JNCC Report
No. 577

Cruise Report: 1714S Solan Bank Reef SCI survey

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December 2015

ISSN 0963 8901

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This report should be cited as:

O'Connor, J. 2015. Cruise Report: 1714S Solan Bank Reef SCI survey. *JNCC Report*, No. 577

Summary

The Joint Nature Conservation Committee (JNCC) and Marine Scotland Science (MSS) undertook an offshore seabed survey of Solan Bank Reef Site of Community Importance (SCI) on the MRV Scotia from 28 October 2014 to 9 November 2014.

The survey was planned with the aim of evaluating whether sponge morphological abundance can be sufficiently measured from drop down camera images and videos, to inform development of a national indicator of 'Good Environmental Status' as part of the UK's obligations under the Marine Strategy Framework Directive (MSFD). Initial baseline data on epifaunal communities and associated environmental variables in the Solan Bank SCI was collected, to assist in determining whether the indicator is viable for UK offshore waters. Data collected on this survey should enable an assessment of whether there are sufficient abundances of different sponge morphologies at the site to detect significant change in these communities. One hundred and sixty-six combined Drop Frame Drop Down Video (DDV) and Seabird 19 (CTD) transects were completed and Acoustic Doppler Current Profile (ADCP) data from three stations were collected.

Please note that observations made in the Cruise Report represent preliminary field observations. These observations have not been subject to Quality Assurance procedures. This disclaimer should be included when referencing the Cruise Report.

Contents

1 Introduction

The Joint Nature Conservation Committee (JNCC) and Marine Scotland Science (MSS) undertook an offshore seabed survey of Solan Bank Reef Site of Community Importance (SCI) on the MRV Scotia. The survey departed Aberdeen on 28 October 2014 and arrived back into Aberdeen on 9 November 2014.

Solan Bank Reef SCI (Figure 1) is located approximately 50km north of Cape Wrath on the Scottish mainland. The site represents the Annex I reef sub-types 'bedrock' and 'stony' reef (JNCC 2012).

For further information on Solan Bank Reef SCI please see:
http://jncc.defra.gov.uk/page-6542

1.1 Scientific Staff

The survey team included scientists from Marine Scotland Science and the Joint Nature Conservation Committee (JNCC).

Original content was created pre-GDPR and has been removed as it contained personal information. No scientific or technical content has been removed.

1.2 Site location

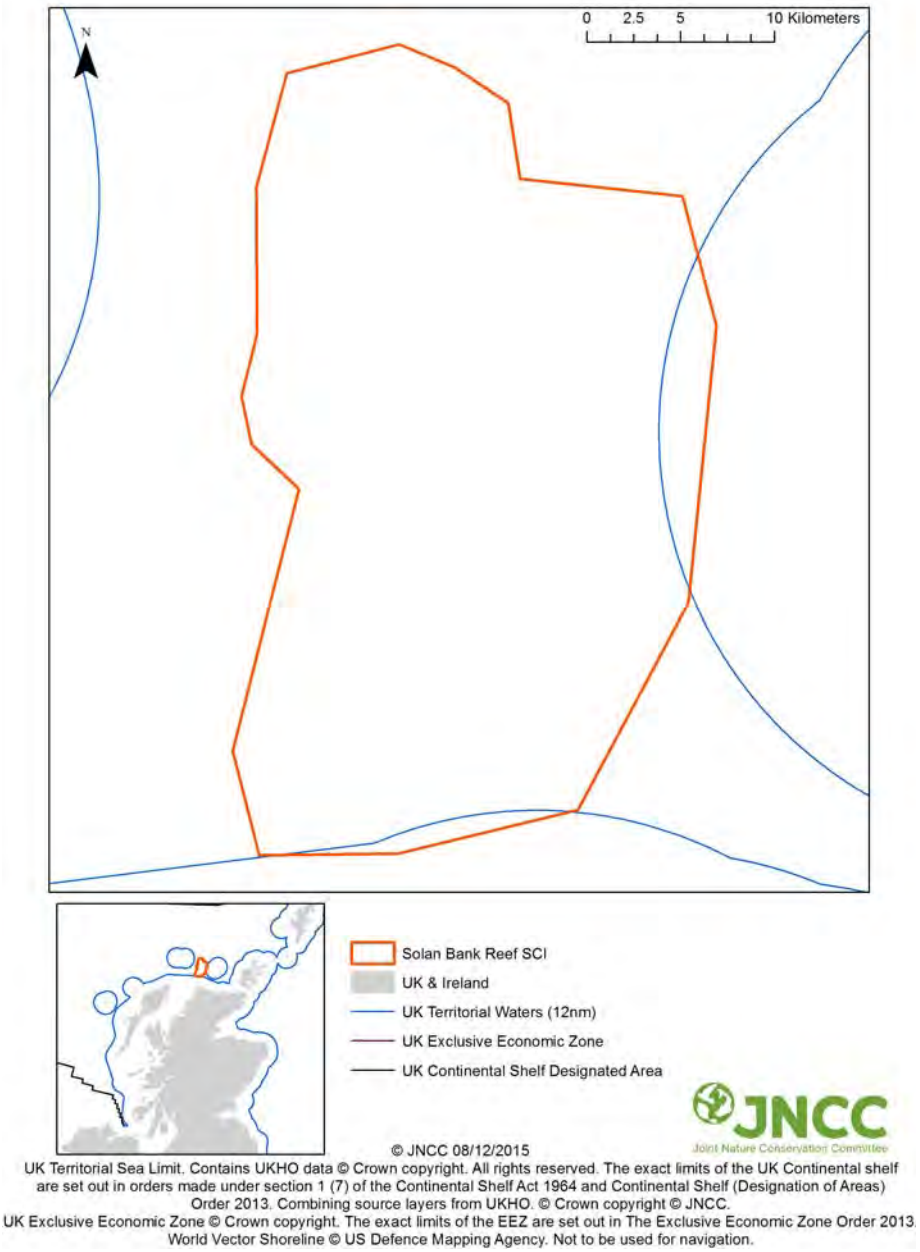


Figure 1. Solan Bank Reef SCI location.

1.3 Existing Information Used to Inform Survey Planning

JNCC commissioned survey CEND1108 aboard the RV Cefas Endeavour visited Solan Bank Reef SCI from 24-29 May 2008 (Whomersley *et al* 2010).

- Corridors of acoustic data coverage were acquired, providing high resolution sidescan sonar and multibeam echo-sounder data.
- Video and still imagery was collected at 44 sites using a drop camera system.
- Benthic grab sampling was also undertaken with:
    - a Hamon grab, fitted with a video camera, to sample sandy areas identified during the deployment of the drop camera; and

- a rock dredge to sample cobbles. Both the Hamon grab and rock dredge provided specimens for biological analyses.

The acoustic data and groundtruthing samples collected were used to identify and interpret the extent of substrate that qualified as Annex I habitat in this area.

In addition, full coverage multibeam bathymetry and backscatter data was collected for the Maritime and Coastguard Agency (MCA) under the Civil Hydrography Programme (CHP) at the site (Figure 2). This has subsequently been processed and interpreted through an MoA between JNCC, National Oceanography Centre (NOC) , British Geological Survey (BGS), Scottish Natural Heritage (SNH) and Marine Scotland, and was available to inform survey planning.

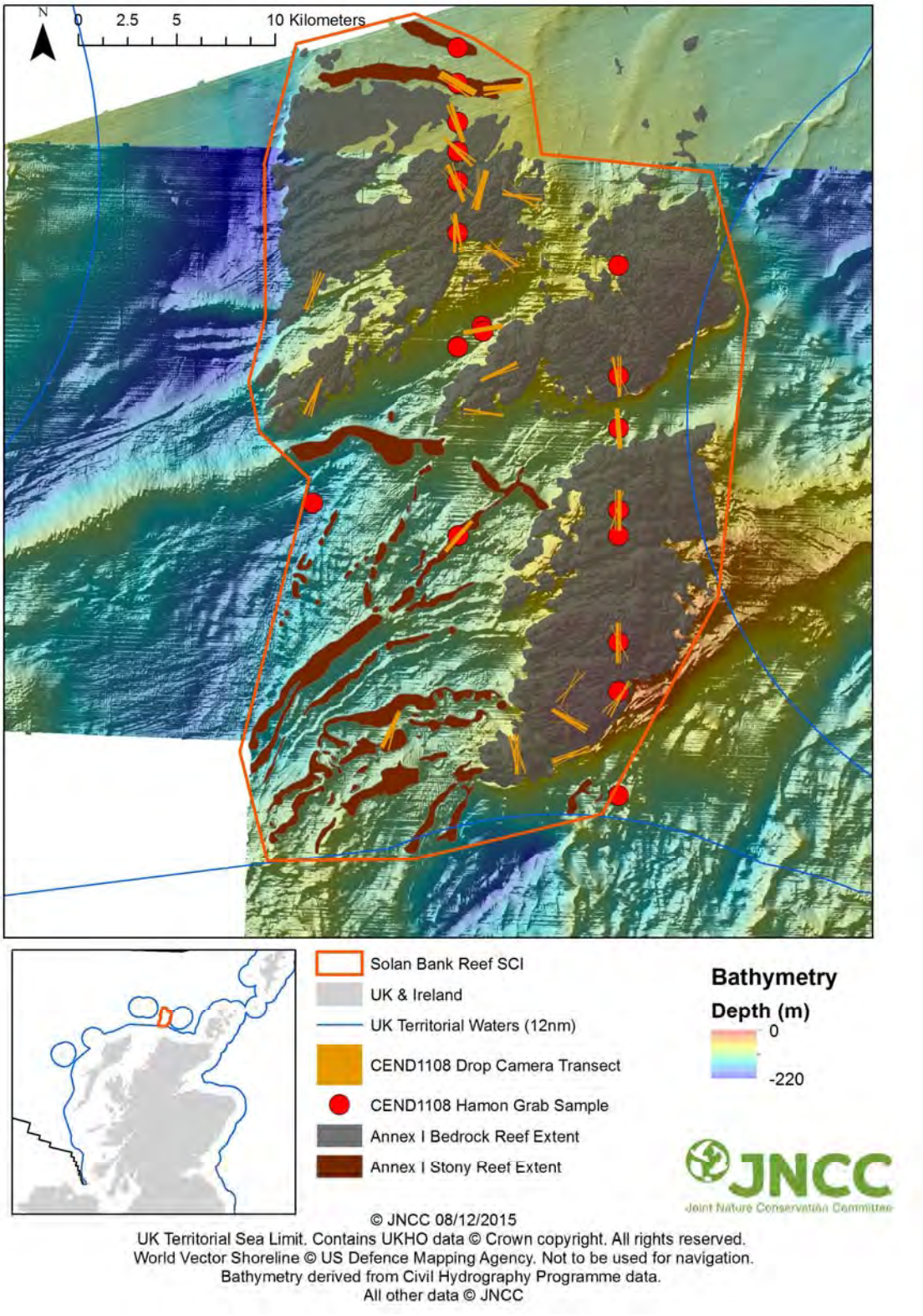


Figure 2. Solan Bank Reef SCI existing data map showing bathymetry (derived from Civil Hydrography Programme (CHP) data provided by Maritime and Coastguard Agency (MCA)), delineated Annex I reef habitats and locations of CEND1108 Hamon Grab and Drop Camera sampling stations.

2 Aims & Objectives

The aim of the 1714S survey to Solan Bank was to gather seabed evidence to inform development of a national indicator of 'Good Environmental Status' as part of the UK's obligations under the Marine Strategy Framework Directive (MSFD).

The proposed indicator is one of a suite of indicators aimed at assessing the status of shallow sub-littoral rock habitats at the regional scale across UK waters, and focuses on changes in sponge morphological diversity and epifaunal diversity in response to natural variables and human-induced pressures.

The objectives of the survey, listed in order of priority, were:

1. Gather high resolution underwater camera video and still transects and quadrats using a Drop Down Video (DDV) system (see Section 4.1) to:
    a) Ascertain whether DDV derived underwater camera video and stills data can be used to sufficiently estimate sponge morphological abundance and anthozoan abundance per unit area (e.g. video tow or still image).
    b) Ascertain whether underwater camera video and stills data can be used to measure patchiness of sponge and other epifaunal communities, which may be a response to physical damage[1].
    c) Initiate collection of potential[2] baseline data on sponge morphological abundance and epifaunal composition and abundance to enable future testing of the indicator.
2. Gather associated environmental data where possible, such as temperature, depth, conductivity and turbidity (see Section 4.1).
3. Gather high resolution underwater camera video and stills data using a Drop Down Video (DDV) system to update existing habitat maps of the site (contingency objective)
4. Gather benthic current flow speed and direction data (see Section 4.2, contingency objective)

Further contingency objectives in more sheltered locations were identified in the planning stage in case of a prolonged period of bad weather, however these were not required.

[1] Evidence of physical damage observed was recorded and reported (see **9 Human Activity**)
[2] Data collected according to the sampling strategy outlined below. Analysis of data collected will determine whether a baseline dataset has been collected

3 Sampling Design

3.1 Drop Frame transects

3.1.1 Targeted Sampling stations

Targeted sampling was undertaken in areas where sponges had been observed on the CEND1108 survey of the site in 2008, or were deemed likely to occur based on existing habitat data for site. Effort was concentrated in areas of the site previously delineated as bedrock reef and as stony reef by Whomersley *et al* (2010).

Targeted sampling was undertaken to increase the likelihood of encountering sponge and associated epifaunal species, to meet Objectives 1a, 1c, 2 and 3.

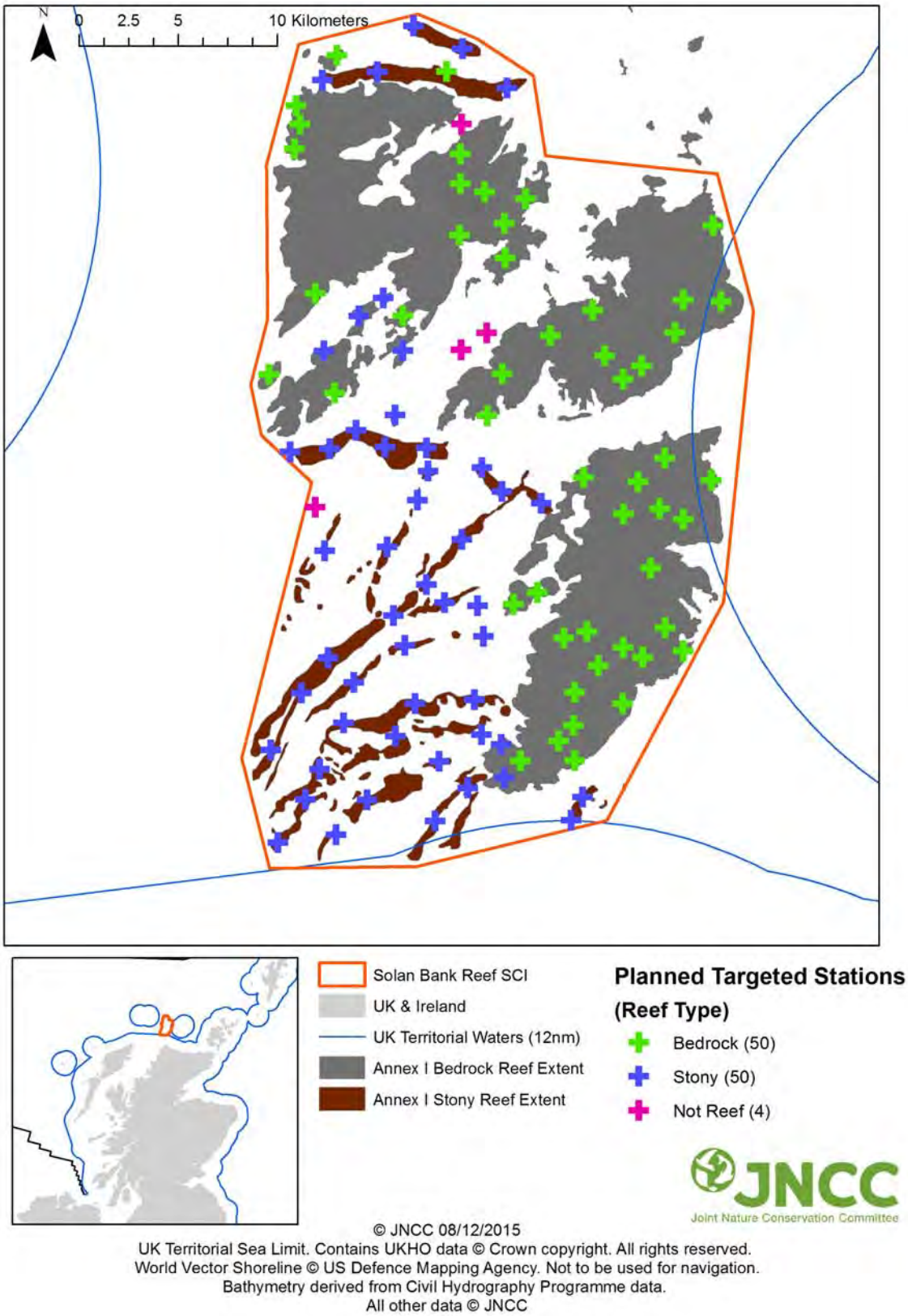


Figure 3. Planned targeted stations to be sampled.

