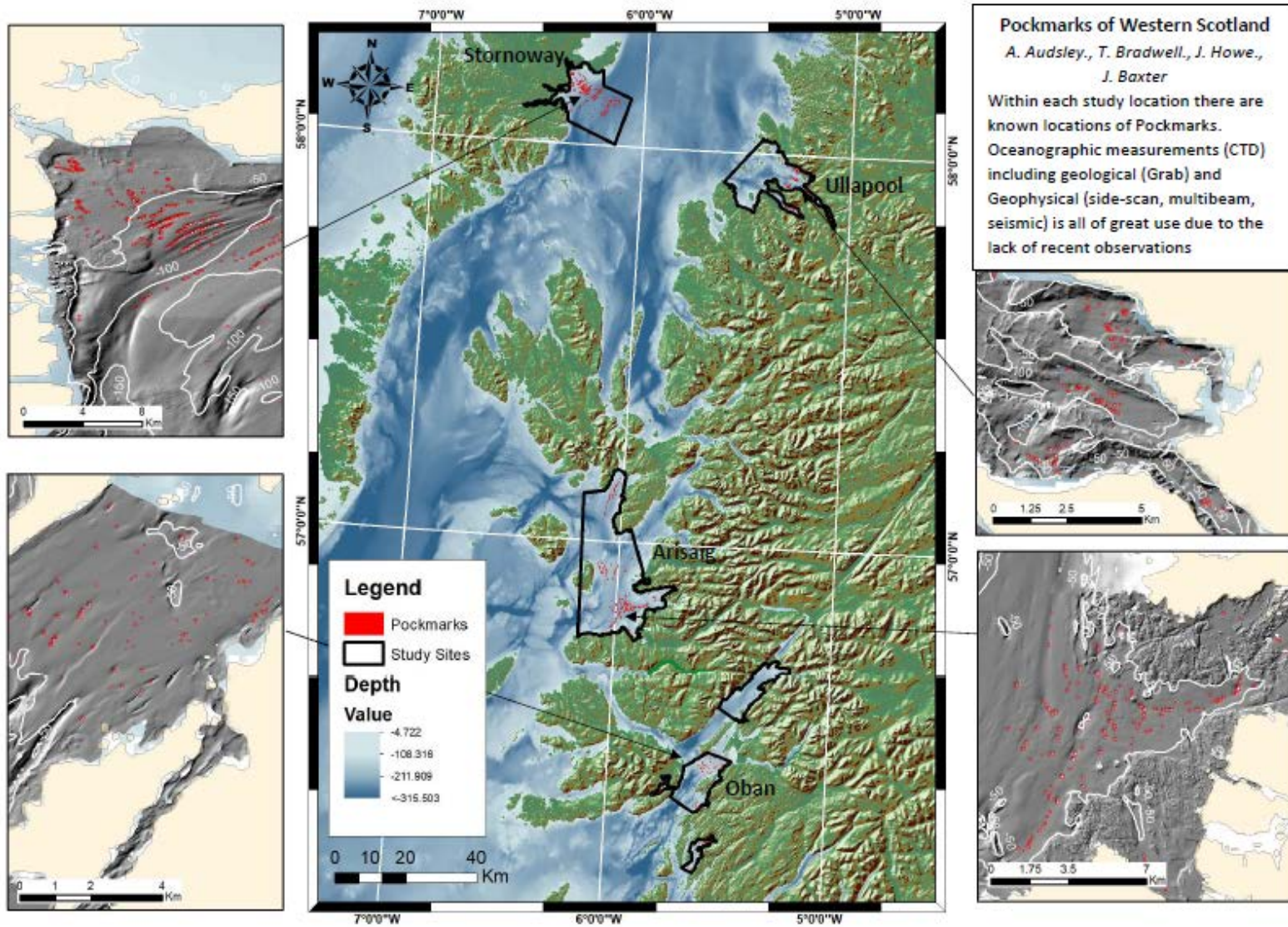
## Itinerary

Date		Location	Group responsible	Description of activities	Physical sampling equipment required	Acoustic survey equipment required
21-Jul-19	16:00 - 00:00	Aberdeen		Scientists board Scotia after 18:00		
22-Jul-19	00:00 - 08:00	Aberdeen		Depart Aberdeen harbour; safety drills		EK60
	08:00 - 16:00	in transit	St Andrews	Transit to Moray Firth, taking sediment grabs every 2h	Day grab, CTD	EK60
	16:00 - 00:00	Moray Firth	St Andrews	Arrive in Moray Firth , commence grabbing/coring	Day grab, mega-corer, CTD	EK60
23-Jul-19	00:00 - 08:00	Moray Firth	St Andrews	Grabbing and coring in Moray Firth	Day grab, mega-corer, CTD	EK60
	08:00 - 16:00	in transit	St Andrews	Transit to Fladen, taking sediment grabs every 2h	Day grab, CTD	EK60
	16:00 - 00:00	in transit	St Andrews	Transit to Fladen, taking sediment grabs every 2h	Day grab, CTD	EK60
24-Jul-19	00:00 - 08:00	Fladen Ground	St Andrews	Arrive in Fladen, commence grabbing/coring	Day grab, mega-corer, box corer, CTD	EK60
	08:00 - 16:00	Fladen Ground	St Andrews	Grabbing and coring in Fladen	Day grab, mega-corer, box corer, CTD	EK60
	16:00 - 00:00	Fladen Ground	St Andrews	Grabbing and coring in Fladen	Day grab, mega-corer, box corer, CTD	EK60
25-Jul-19	00:00 - 08:00	in transit	St Andrews	Transit towards west, taking sediment grabs every 2h	Day grab, CTD	EK60

	08:00 - 16:00	in transit	St Andrews	Transit towards west, taking sediment grabs every 2h	Day grab, CTD	EK60
	16:00 - 00:00	Loch Eriboll	St Andrews	2 x long gravity cores in Loch Eriboll	SAMS gravity corer, CTD	EK60
26-Jul-19	00:00 - 08:00	in transit	St Andrews	Transit into North Minch, taking sediment grabs every 2h	Day grab, CTD	EK60
	08:00 - 16:00	North Minch	St Andrews	Arrive in North Minch, commence grabbing/coring	Day grab, mega-corer, CTD	EK60
	16:00 - 00:00	North Minch	St Andrews	Grabbing and coring in North Minch	Day grab, mega-corer, CTD	EK60
27-Jul-19	00:00 - 08:00	North Minch	Stirling	Research on pockmarks - Stornoway Bay and western Minch	TBC - grabbing	EK60