3.1.1.1 Annex I bedrock reef sample stations

Derived bathymetry data layers (depth, relief, and slope) were assessed to identify areas of varying slope values and relief within the Annex I bedrock reef previously delineated at the site.

Station locations were identified to allow transects to cross heterogeneous seabed and/or boundaries between homogenous seabed types to increase the likelihood of sampling a variety of species/morphologies by increasing the variety of habitats sampled per transect.

3.1.1.2 Annex I stony reef sample stations

Derived bathymetry data layers (depth, relief and slope) were assessed to identify areas of varying slope values and relief within the Annex I stony reef previously delineated at the site (Whomersley *et al* 2010).

Stations were identified to allow transects to cross the crests of the areas of exposed boulders and cobbles to encompass areas on and off crest, to increase the likelihood of sampling a variety of species/morphologies by increasing the variety of habitats sampled per transect.

3.1.1.3 Non-Annex I reef sample station

One station outside of the areas delineated as Annex I reef was visited, as sponge species were observed at this station on the CEND1108 survey.

3.1.2 Random Stratified Sampling stations

Random Stratified Sampling was undertaken to enable a statistically significant assessment of the sponge and associated epifaunal communities observed be carried out, in line with the survey objectives.

Sample stations were stratified by **substrate** and by **pressure**.

3.1.2.1 Substrate

Sampling was restricted to the areas of Annex I bedrock reef previously delineated at the site, to increase comparability between sample boxes and to increase the likelihood of sampling sponge communities, which are associated with the less scoured bedrock reef (JNCC 2012). Please note that samples were not stratified by scour level.

3.1.2.2 Pressure

Oil and gas exploration is not operating in the region of Solan Bank Reef, and no cables or pipelines run in the vicinity of the site. Similarly no renewable energy structures occur in the region of the site (JNCC 2012).

Sampling was stratified by creeling (static gear) fishing activity data available for the site (VMS ping and grid records of static fishing gear activity from 2009-2013, and historic plotter data). As wide a temporal range as possible of fishing activities at the site was used to assess pressure, as some of the species of interest are slow growing.

3.1.2.3 Areas of interest (Boxes)

Three Annex 1 Bedrock Reef Boxes of similar area and different activities and activity levels were identified following analysis of fishing activity data (see Table 1 and Figure 4, below). These Boxes were selected to represent two areas of high mobile and static gear activity (**A** and **B** respectively), and an area of lower activity (**C**).

Selecting stations (points)

Thirty-five stations each were randomly assigned to Boxes A, B and C, with a minimum spacing of 500m between each point. Stations were assigned by randomly placing points inside the boundary of each Box using the *Create Random Points (Data Management)* tool in ArcGIS 10.1.

The station locations represent the planned midpoints of each transect.

Table 1. Boxes and stations to be sampled representing areas of high and no pressure at Solan Bank SCI.

Box	Description	Area (hectares)	Number of Stations
A	Mobile gear activity	8183	35
B	Static gear activity	8188	35
C	Low activity (both mobile and static gears)	8163	35

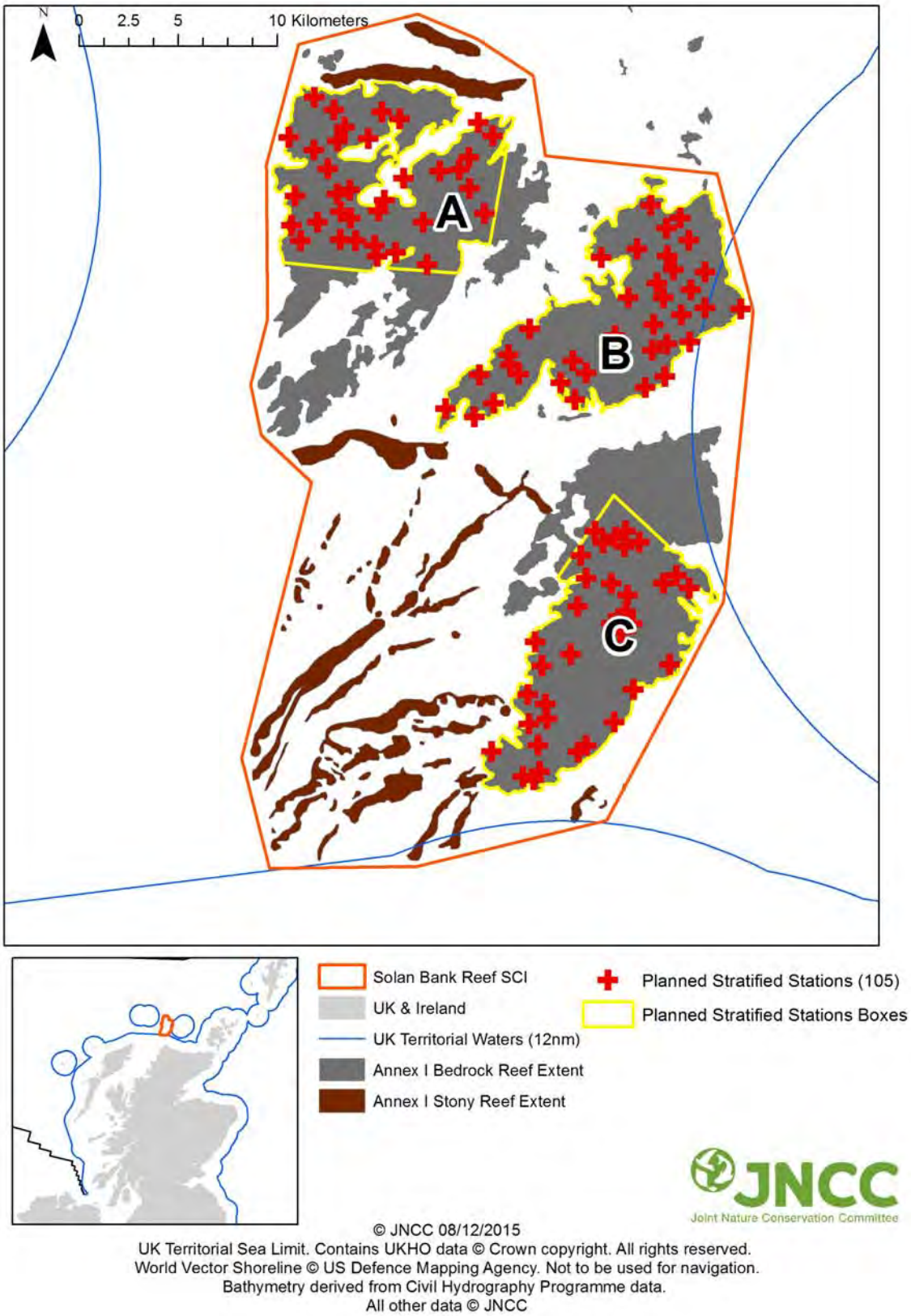


Figure 4. Planned stratified station boxes and stations to be sampled representing areas of high and low pressure in Annex 1 Bedrock Reef areas at Solan Bank SCI.

3.2 ADCP Sampling

ADCP stations were selected to maximise coverage across the site and on the substrate features of interest (Annex I bedrock and stony reef, as previously delineated).

As ADCP work was a bad weather contingency option, all ADCP data collection took place when weather and sea conditions disrupted Drop Frame sampling operations.

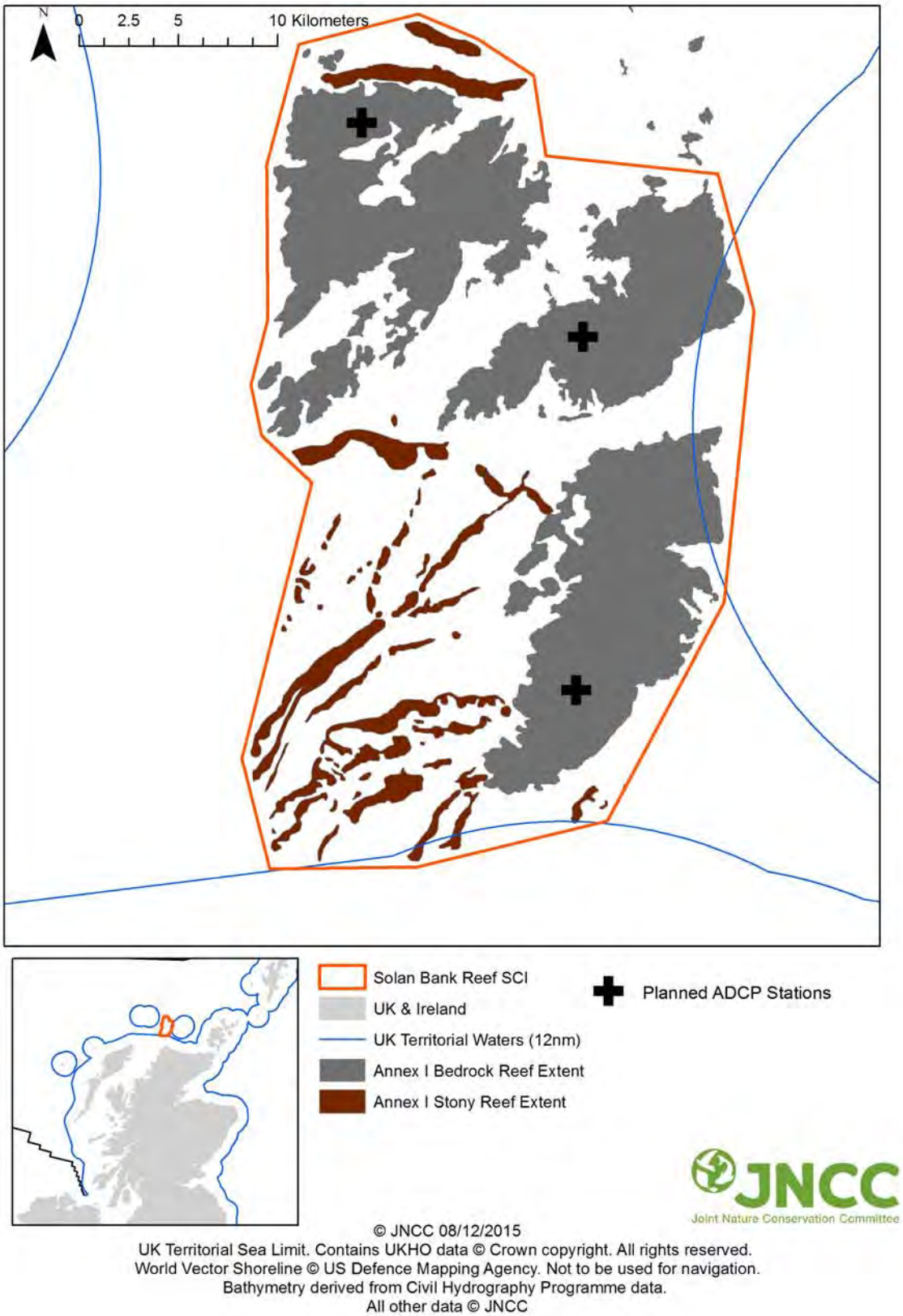


Figure 5. Contingency stations identified for ADCP deployment to measure bottom current flow rate and direction.

4 Methods

4.1 Drop Frame transects

A Drop Frame (Figure 3) was used for seabed imagery transect data collection.

The following instruments were mounted on the Drop Frame:

- Drop Down Video (DDV) system;
- Seabird 19plus self-contained CTD logger together with a combined chlorophyll fluorometer and transmissometer; and
- Sonar Scout Ultra-Short Base Line (USBL) acoustic transponder

The Drop Frame was deployed off the stern of the Scotia using a Marine Scotland Science (MSS) polyurethane cable.

Drop Frame transects were undertaken for a minimum of 10 minutes, sampling a minimum distance of 150m.

Figure 6. Drop Frame used on 1714S Solan Bank Reef SCI survey.

4.1.1 Drop Down Video (DDV) camera system

Underwater photographs and video data were captured using a seabed imagery system mounted on a Drop Frame.

The DDV system supported the following instruments:

- SubC 1 Alpha video camera (recorded HD video internally).
- Standard definition Kongsberg OE 14-408 digital camera (10MP) with dedicated flash unit for still images capture (camera controlled topside, images recorded internally).
- Kongsberg 14-366 colour TV camera for primary TV observation and topside recording to mini-DV tape and DVD.
- Four SEALED lamps for illumination.
- Four reference fan lasers (green).

Set-up and operation followed the MESH 'Recommended Operating Guidelines (ROG) for underwater video and photographic imaging techniques'[3]. A video overlay was used to provide time.

Field notes were made during each camera deployment, noting station and sample metadata, real-time observations of substrate and taxa, and an initial assessment of the potential sponge morphologies seen.

The station locations assigned represented the midpoints of each transect. During deployments, the vessel executed a controlled drift at ~ 0.3 knots through the specified station. The height of the Drop Frame off the seabed was controlled by winch; the operator had sight of the video monitor.

Still images were taken as regularly as possible (typically at 10-30s intervals). HD video and environmental data were acquired simultaneously and continuously.

The sampling approach applied on this survey was adapted for offshore DDV system use by JNCC from a dive survey methodology developed BY Haynes *et al* (2014) to examine options and assess approaches to the development of Marine Strategy Framework Directive (MSFD) indicators for the determination of shallow sublittoral rock habitat status in respect of achievement of Good Environmental Status (GES).

On a dive survey, data would be collected from 1m^2 quadrat areas, with five quadrats being examined at each site (a site is defined as an area less than 50m^2). The number of each morphology type would be counted in each quadrat, along with the abundance of each anthozoan species present. The morphologies would be divided into appropriate pre-defined categories i.e. Arborescent, Encrusting, Flabellate, Globular, Massive, Papillate, Pedunculate, Repent, and Tubular, following Bell & Barnes (2001) (see Figure 7 below). Adaptation for offshore use consisted of:

- As above, five 'quadrats' were examined at each site (still images used in place of fixed quadrats).
- Sites have been redefined as 50m segments along transects, with a still/quadrat recorded every 10m (resulting in 5 quadrats at each site).
    - This equated to one still per minute (assuming the ship moves at an average of ~0.3 knots, as is advised by the underwater video MESH ROG (Coggan *et al* 2007))
- Additional stills were taken where possible (e.g. when the camera is at an advantageous height and/or a feature of interest is observed)

[3] Coggan, R., Mitchell, A., White, J. and Golding, N. (2007) Recommended operating guidelines (ROG) for underwater video and photographic imaging techniques. MESH Project guideline document. Online: http://www.searchmesh.net/pdf/GMHM3_Video_ROG.pdf.

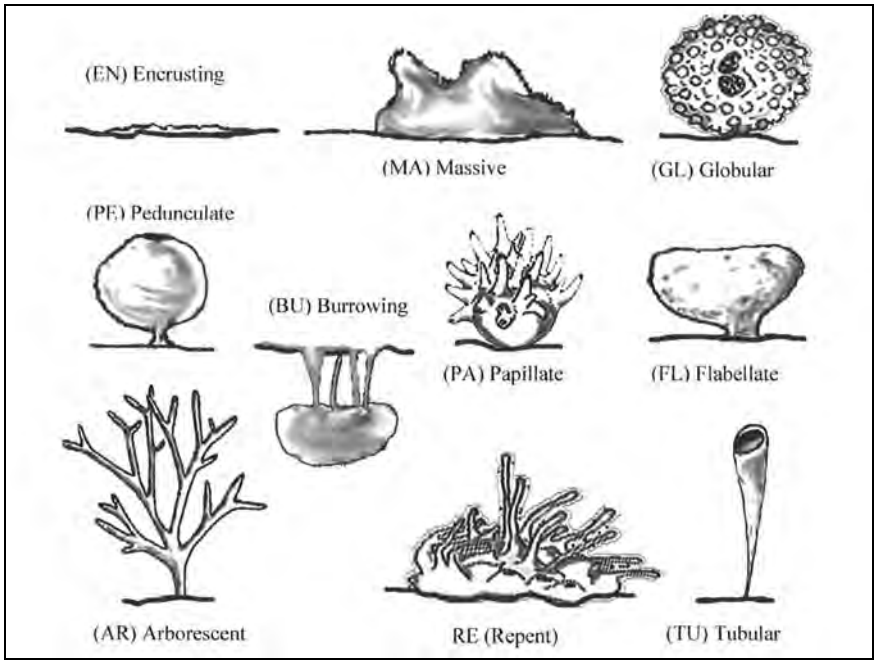


Figure 7. Sponge morphotypes (Berman *et al* 2012, after Bell *et al* 2006).

4.1.2 CTD logger with fluorometer and transmissometer

The Seabird 19plus self-contained CTD logger and combined chlorophyll fluorometer and a beam transmissometer (turbidity sensor) were placed across the frame to allow greatest flow over sensors.

The following environmental parameters were measured:

- Pressure.
- Conductivity.
- Temperature.
- Turbidity.
- Chlorophyll.

The Seabird 19plus CTD logger system was activated on deck immediately prior to Drop Frame deployment, allowing the vertical profile through the water column and horizontal profile along the camera transect to be sampled.

CTD and turbidity data were collected according to manufacturers recommended operating procedures (http://www.seabird.com/sbe911plus-ctd, see Documents, http://www.wetlabs.com/sites/default/files/documents/C-Star-Rev-V-Manual.pdf).

Data were logged at 1s intervals.

Surface water samples were obtained during Drop Frame deployments at appropriate stations. Samples were processed in the thermosalinagraph, with results used to validate CTD measurements. On site calibration was not required (Slesser 2014 *pers comm*). Data were downloaded from the instruments whilst topside at appropriate intervals before being checked and backed up.

4.1.3 Sonar Scout Ultra-Short Base Line (USBL) acoustic transponder

A Sonar Scout USBL acoustic transponder was fitted to the Drop Frame.

The Sonar Scout calculates the position of a subsea target (in this case the Drop Frame) by measuring the range and bearing from a vessel mounted transceiver (on the drop keel) to a small acoustic transponder fitted to the target; a technique known as Ultra-Short BaseLine (USBL) positioning.

USBL positional data was processed on board by MSS scientists.

USBL positions have been applied to Drop Frame data, where available (see **10.1**).

4.2 Acoustic Doppler Current Profiler (ADCP)

A vessel mounted Acoustic Doppler Current Profiler (ADCP) was utilised to measure seafloor current direction and speed.

As Solan Bank Reef SCI is tidally influenced, velocity measurements were collected for a time period longer than an M2 tidal cycle (i.e. longer than 12.42 hours) to ensure measurements of the highest and lowest velocities and direction of flood and ebb currents during the tidal cycle were captured.

ADCP measurements were collected while the Scotia held station within a 1nm ring.

The internal clock of the CTD logger was synchronised with GPS time and camera equipment time to enable time stamp geo-referencing of all measurements.

Sample metadata was recorded for each ADCP deployment.

5 Cruise Narrative

The MRV Scotia (hereafter “Scotia”) mobilised for the 1714S offshore seabed survey in Aberdeen Harbour from 23 - 28 October 2014.

JNCC and MSS scientists joined Scotia on Monday 27 October 2014.

Scotia departed Aberdeen Harbour for Solan Bank Reef SCI at 06:45 on Tuesday 28 October 2014. During the transit, a ship’s induction was carried out at 09:00, with a safety drill (general muster) following at 10:30. Drop frame mounted equipment were successfully deployed and ‘wet tested’ in the Southern Trench, off the north-east Scottish coast, from 12:15 to 13:15. A toolbox talk, led by SIC Mike Robertson, was held between JNCC and MSS scientists and the captain (Iain Campbell) at 14:00 on Tuesday 28 October 2014.

An error in station coordinate conversion resulted in Scotia continuing its transit 1° further west than the first sampling station. The error was realised and resolved at 10:00 on Wednesday 29 October 2014, and the correct coordinates inputted into the ships navigation system.

Scotia arrived on the first station (bedrock Targeted Station **TS30**) at Solan Bank Reef SCI at 14:00 on Wednesday 29 October 2014 and began Drop Frame sampling operations.

The bow thruster was found not to be working at 14:15 on Wednesday 29 October 2014; this did not affect sampling operations.

Drop Frame sampling operations were suspended at 05:30 on Thursday 30 October 2014 to repair a faulty hydraulic hose; the hose was repaired at 06:15 on Thursday 30 October 2014 and sampling continued.

On Friday 31 October 2014 the Seabird 19 CTD was found to be logging erratically at some stations (i.e. partially or not logging data; see **8.3 Drop Frame CTD Results**).

The final bedrock Targeted Station identified (**TS42**) was successfully completed at 21:57 on Friday 31 October 2014. Sampling continued at the stony reef Targeted Stations identified, beginning at Station **TS93** at 22:34 on Friday 31 October 2014.

Drop Frame sampling operations were suspended at 06:45 on Saturday 1 November 2014 due to inclement weather conditions rendering drop frame operations unsafe. ADCP sampling began at **ADCP2** at 18:45 on Saturday 1 November 2014, as the weather had not improved sufficiently to allow resumption of Drop Frame sampling. ADCP sampling was successfully completed at **ADCP2** at 08:00 on Sunday 2 November 2014. Scotia then waited for weather conditions to improve to recommence Drop Frame sampling; weather had not improved by 18:30 on Sunday 2 2014 so ADCP sampling was begun at **ADCP3**. ADCP sampling at **ADCP3** was aborted at 01:00 on Monday 3 November 2014 as improved weather conditions rendered Drop Frame operations safe. Drop Frame sampling operations were resumed, beginning at 01:46 on Monday 3 November 2014 stony reef Targeted Station **TS77**[4].

Drop Frame sampling operations were suspended at 02:00 on Tuesday 4 November 2014 due to inclement weather conditions rendering drop frame operations unsafe. Following

[4] Please note that though Random Stratified Sampling stations were identified as higher priority to stony reef Targeted Stations in the Survey Plan, 18 stony reef Targeted Sampling stations were completed prior to sampling the Random Stratified Sampling stations to improve efficiency of sampling running order given weather downtime experienced

transit to **ADCP3**, ADCP sampling began at 03:00 on Tuesday 4 November 2014. ADCP sampling was successfully completed at **ADCP3** at 16:00 on Tuesday 4 November 2014.

Following transit to **ADCP4**, ADCP sampling began at 17:00 on Tuesday 4 November 2014.

ADCP sampling at **ADCP4** was aborted at 02:15 on Wednesday 5 November 2014 as improved weather conditions rendered Drop Frame operations safe. Following transit to Box B Random Stratified Station **RSS67,** Drop Frame sampling operations were resumed, beginning at 03:00 on Wednesday 5 November 2014. Drop Frame sampling operations were suspended from 04:45 to 10:00 on Wednesday 5 November 2014 as inclement weather rendered drop frame deployment unsafe. Drop Frame sampling operations were suspended from 15:30 to 17:30 on Wednesday 5 November 2014 to repair a faulty hydraulic hose. Drop Frame operations were suspended from 17:00 to 22:00 on Wednesday 5 November 2014 to repair a camera system fault.

Drop Frame sampling operations were suspended from 04:00 to 04:45 on Thursday 6 November 2014 as inclement weather rendered drop frame deployment unsafe. Drop Frame sampling operations were suspended at 06:00 on Thursday 6 November 2014 due to inclement weather conditions rendering drop frame operations unsafe. Following transit to **ADCP4**, ADCP sampling began at 07:30. ADCP sampling was successfully completed at **ADCP4** at 23:15 on Thursday 6 November 2014.

Following transit to Box B Random Stratified Station **RSS43**, Drop Frame sampling operations were resumed, beginning at 00:15 on Friday 7 November 2014. Drop Frame sampling operations were suspended from 02:15 to 04:00 on Friday 7 November 2014 as inclement weather rendered drop frame deployment unsafe.

The final Box B Random Stratified Station identified (**RSS36**) was successfully completed at 06:10 on Friday 7 November 2014. Sampling continued at the remaining stony reef Targeted Stations identified, beginning at stony reef Targeted Station **TS99**[5] at 08:18 on Friday 7 November 2014. The final stony reef Targeted Station identified (**TS80**) was successfully completed at 22:15 on Friday 7 November 2014. Drop Frame sampling operations were resumed at 23:15 on Friday 7 November 2014, following transit to Box C Random Stratified Station **RSS91**.

Drop Frame sampling operations ceased at 00:05 on Sunday 9 November 2014, and Scotia departed Solan Bank Reef SCI for Aberdeen Harbour.

Scotia arrived alongside in Aberdeen Harbour at 23:00 on Sunday 9 November 2014.

6 Variations to Survey Plan

It was not possible to complete all stations identified in the survey planning. This was due primarily to weather conditions rendering Drop Frame sampling operations unsafe at times during the survey. This decreased the time available on-site for data collection.

The Objectives set out in the ahead of the survey were continuously assessed against the time available on survey, resulting in the following variations to the plan.

[5] Please note that though Random Stratified Sampling stations were identified as higher priority to stony reef Targeted Stations in the Survey Plan, the remaining stony reef Targeted Sampling stations identified were completed prior to beginning RSS Box C stations to improve efficiency of sampling running order and coverage of site given, weather downtime experienced

6.1 Adaptations to Running Order

Station running order was adapted 'on the fly' by the JNCC Lead, to maximise sampling efficiency and site coverage in the time available.

The following sampling order was specified in the Survey Plan:

1. Dropframe Camera/CTD Targeted Sampling (**TS**) stations (**bedrock reef**)
2. Dropframe Camera/CTD Random Stratified Sampling (**RSS**) stations (**Boxes A, B and C**)
3. Dropframe Camera/CTD Targeted Sampling (**TS**) stations (**stony reef**)
4. Habitat Mapping Stations (**contingency**)
5. ADCP stations (**contingency**)

The following sampling order was completed on survey:

1. Dropframe Camera/CTD Targeted Sampling (**TS**) stations (**bedrock reef**)
2. **Subset of** Dropframe Camera/CTD Targeted Sampling (**TS**) stations (**stony reef**)
3. Dropframe Camera/CTD Random Stratified Sampling (**RSS**) stations (**Box B**)
4. **Remaining** Dropframe Camera/CTD Targeted Sampling (**TS**) stations (**stony reef**)
5. Dropframe Camera/CTD Random Stratified Sampling (**RSS**) stations (**Box C**)

Three ADCP stations were completed (and a further two attempted) during periods when Drop Frame sampling was suspended. Drop Frame sampling was suspended when weather and sea conditions rendered Drop Frame sampling operations unsafe. This was often for prolonged periods of time (e.g. >12hrs)[6].

6.2 Removal of Random Stratified Sampling (RSS) Box A

No stations were visited in RSS Box A (High Demersal Fishing Activity); this Box was removed as the demersal fishing activity suggested to have overlapped with the Annex I bedrock reef may be an artefact of the resolution of the fishing data grids rather than an accurate representation of activity occurring directly on the reef.

Different types of Annex I reef (upstanding/flat bedrock reef and boulder and cobble reef) vary in their level of accessibility (and hence vulnerability) to bottom towed fishing gears (MMO 2014). The topology of the bedrock reef in the Box A area of Solan Bank is such that activity from towed fishing gears is likely to be limited to patches of surrounding sediment.

[6] See 7 Cruise Narrative for further information

7 Preliminary Results

Please note that observations made in the Cruise Report represent preliminary field observations. These observations have not been subject to Quality Assurance procedures. This disclaimer should be included when referencing the Cruise Report.

7.1 Overview

166 Drop Frame and 3 ADCP stations were successfully sampled on the 1714S Solan Bank Reef SCI offshore seabed survey (Figure 8).

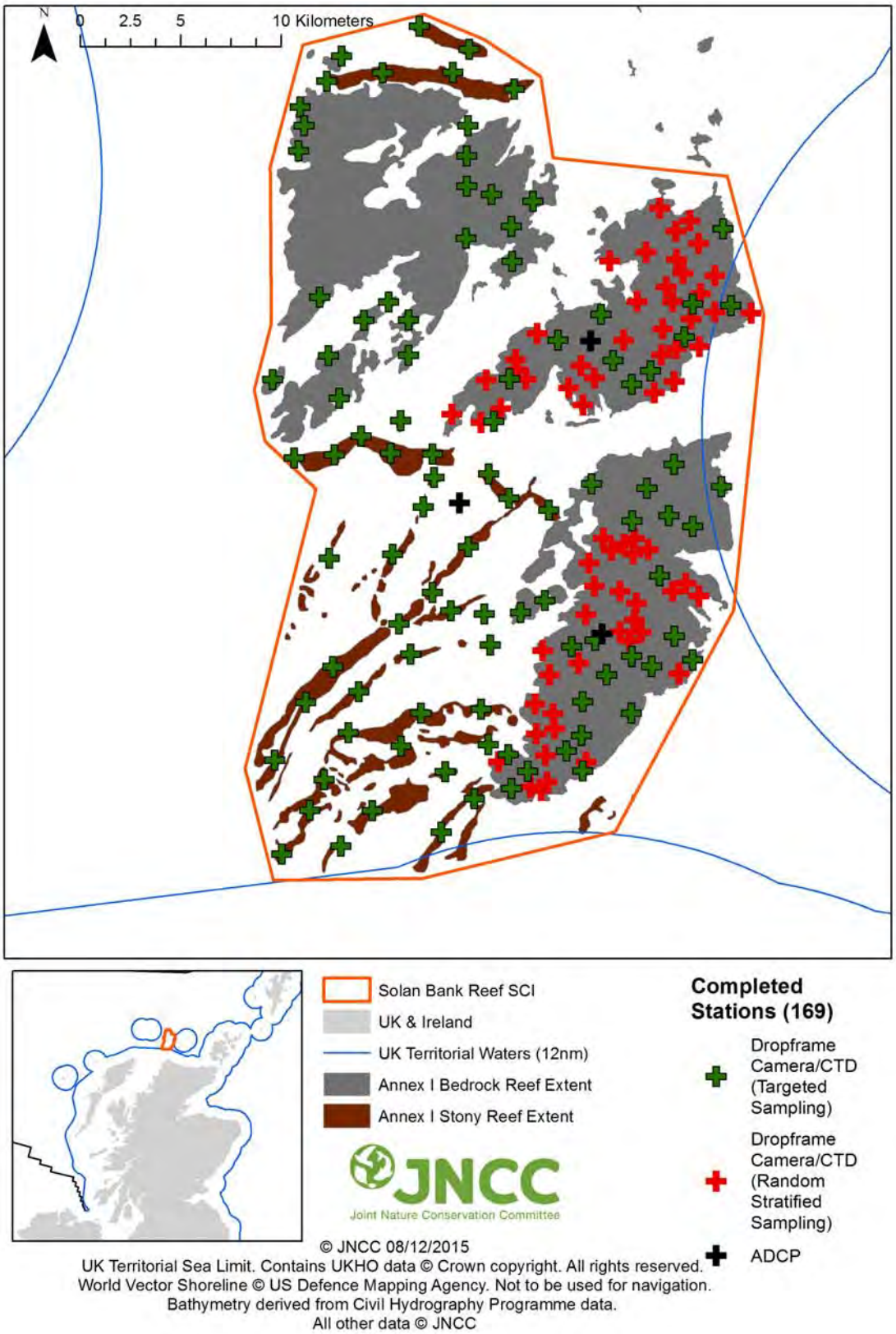


Figure 8. Summary of stations successfully sampled.

7.2 Drop Frame DDV

7.2.1 Completed Targeted Sampling Stations ('bedrock' and 'non reef')

High Definition (HD) video and stills imagery data were successfully collected from **50** Annex I bedrock reef stations and **one** non reef Targeted Sampling station (Figure 9).

7.2.2 Completed Targeted Sampling Stations (Annex I stony reef)

High Definition (HD) video and stills imagery data were successfully collected from **48** Annex I stony reef Targeted Sampling stations (Figure 10).

7.2.3 Completed Random Stratified Sampling Stations (Box B)

High Definition (HD) video and stills imagery data were successfully collected from **35** Box B Random Stratified Sampling stations (Figure 11).

7.2.4 Completed Random Stratified Sampling Stations (Box C)

High Definition (HD) video and stills imagery data were successfully collected from **32** Box C Random Stratified Sampling stations (Figure 12).