	08:00 - 16:00	North Minch	Stirling	Research on pockmarks - Stornoway Bay and western Minch	TBC - grabbing	EK60
	16:00 - 00:00	North Minch	Stirling	Research on pockmarks - approaches to Summer Isles, Loch Broom, Little Loch Broom	TBC - grabbing	EK60
28-Jul-19	00:00 - 08:00	North Minch	Stirling	Research on pockmarks - approaches to Summer Isles, Loch Broom, Little Loch Broom	TBC - grabbing	EK60
	08:00 - 16:00	in transit		Transit to Bay of Arisaig/Small Isles region		EK60
	16:00 - 00:00	Small Isles	Stirling	Research on pockmarks - Bay of Arisaig/Small Isles region	TBC - grabbing	EK60
29-Jul-19	00:00 - 08:00	Sea lochs east of Skye	St Andrews	Grabbing and coring in sea lochs	Day grab, mega-corer	EK60
	08:00 - 16:00	Sea lochs east of Skye	St Andrews	Grabbing and coring in sea lochs	Day grab, mega-corer	EK60

	16:00 - 00:00	Sea lochs east of Skye	St Andrews	Grabbing and coring in sea lochs	Day grab, mega-corer	EK60
30-Jul-19	00:00 - 08:00	in transit		Commence return to Aberdeen		EK60
	08:00 - 16:00	in transit		Returning to Aberdeen		EK60
	16:00 - 00:00	in transit		Returning to Aberdeen		EK60
31-Jul-19	00:00 - 08:00	in transit		Arrive back to Aberdeen		EK60
	08:00 - 16:00	Aberdeen		Unloading		
	16:00 - 00:00					

**Pockmarks – University of Stirling. Regions in North Minch and south of Skye are in range of this survey.**



**Details of the proposed UoStA study locations. Only regions 1, 2 and 4 will be surveyed.**

Site Number	Location	Coordinates (Centre of polygon)	Sediment type	Fishing intensity (>2cm penetration depth)	MPA? (name, type, and year established)	Backscatter?
1	Fladen Ground	58.629092 0.282441	Mud, Sandy Mud, Muddy Sand	Low/Medium	Central Fladen NCMPA (2014)	No
2	Moray Firth	57.877183 -2.913175	Sandy Mud, Muddy Sand, Gravel	Low/Medium	Moray Firth SAC (2005)	Partial
4	North Minch	57.200570 -6.248505	Mud, Muddy Gravel, Gravel, Sandy Mud	Medium/High	Inner Hebrides and the Minches cSAC/SCI (2017)	Partial

**Legend**

 Proposed Sites

**Proposed site areas**