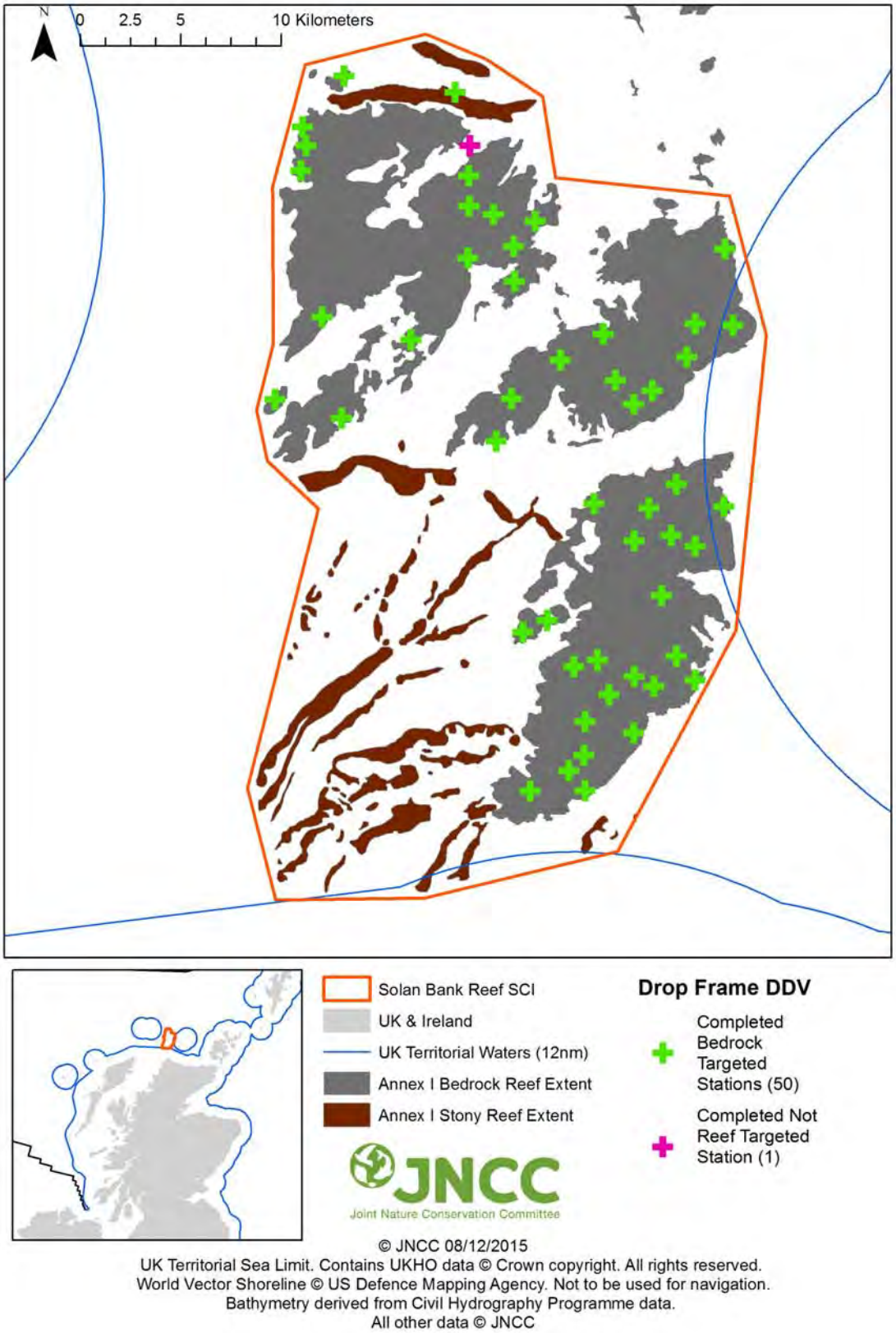


Figure 9. Completed 'bedrock' and 'non reef' Targeted Sampling Stations.

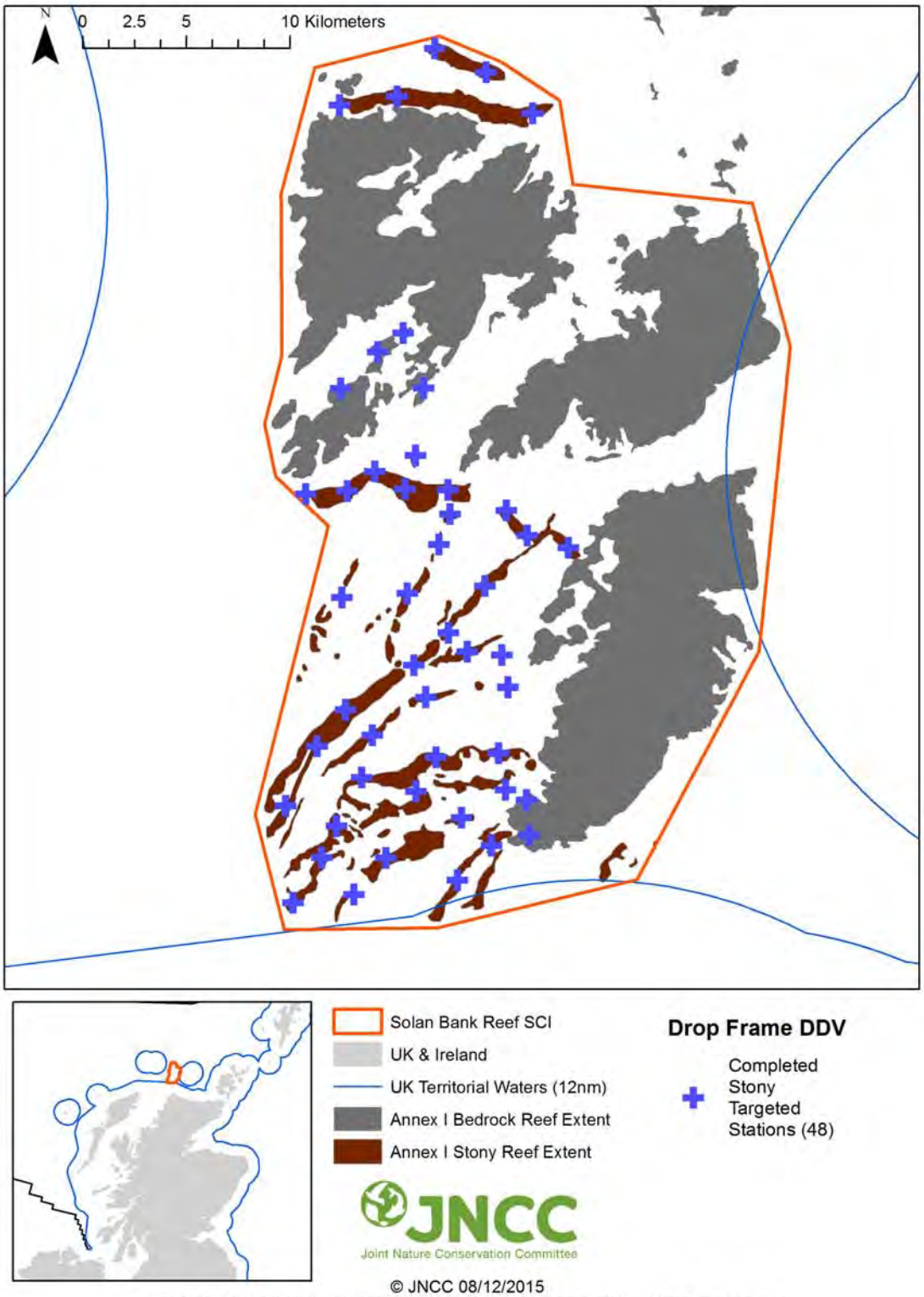


Figure 10. Completed 'stony reef' Targeted Sampling Stations.

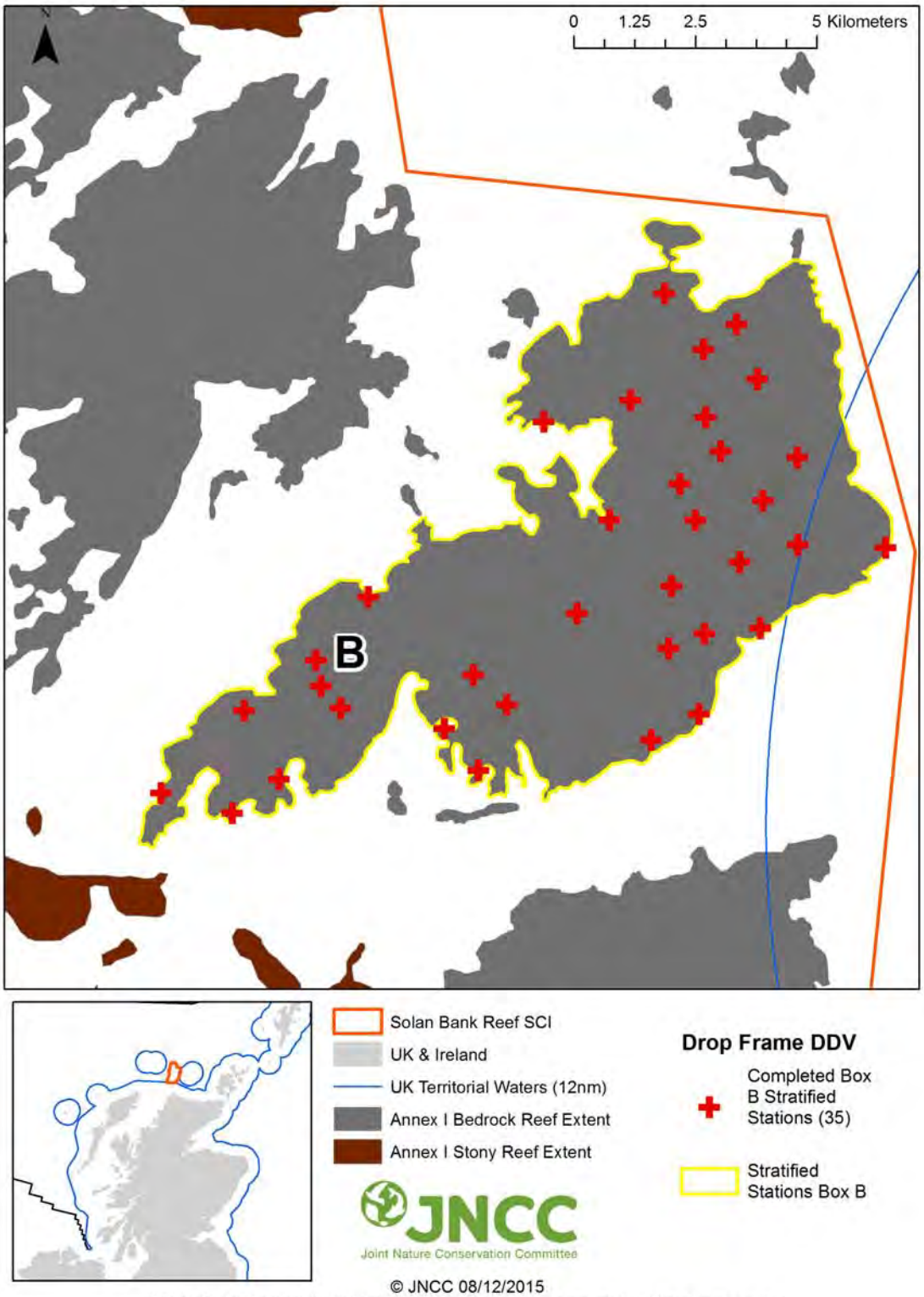


Figure 11. Completed 'Box B' Random Stratified Sampling Stations.

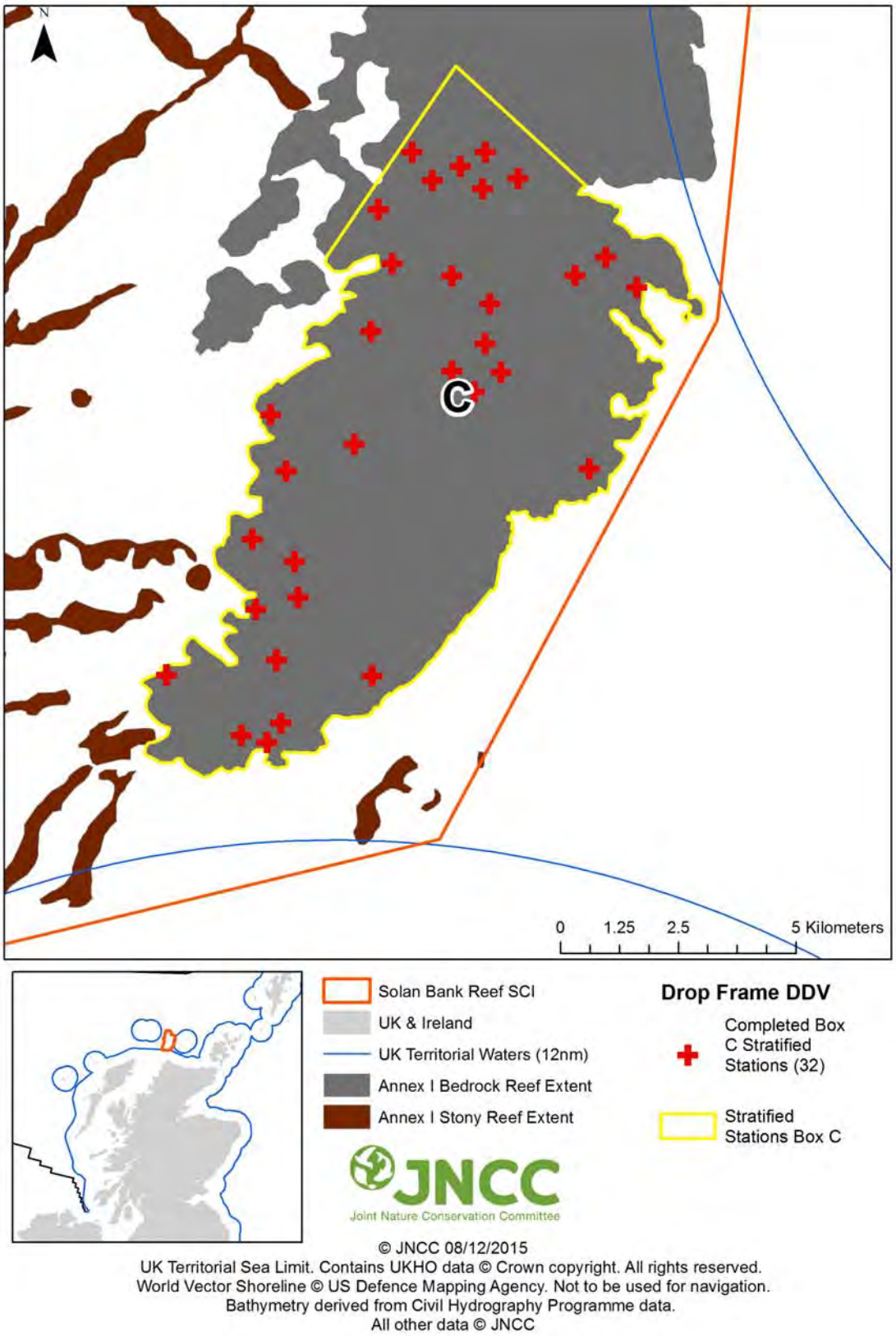


Figure 12. Completed Box C Random Stratified Sampling Stations.

7.3 Representative stills for each camera transect

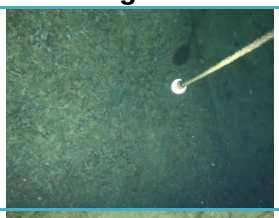
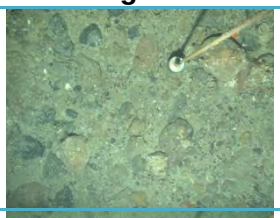
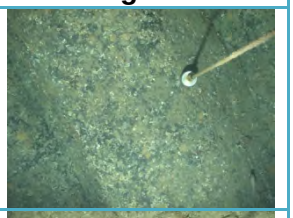
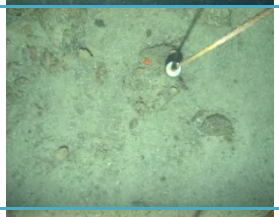
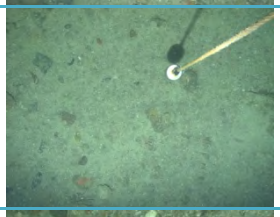
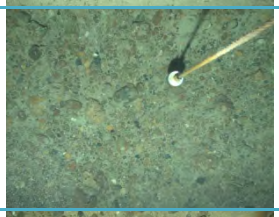
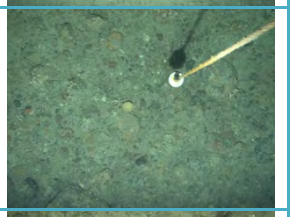
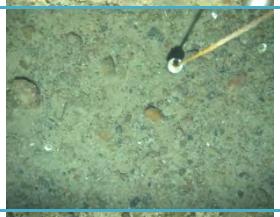
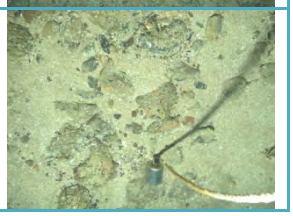
Please note that presence/absence of Sponge Morphotypes is based on preliminary field observations and has not been Quality Assured.

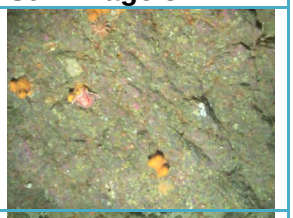
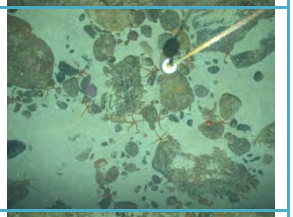
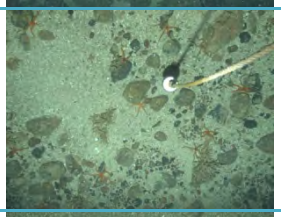
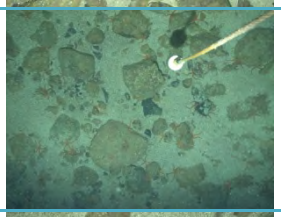
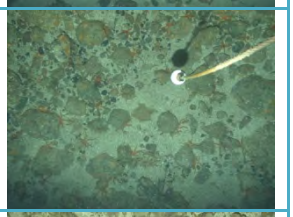
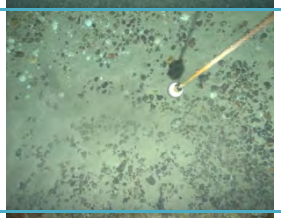
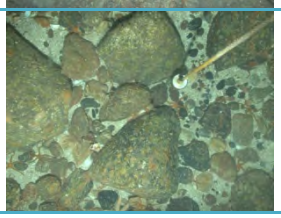
Weight and line visible in still images are suspended from Drop Frame to allow operator assess distance of Drop Frame from seabed.

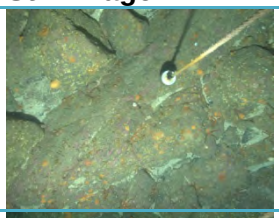
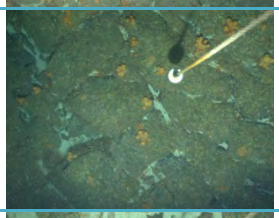
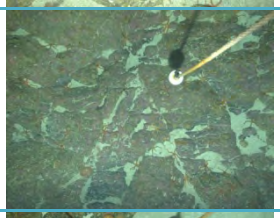
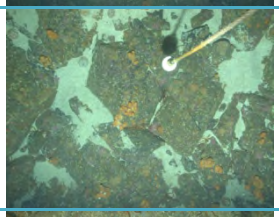
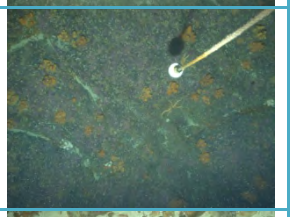
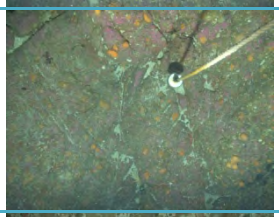
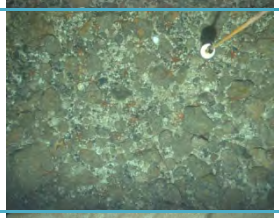
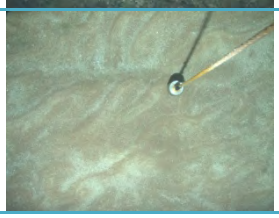
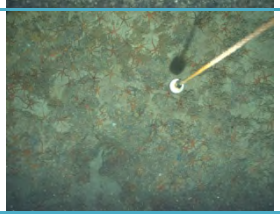
Sponge Morphotype (√) indicates a sponge morphotype has potentially been observed in situ during data collection.

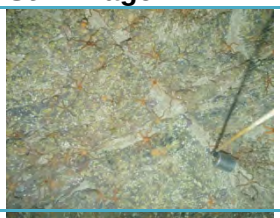
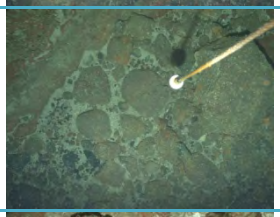
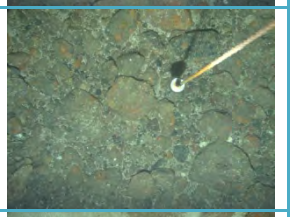
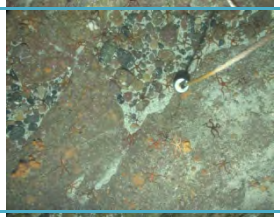
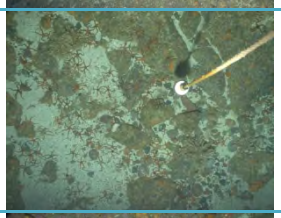
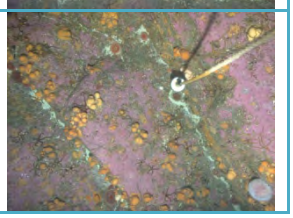
Sponge Morphotype (×) indicates a sponge morphotype has not been observed in situ during data collection.

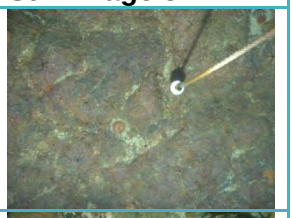
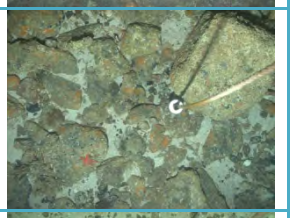
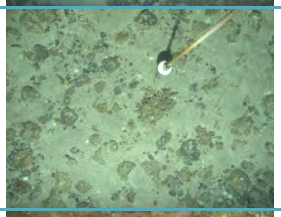
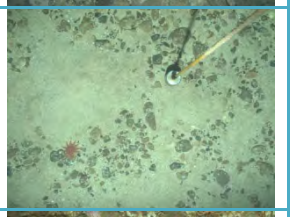
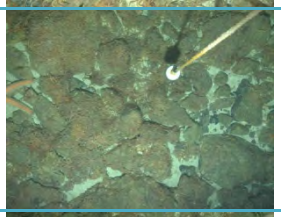
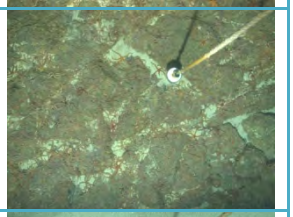
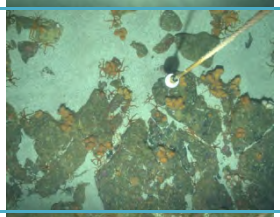
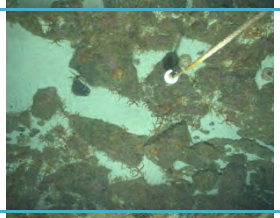
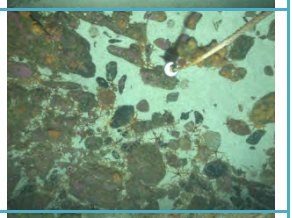
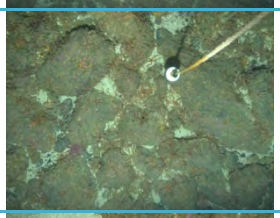
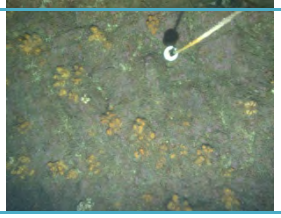
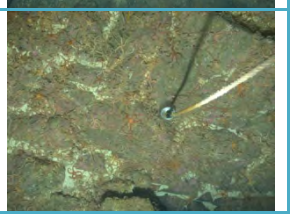
Table 2. Targeted Sample Stations: bedrock.

Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_TS30_S1 ***Sponge Morphotype?*** √			
1714S_SBR_TS31_S2 ***Sponge Morphotype?*** √			
1714S_SBR_TS29_S3 ***Sponge Morphotype?*** √			
1714S_SBR_TS28_S5 ***Sponge Morphotype?*** √			
1714S_SBR_TS44_S9 ***Sponge Morphotype?*** √			
1714S_SBR_TS17_S12 ***Sponge Morphotype?*** √			

Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_TS18_S13 ***Sponge Morphotype?*** √			
1714S_SBR_TS19_S14 ***Sponge Morphotype?*** √			
1714S_SBR_TS12_S15 ***Sponge Morphotype?*** √			
1714S_SBR_TS43_S16 ***Sponge Morphotype?*** √			
1714S_SBR_TS14_S17 ***Sponge Morphotype?*** √			
1714S_SBR_TS13_S18 ***Sponge Morphotype?*** √			
1714S_SBR_TS32_S19 ***Sponge Morphotype?*** ×			
1714S_SBR_TS33_S20 ***Sponge Morphotype?*** √			
1714S_SBR_TS58_S21 ***Sponge Morphotype?*** √			

Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_TS11_S22 ***Sponge Morphotype?*** √			
1714S_SBR_TS49_S23 ***Sponge Morphotype?*** √			
1714S_SBR_TS48_S24 ***Sponge Morphotype?*** √			
1714S_SBR_TS41_S25 ***Sponge Morphotype?*** √			
1714S_SBR_TS56_S26 ***Sponge Morphotype?*** √			
1714S_SBR_TS57_S27 ***Sponge Morphotype?*** √			
1714S_SBR_TS34_S28 ***Sponge Morphotype?*** √			
1714S_SBR_TS35_S29 ***Sponge Morphotype?*** √			
1714S_SBR_TS40_S30 ***Sponge Morphotype?*** √			

Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_TS10_S31 ***Sponge Morphotype?*** √			
1714S_SBR_TS50_S32 ***Sponge Morphotype?*** √			
1714S_SBR_TS51_S33 ***Sponge Morphotype?*** √			
1714S_SBR_TS36_S34 ***Sponge Morphotype?*** √			
1714S_SBR_TS52_S35 ***Sponge Morphotype?*** √			
1714S_SBR_TS53_S36 ***Sponge Morphotype?*** √			
1714S_SBR_TS9_S37 ***Sponge Morphotype?*** √			
1714S_SBR_TS46_S38 ***Sponge Morphotype?*** √			
1714S_SBR_TS07_S39 ***Sponge Morphotype?*** √			

Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_TS05_S40 ***Sponge Morphotype?*** √			
1714S_SBR_TS03_S41 ***Sponge Morphotype?*** √			
1714S_SBR_TS02_S42 ***Sponge Morphotype?*** √			
1714S_SBR_TS55_S43 ***Sponge Morphotype?*** √			
1714S_SBR_TS06_S44 ***Sponge Morphotype?*** √			
1714S_SBR_TS04_S45 ***Sponge Morphotype?*** √			
1714S_SBR_TS08_S46 ***Sponge Morphotype?*** √			
1714S_SBR_TS54_S47 ***Sponge Morphotype?*** √			
1714S_SBR_TS45_S48 ***Sponge Morphotype?*** √			

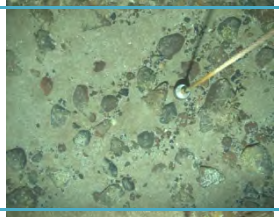
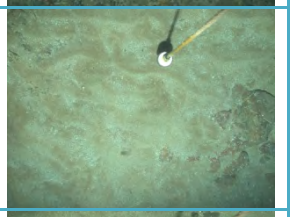
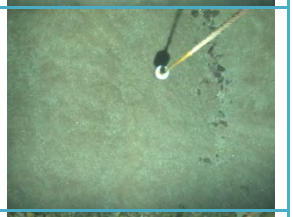
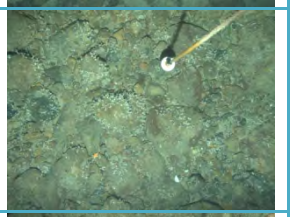
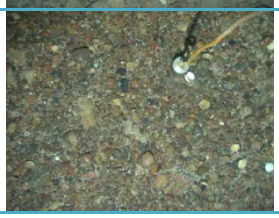
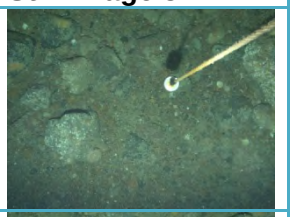
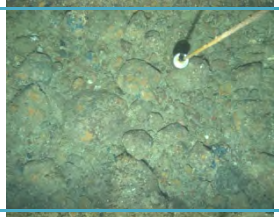
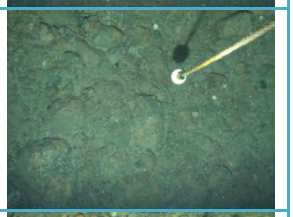
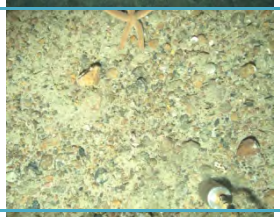
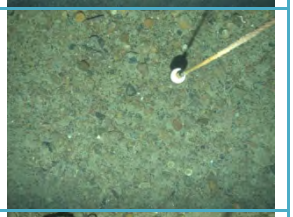
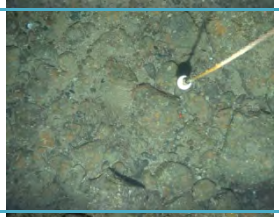
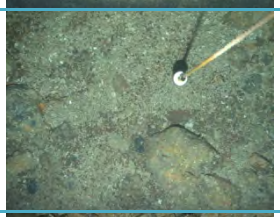
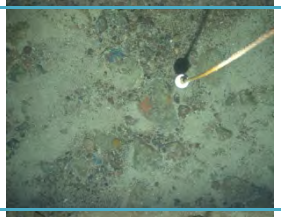
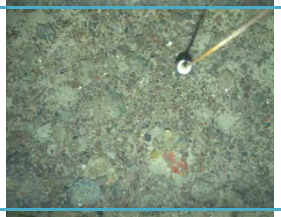
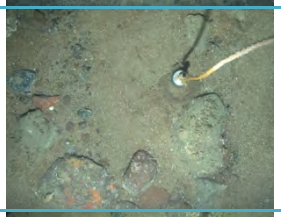
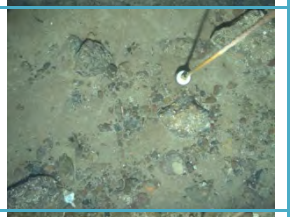
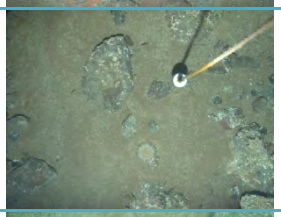
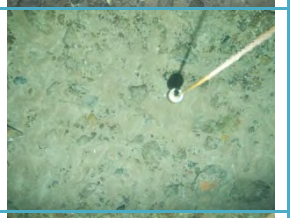
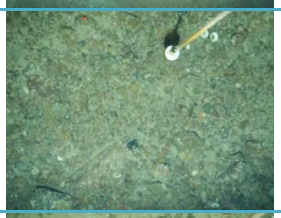
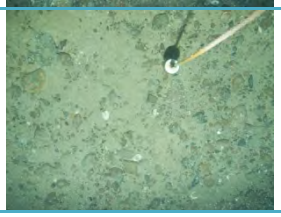
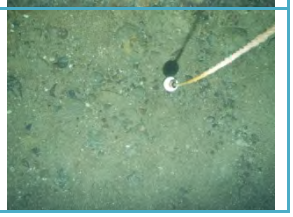
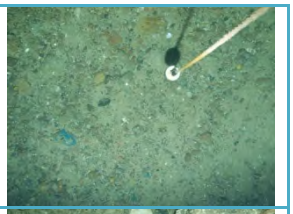
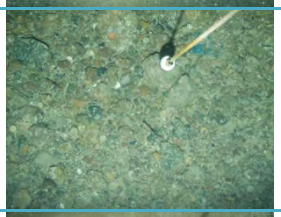
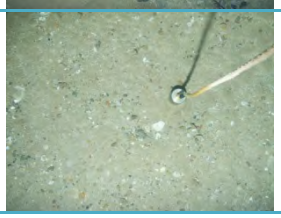
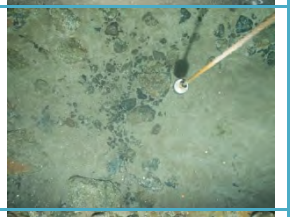
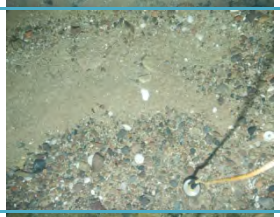
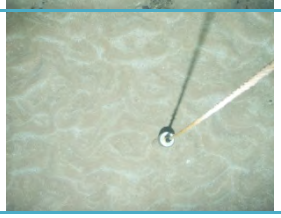
Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_TS39_S49 ***Sponge Morphotype?*** √			
1714S_SBR_TS37_S50 ***Sponge Morphotype?*** √			
1714S_SBR_TS23_S51 ***Sponge Morphotype?*** √			
1714S_SBR_TS22_S52 ***Sponge Morphotype?*** √			
1714S_SBR_TS47_S53 ***Sponge Morphotype?*** √			
1714S_SBR_TS38_S54 ***Sponge Morphotype?*** √			
1714S_SBR_TS26_S55 ***Sponge Morphotype?*** √			
1714S_SBR_TS42_S56 ***Sponge Morphotype?*** √			

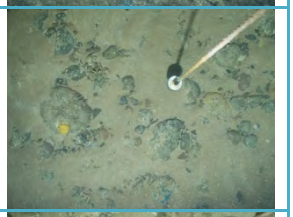
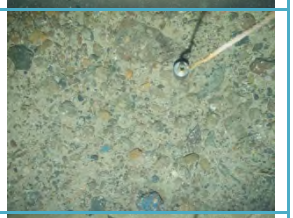
Table 3. Targeted Sampling Stations: stony reef.

Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_TS101_S4 ***Sponge Morphotype?*** √			
1714S_SBR_TS59_S6 ***Sponge Morphotype?*** √			
1714S_SBR_TS60_S7 ***Sponge Morphotype?*** √			
1714S_SBR_TS27_S8 ***Sponge Morphotype?*** √			
1714S_SBR_TS15_S10 ***Sponge Morphotype?*** √			
1714S_SBR_TS93_S57 ***Sponge Morphotype?*** √			
1714S_SBR_TS85_S58 ***Sponge Morphotype?*** √			
1714S_SBR_TS98_S59 ***Sponge Morphotype?*** √			

1714S_SBR_TS61_S60 ***Sponge Morphotype?*** √			
1714S_SBR_TS62_S61 ***Sponge Morphotype?*** √			
1714S_SBR_TS63_S62 ***Sponge Morphotype?*** √			
1714S_SBR_TS97_S63 ***Sponge Morphotype?*** √			
1714S_SBR_TS73_S64 ***Sponge Morphotype?*** √			
1714S_SBR_TS67_S65 ***Sponge Morphotype?*** √			
1714S_SBR_TS77_S68 ***Sponge Morphotype?*** √			
1714S_SBR_TS75_S69 ***Sponge Morphotype?*** √			
1714S_SBR_TS74_S70 ***Sponge Morphotype?*** √			

1714S_SBR_TS71_S71 ***Sponge Morphotype?*** √			
1714S_SBR_TS70_S72 ***Sponge Morphotype?*** √			
1714S_SBR_TS69_S73 ***Sponge Morphotype?*** √			
1714S_SBR_TS76_S74 ***Sponge Morphotype?*** √			
1714S_SBR_TS100_S7 5 ***Sponge Morphotype?*** √			
1714S_SBR_TS68_S76 ***Sponge Morphotype?*** √			
1714S_SBR_TS24_S77 ***Sponge Morphotype?*** √			
1714S_SBR_TS66_S78 ***Sponge Morphotype?*** √			
1714S_SBR_TS65_S79 ***Sponge Morphotype?*** √			

1714S_SBR_TS96_S80 ***Sponge Morphotype?*** ×			
1714S_SBR_TS94_S81 ***Sponge Morphotype?*** √			
1714S_SBR_TS92_S82 ***Sponge Morphotype?*** √			
1714S_SBR_TS95_S83 ***Sponge Morphotype?*** √			
1714S_SBR_TS78_S84 ***Sponge Morphotype?*** ×			
1714S_SBR_TS64_S85 ***Sponge Morphotype?*** √			
1714S_SBR_TS99_S124 ***Sponge Morphotype?*** √			
1714S_SBR_TS89_S125 ***Sponge Morphotype?*** √			
1714S_SBR_TS88_S126 ***Sponge Morphotype?*** √			

1714S_SBR_TS86_S127 ***Sponge Morphotype?*** √			
1714S_SBR_TS87_S128 ***Sponge Morphotype?*** √			
1714S_SBR_TS84__S129 ***Sponge Morphotype?*** √			
1714S_SBR_TS83__S130 ***Sponge Morphotype?*** √			
1714S_SBR_TS82__S131 ***Sponge Morphotype?*** √			
1714S_SBR_TS72__S132 ***Sponge Morphotype?*** √			
1714S_SBR_TS81__S133 ***Sponge Morphotype?*** √			
1714S_SBR_TS1__S134 ***Sponge Morphotype?*** √			
1714S_SBR_TS103__S135 ***Sponge Morphotype?*** √			

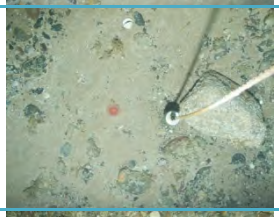
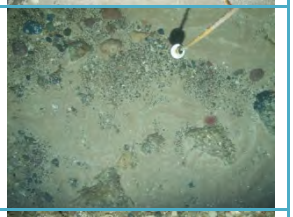
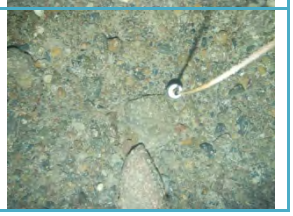
1714S_SBR_TS91__S136 ***Sponge Morphotype?*** √			
1714S_SBR_TS102__S137 ***Sponge Morphotype?*** √			
1714S_SBR_TS79__S138 ***Sponge Morphotype?*** √			
1714S_SBR_TS80__S139 ***Sponge Morphotype?*** √			

Table 4. Targeted Sampling Stations: Not reef.

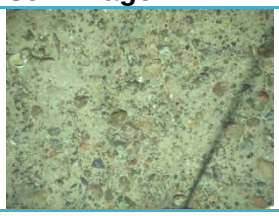
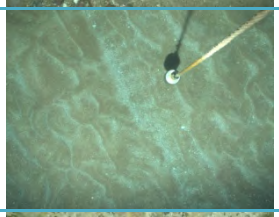
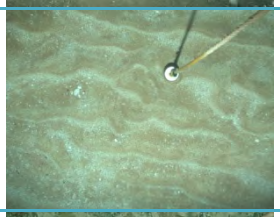
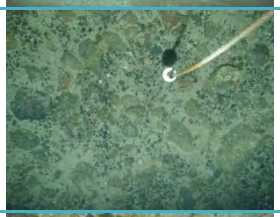
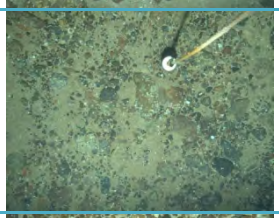
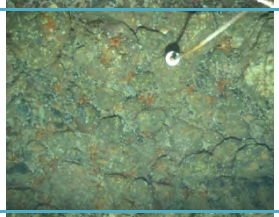
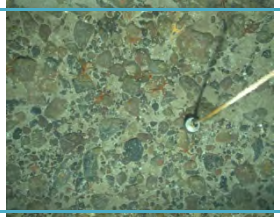
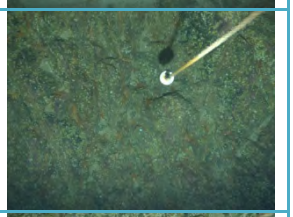
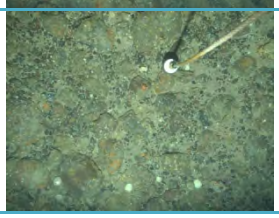
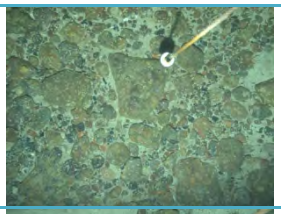
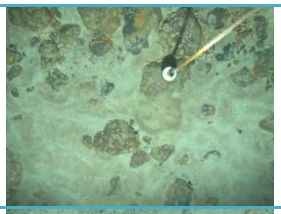
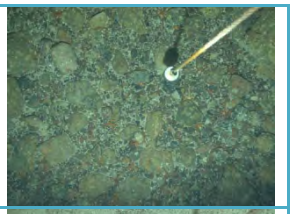
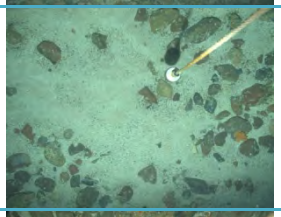
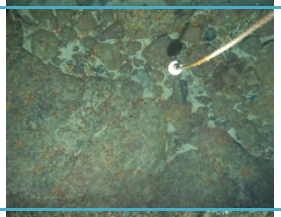
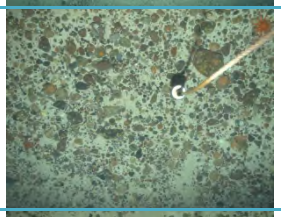
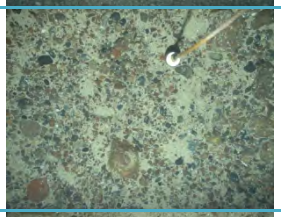
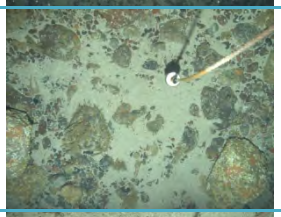
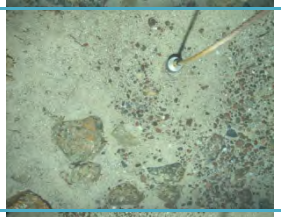
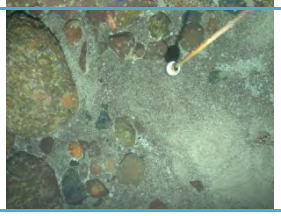
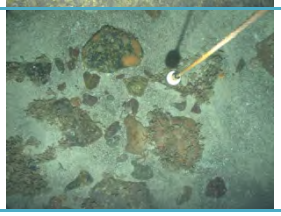
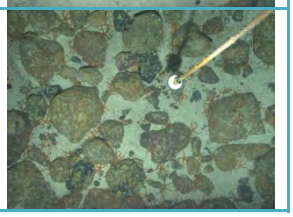
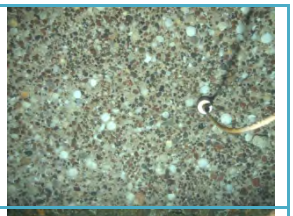
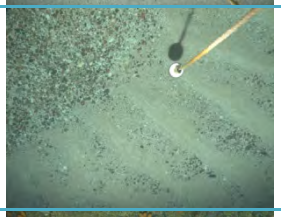
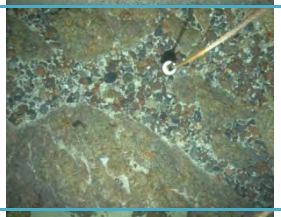
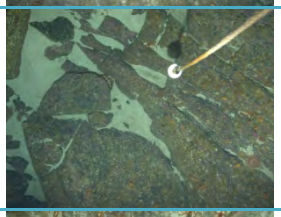
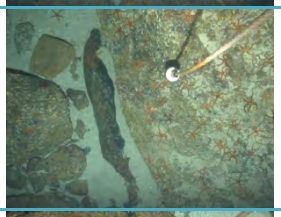
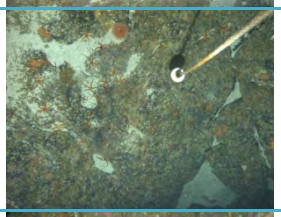
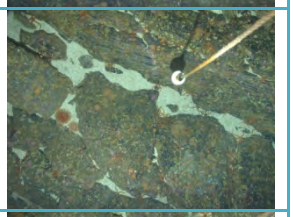
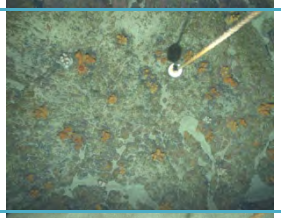
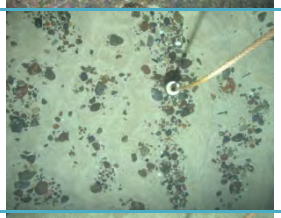
Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_TS16_S11 ***Sponge Morphotype?*** √			

Table 5. Random Stratified Sampling Stations (Box B).

Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_RSS69_S86 ***Sponge Morphotype?*** √			
1714S_SBR_RSS58_S87 ***Sponge Morphotype?*** ×			
1714S_SBR_RSS38_S88 ***Sponge Morphotype?*** √			
1714S_SBR_RSS50_S89 ***Sponge Morphotype?*** √			
1714S_SBR_RSS46_S90 ***Sponge Morphotype?*** √			
1714S_SBR_RSS57_S91 ***Sponge Morphotype?*** √			
1714S_SBR_RSS65_S92 ***Sponge Morphotype?*** √			
1714S_SBR_RSS40_S93 ***Sponge Morphotype?*** √			

1714S_SBR_RSS67_S96 ***Sponge Morphotype?*** √			
1714S_SBR_RSS53_S97 ***Sponge Morphotype?*** √			
1714S_SBR_RSS52_S98 ***Sponge Morphotype?*** √			
1714S_SBR_RSS70_S99 ***Sponge Morphotype?*** √			
1714S_SBR_RSS60_S100 ***Sponge Morphotype?*** √			
1714S_SBR_RSS59_S101 ***Sponge Morphotype?*** √			
1714S_SBR_RSS41_S102 ***Sponge Morphotype?*** √			
1714S_SBR_RSS54_S103 ***Sponge Morphotype?*** √			
1714S_SBR_RSS55_S104 ***Sponge Morphotype?*** √			

1714S_SBR_RSS39_S 105 ***Sponge Morphotype?*** √			
1714S_SBR_RSS47_S 106 ***Sponge Morphotype?*** √			
1714S_SBR_RSS63_S 107 ***Sponge Morphotype?*** √			
1714S_SBR_RSS68_S 108 ***Sponge Morphotype?*** √			
1714S_SBR_RSS48_S 109 ***Sponge Morphotype?*** √			
1714S_SBR_RSS61_S 110 ***Sponge Morphotype?*** √			
1714S_SBR_RSS66_S 111 ***Sponge Morphotype?*** √			
1714S_SBR_RSS44_S 112 ***Sponge Morphotype?*** √			
1714S_SBR_RSS56_S 113 ***Sponge Morphotype?*** √			

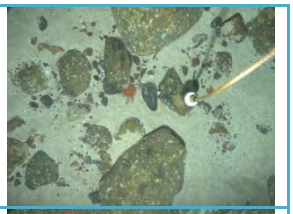
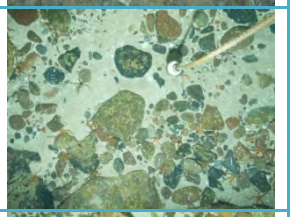
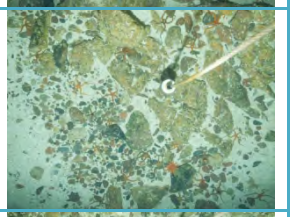
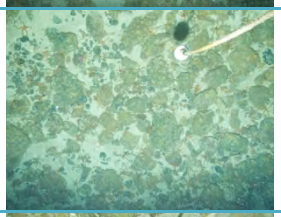
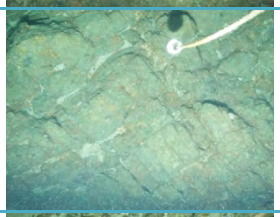
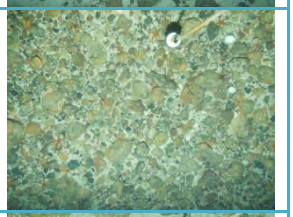
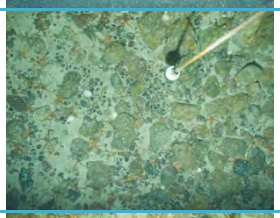
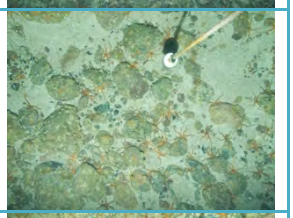
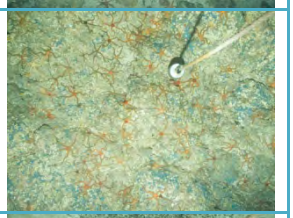
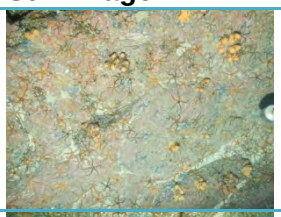
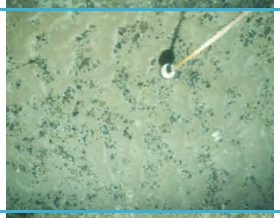
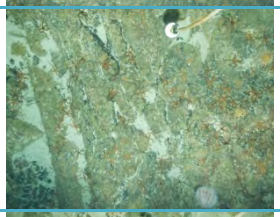
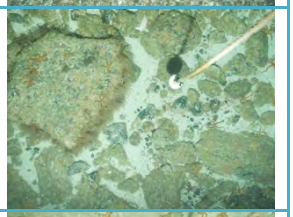
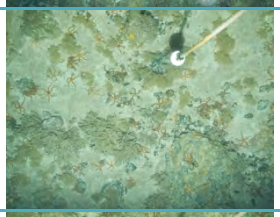
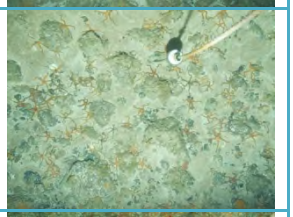
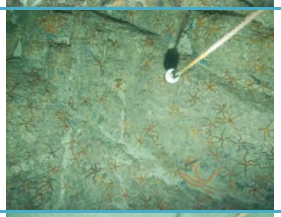
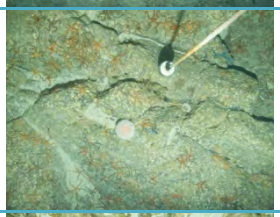
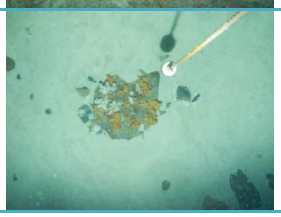
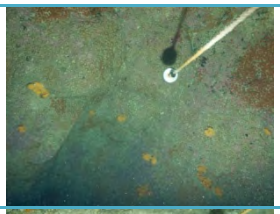
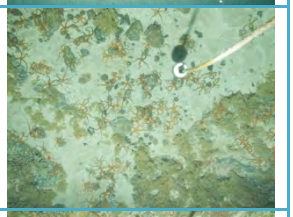
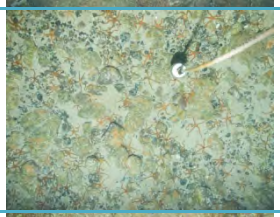
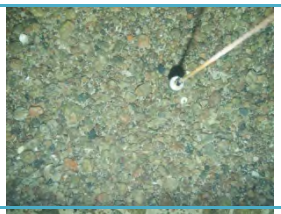
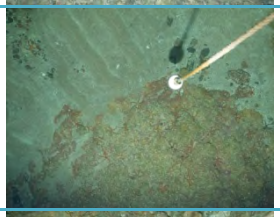
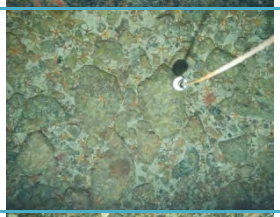
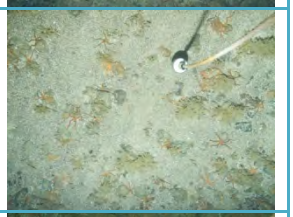
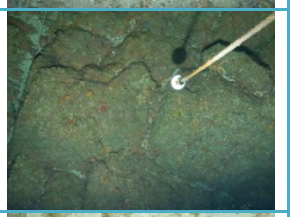
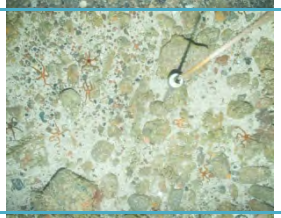
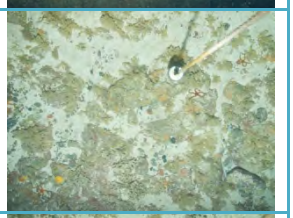
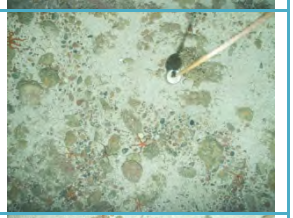
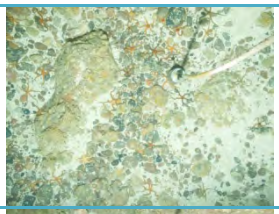
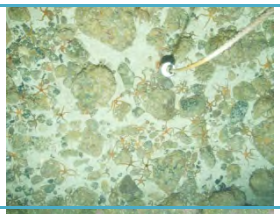
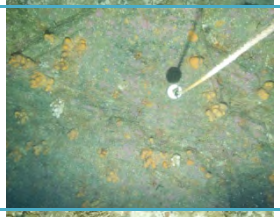
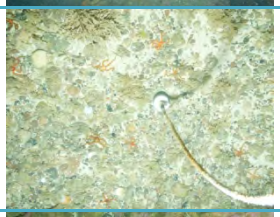
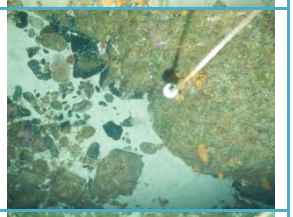
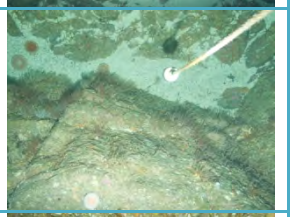
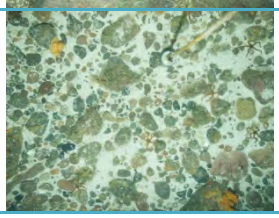
1714S_SBR_RSS42_S 114 ***Sponge Morphotype?*** √			
1714S_SBR_RSS62_S 115 ***Sponge Morphotype?*** √			
1714S_SBR_RSS49_S 116 ***Sponge Morphotype?*** √			
1714S_SBR_RSS43_S 118 ***Sponge Morphotype?*** √			
1714S_SBR_RSS51_S 119 ***Sponge Morphotype?*** √			
1714S_SBR_RSS37_S 120 ***Sponge Morphotype?*** √			
1714S_SBR_RSS45_S 121 ***Sponge Morphotype?*** √			
1714S_SBR_RSS64_S 122 ***Sponge Morphotype?*** √			
1714S_SBR_RSS36_S 123 ***Sponge Morphotype?*** √			

Table 6. Random Stratified Sampling Stations (Box C).

Station Code	Still Image 1	Still Image 2	Still Image 3
1714S_SBR_RSS91__ S140 ***Sponge Morphotype?*** √			
1714S_SBR_RSS101__ S141 ***Sponge Morphotype?*** √			
1714S_SBR_RSS98__ S142 ***Sponge Morphotype?*** √			
1714S_SBR_RSS91__ S143 ***Sponge Morphotype?*** √			
1714S_SBR_RSS77__ S144 ***Sponge Morphotype?*** √			
1714S_SBR_RSS95__ S145 ***Sponge Morphotype?*** √			
1714S_SBR_RSS105__ S146 ***Sponge Morphotype?*** √			
1714S_SBR_RSS80__ S147 ***Sponge Morphotype?*** √			

1714S_SBR_RSS75__S148 ***Sponge Morphotype?*** √			
1714S_SBR_RSS81__S149 ***Sponge Morphotype?*** √			
1714S_SBR_RSS86__S150 ***Sponge Morphotype?*** √			
1714S_SBR_RSS99__S151 ***Sponge Morphotype?*** √			
1714S_SBR_RSS84__S152 ***Sponge Morphotype?*** √			
1714S_SBR_RSS97__S153 ***Sponge Morphotype?*** √			
1714S_SBR_RSS88__S154 ***Sponge Morphotype?*** √			
1714S_SBR_RSS92__S155 ***Sponge Morphotype?*** √			
1714S_SBR_RSS74__S156 ***Sponge Morphotype?*** √			

1714S_SBR_RSS83__S157 ***Sponge Morphotype?*** √			
1714S_SBR_RSS71__S158 ***Sponge Morphotype?*** √			
1714S_SBR_RSS89__S159 ***Sponge Morphotype?*** √			
1714S_SBR_RSS87__S160 ***Sponge Morphotype?*** √			
1714S_SBR_RSS102__S161 ***Sponge Morphotype?*** √			
1714S_SBR_RSS104__S162 ***Sponge Morphotype?*** √			
1714S_SBR_RSS103__S163 ***Sponge Morphotype?*** √			
1714S_SBR_RSS82__S164 ***Sponge Morphotype?*** √			
1714S_SBR_RSS96__S165 ***Sponge Morphotype?*** √			

1714S_SBR_RSS93__ S166 ***Sponge Morphotype?*** √			
1714S_SBR_RSS73__ S167 ***Sponge Morphotype?*** √			
1714S_SBR_RSS78__ S168 ***Sponge Morphotype?*** √			
1714S_SBR_RSS76__ S169 ***Sponge Morphotype?*** √			
1714S_SBR_RSS100__ S170 ***Sponge Morphotype?*** √			
1714S_SBR_RSS90__ S171 ***Sponge Morphotype?*** √			

7.4 Drop Frame CTD Results

Seabird 19plus self-contained CTD logger and combined chlorophyll fluorometer and beam transmissometer measurements were attempted at all Drop Frame stations.

Logging was partially successful or unsuccessful at 14 stations (see Table 7).

Logging was fully successful at all other Drop Frame stations.

Table 7. Partially successful and unsuccessful Drop Frame CTD stations.

Station	Fault
TS02	CTD ceased logging during cast (partial dataset collected)
TS16	CTD ceased logging during cast (partial dataset collected)
TS17	CTD ceased logging during cast (partial dataset collected)
TS36	No CTD data collected
TS42	Faulty transmissometer beam attenuation
TS63	CTD ceased logging during cast (partial dataset collected)
TS71	CTD ceased logging during cast (partial dataset collected)
TS80	CTD ceased logging during cast (partial dataset collected)
TS83	CTD ceased logging during cast (partial dataset collected)
TS84	CTD ceased logging during cast (partial dataset collected)
TS97	CTD ceased logging during cast (partial dataset collected)
RSS77	CTD ceased logging during cast (partial dataset collected)
RSS102	CTD ceased logging during cast (partial dataset collected)
RSS105	CTD ceased logging during cast (partial dataset collected)

7.5 ADCP Results

ADCP measurements >13 hours were successfully acquired at three stations (Figure 13).

ADCP sampling began but was prematurely aborted at two stations (see **7 Cruise Narrative**).

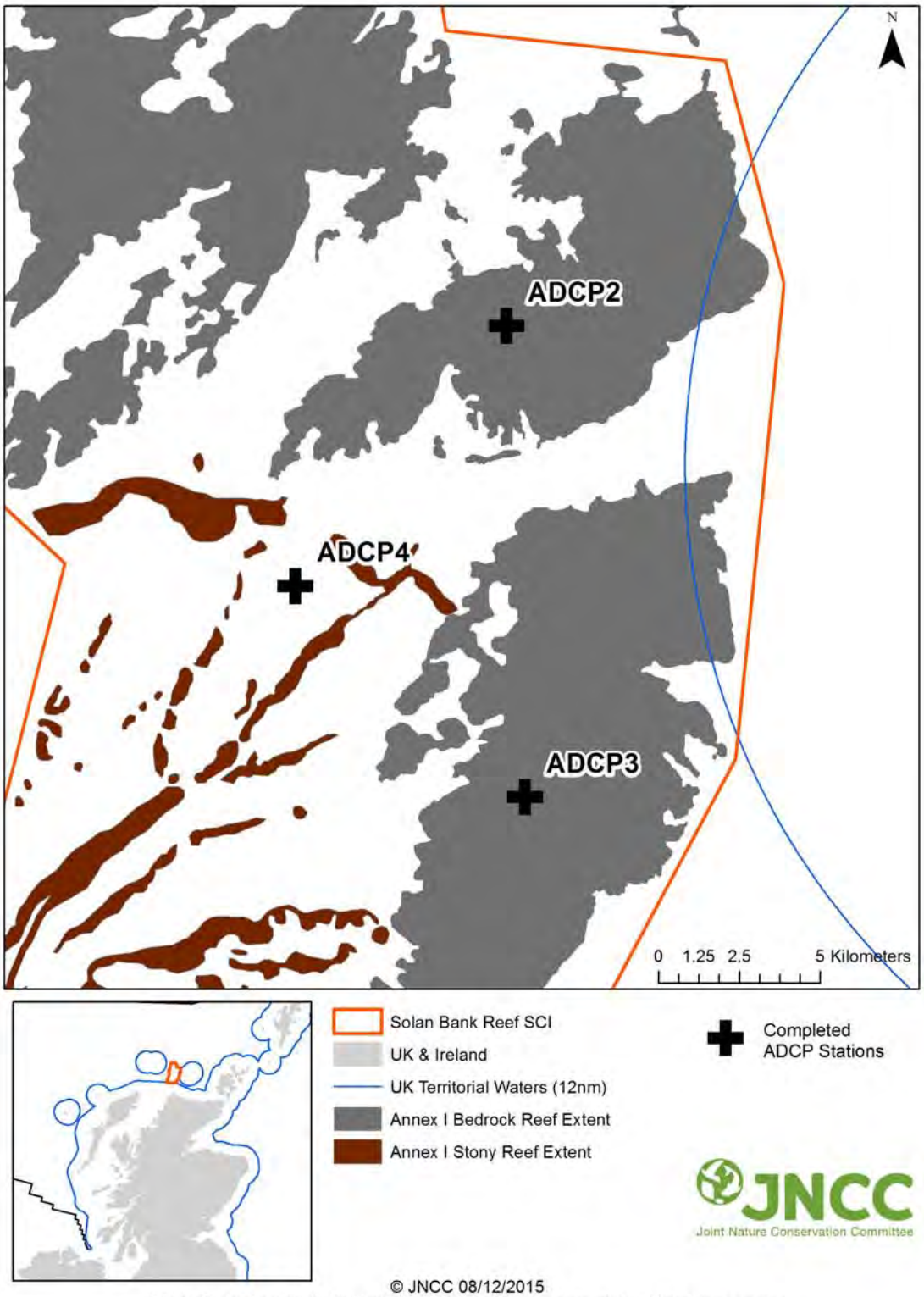


Figure 13. ADCP stations successfully completed.

8 Data Formats

Table 8 outlines the data formats collected on the 1714S survey.

Table 8. 1714S data formats.

Data Type	Raw Format	Converted To	Saved
High Definition Video	.m2ts	n/a	Electronically
Standard Definition Video	.vob	n/a	DVD, mini DV tape
Stills	.cr2	.jpeg	Electronically
CTD	.hex	.cnv	Electronically
ADCP	-	.xls	Electronically
USBL	.csv	.xls	Electronically

9 Quality Control (QC)

9.1 Positioning

A USB-Comms adaptor was used to link ArcGIS to the ship's GPS feed to record ship's position.

'Fixes' were recorded in ArcGIS for each still image taken by the camera.

A Sonardyne Scout Plus Ultra Short Baseline (USBL) system and DDV mounted Sonardyne Omni-directional Transponder were employed to obtain Drop Frame positioning.

Ships positioning has been linked to USBL positioning using time stamps recorded.

Length of cable paid out and depth were logged at the start and end of each deployment to enable layback to be used in case of USBL failure.

Layback has been calculated for the following positions, where USBL positions are not available:

Table 9. Layback positions calculated.

Station Name	Still number
1714S_SBR_TS29_S3	14
1714S_SBR_TS29_S3	15
1714S_SBR_TS47_S53	All
1714S_SBR_TS70_S72	1
1714S_SBR_TS70_S72	3
1714S_SBR_TS70_S72	4
1714S_SBR_TS70_S72	5
1714S_SBR_TS70_S72	6
1714S_SBR_RSS46_S90	1
1714S_SBR_RSS46_S90	2
1714S_SBR_RSS42_S114	1
1714S_SBR_RSS42_S114	2
1714S_SBR_RSS42_S114	3
1714S_SBR_RSS42_S114	4
1714S_SBR_RSS42_S114	5
1714S_SBR_RSS42_S114	6
1714S_SBR_RSS42_S114	7
1714S_SBR_RSS42_S114	8
1714S_SBR_RSS42_S114	9
1714S_SBR_RSS42_S114	10
1714S_SBR_RSS42_S114	11
1714S_SBR_RSS42_S114	12
1714S_SBR_RSS42_S114	13
1714S_SBR_RSS42_S114	14
1714S_SBR_RSS42_S114	15
1714S_SBR_RSS42_S114	16

1714S_SBR_RSS42_S114	17
1714S_SBR_RSS42_S114	18
1714S_SBR_RSS42_S114	19
1714S_SBR_RSS103_S163	1
1714S_SBR_RSS103_S163	2
1714S_SBR_RSS103_S163	3
1714S_SBR_RSS103_S163	4
1714S_SBR_RSS103_S163	5

9.2 Data Management

A data manager was assigned to each shift.

For details of on-board data management procedures please refer to the Data Management Plan (O'Connor 2014. Available on request from JNCC)

10 Human activity

Potential anthropogenic impacts were observed at four Drop Frame stations (Table 10 and Figure 14).

Table 10. Potential anthropogenic impacts observed (see Figure 14).

Station Name	Date	Time	Anthropogenic impact
1714S_SBR_**TS43**_S16	30/10/2014	05:05	Fishing net caught in weight
1714S_SBR_**TS74**_S70	03/11/2014	03:27	Trawl ring
1714S_SBR_**RSS36**_S123	07/11/2014	05:58	Apparent track marks; trawl ring
1714S_SBR_**RSS84**_S152	08/11/2014	09:11	Trawl warp/cable

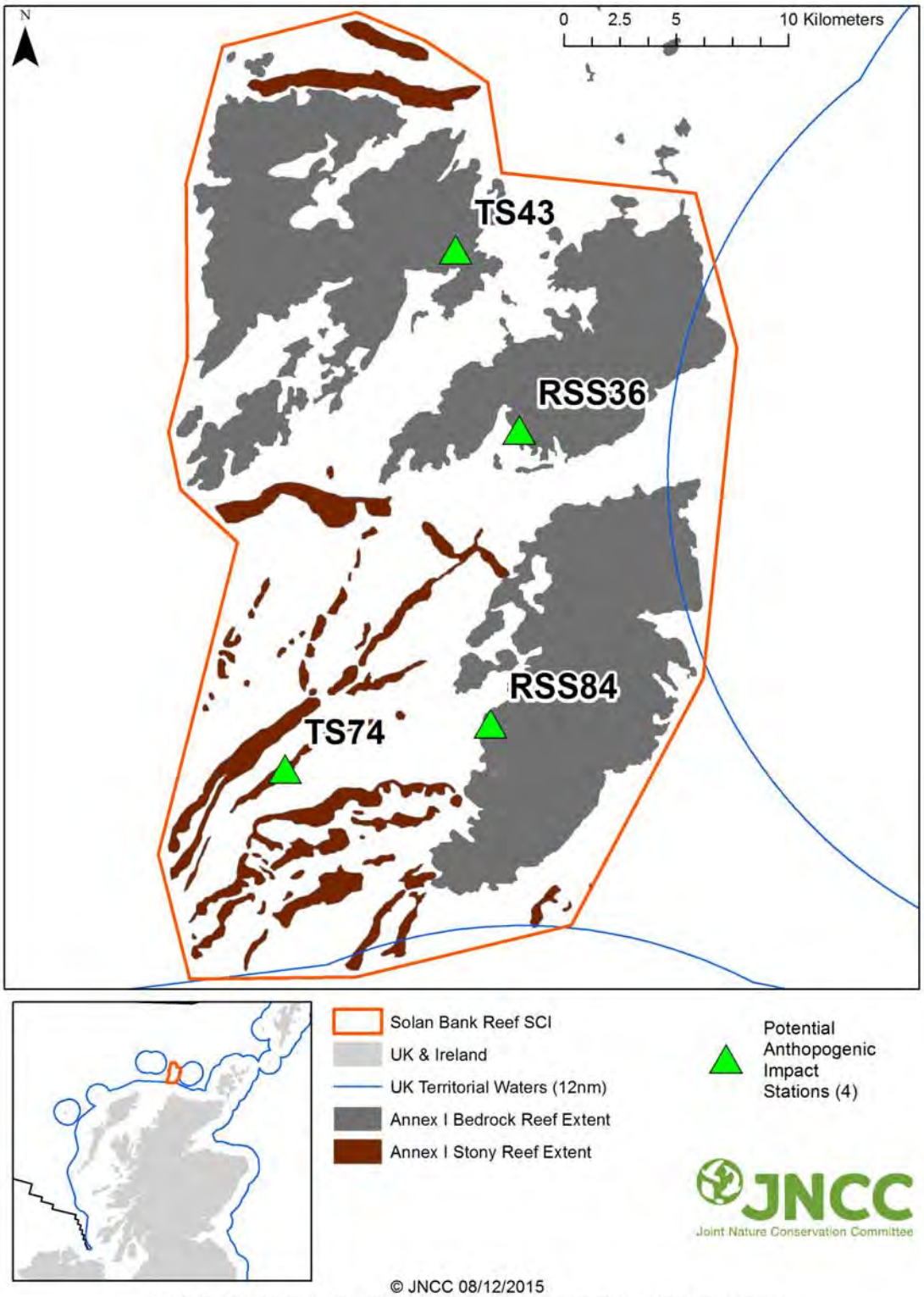


Figure 14. Potential anthropogenic impacts observed (see Table 10).

11 H&S events

No unplanned H&S events occurred.

Two safety drills were undertaken.

A ‘general muster’ was held at 10:30 on 28 October 2014.

A ‘man overboard’ drill took place at 10:00 on 9 November 2014

12 Intellectual Property Rights and confidentiality

Rights to all knowledge (including but not limited to data, information, know-how, designs, drawings and specifications) brought to the project by either party (JNCC or MSS) will remain with that party, and such knowledge is to be used solely for the purposes of conducting this project.

Rights to knowledge jointly generated within the project will be jointly owned by JNCC and MSS.

The project is publically funded and all knowledge generated within the project will be made publically available under Open Government Licence (http://www.nationalarchives.gov.uk/doc/open-government-licence/version/2/).

Data must be accompanied by the following statement:

“Contains Joint Nature Conservation Committee and Marine Scotland Science materials ©JNCC/MSS 2014/2015”

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APPENDIX 1 Vessel and Equipment Used (Additional Information)

Vessel

For more information on MRV Scotia, please see:
http://www.scotland.gov.uk/Topics/marine/science/scienceops/vessels-technology/vessels/scotia

Sonar Scout Ultra-Short Base Line (USBL) acoustic transponder

For information on USBL system used, please see:
http://www.sonardyne.com/products/positioning/scout-usbl.html

SBE 911plus CTD

For information on CTD system used, please see:
http://www.seabird.com/sbe911plus-ctd

C-Star Transmissometer

For information on CTD system used, please see:
http://www.wetlabs.com/cstar

APPENDIX 2 Equipment Configuration and Calibration

Camera

Camera	Viewing angle (nominal) deg	Viewing angle Horizontal (deg)	Viewing angle Vertical (deg)	Aspect Ratio	Field width (mm) at range 1.25m	Field height (mm) at range 1.25m
Kongsberg OE-14-366 (TV)	61 (diagonal)	50	41	4:3	975	750
Kongsberg OE-14-408 (Digital Stills)	62 (diagonal)	50	38	4:3	1125	870
SubC Control HD 1Cam Alpha	60 (horizontal)	60	34	16:9	1100	625

Digital Stills Camera configuration	
Focus	1.25m (fixed)

Aperture	f5.6
Mode	Aperture Priority
ISO	200
Flash	1/8 +1
Resolution	RAW
HD camera configuration	
File format	.M2TS
Image quality	HD-FH
Filename = recording start date and time	YYMMDDHHMMSS (eg 20130830002125)
Recording capacity	96GB (available time approx 12h 20m)
Reference weight	st/st, diameter 63.5 mm
Length of rope from face of DSC lens to base of weight	1.25m
Laser projectors	2-pairs orthogonal, centre square = 64mm sides

Other

- Sea-Bird SBE21 thermosalinograph data collected was calibrated using water sample data analysis results.
- Application of cruise calibrations to CTD data was not required as manufacturers calibration coefficients were applied as the data is recorded.
- USBL and ADCP systems did not require calibration.

APPENDIX 3 Navigation Data

Navigation data (ship's position) is from the vessels main system (i.e. GPS aerial position). Offsets were not applied.

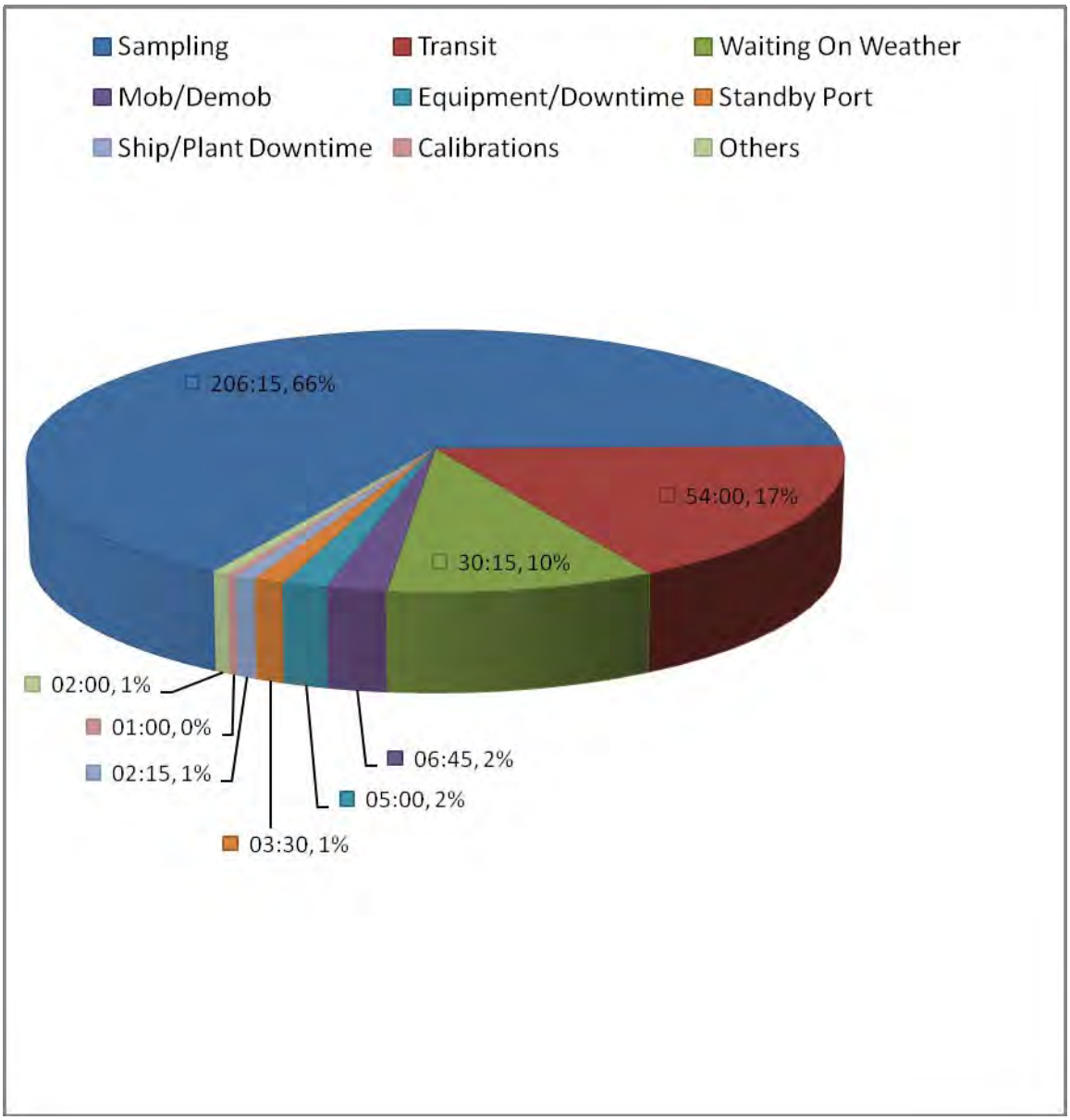
Positional data for the USBL was supplied from the ship's multibeam system and is corrected (to within 1m) for the drop keel, where the USBL transceiver is located. Therefore the USBL is corrected for its location.

Vessel heading was supplied from the same source.

The motion reference for the USBL is from the USBL unit.

APPENDIX 4 Breakdown of survey operation time

Activity	Hours Spent
Mob/Demob	06:45
Offshore Calibrations	01:00
Total Operation Sampling	206:15
Equipment/Downtime	05:00
Ship/Plant Downtime	02:15
Waiting On Weather	30:15
Transit	54:00
Standby Port	03:30
Others	02:00
Total:	**311:00**



Original content was created pre-GDPR and has been removed as it contained personal information. No scientific or technical content has been removed.

APPENDIX 6 Survey metadata (summary version; full electronic spreadsheet (xls) available on request)

Station Name	Attempt	Gear	SOL / EOL	Still No.	Date	Time	Water Depth (m)	USBL Easting (WGS84 UTM 30N)	USBL Northing (WGS84 UTM 30N)	Ship Latitude (degrees)	Ship Longitude (degrees)	Cable out (m)
1714S_SBR_TS30_S1	NA	DC/CTD	SOL	1	29/10/2014	14:17	99.5	371413.55	6557444.2	59.13729	-5.24766	113
1714S_SBR_TS30_S1	NA	DC/CTD	EOL	33	29/10/2014	14:27	93	371453.98	6557676.4	59.13937	-5.24700	107
1714S_SBR_TS31_S2	NA	DC/CTD	SOL	1	29/10/2014	16:24	96.0	371455.96	6558637.6	59.14734	-5.24826	106
1714S_SBR_TS31_S2	NA	DC/CTD	EOL	31	29/10/2014	16:34	102.0	371305.76	6558505.1	59.14611	-5.25072	102
1714S_SBR_TS29_S3	NA	DC/CTD	SOL	1	29/10/2014	17:14	108.0	371698.77	6559600.5	59.15596	-5.24448	119
1714S_SBR_TS29_S3	NA	DC/CTD	EOL	15	29/10/2014	17:23	106	no USBL	no USBL	59.15502	-5.24640	120
1714S_SBR_TS101_S4	NA	DC/CTD	SOL	1	29/10/2014	18:33	88.0	372712.16	6560917.8	59.16824	-5.22770	99
1714S_SBR_TS101_S4	NA	DC/CTD	EOL	18	29/10/2014	18:43	93.0	372594.46	6560819.8	59.16728	-5.22983	99
1714S_SBR_TS28_S5	NA	DC/CTD	SOL	1	29/10/2014	19:27	101.0	373687.31	6562432	59.18200	-5.21148	116
1714S_SBR_TS28_S5	NA	DC/CTD	EOL	35	29/10/2014	19:44	93.0	373398.04	6562313.6	59.18088	-5.21652	101
1714S_SBR_TS59_S6	NA	DC/CTD	SOL	1	29/10/2014	20:38	83.0	375658.05	6561382.4	59.17328	-5.17668	94
1714S_SBR_TS59_S6	NA	DC/CTD	EOL	31	29/10/2014	20:50	85.0	375426.56	6561452.3	59.17389	-5.18082	95
1714S_SBR_TS60_S7	NA	DC/CTD	SOL	1	29/10/2014	21:43	100.0	377577.27	6563992.2	59.19696	-5.14453	111
1714S_SBR_TS60_S7	NA	DC/CTD	EOL	29	29/10/2014	21:54	95.0	377401.64	6563898.7	59.19601	-5.14758	111
1714S_SBR_TS27_S8	NA	DC/CTD	SOL	1	29/10/2014	22:31	91.6	380119.75	6562757.9	59.18661	-5.09937	106

1714S_SBR_TS27_S8	NA	DC/CTD	EOL	25	29/10/2014	22:41	91.7	379947.12	6562708	59.18611	-5.10234	107
1714S_SBR_TS44_S9	NA	DC/CTD	SOL	1	29/10/2014	23:17	92.0	379041.55	6561439.2	59.17441	-5.11770	111
1714S_SBR_TS44_S9	NA	DC/CTD	EOL	33	29/10/2014	23:28	90.0	378853.19	6561427.5	59.17434	-5.12077	107
1714S_SBR_TS15_S10	NA	DC/CTD	SOL	1	30/10/2014	00:16	77.5	382046.14	6560645.8	No fix	No fix	102
1714S_SBR_TS15_S10	NA	DC/CTD	EOL	30	30/10/2014	00:26	77.8	381825.87	6560583.2	No fix	No fix	94
1714S_SBR_TS16_S11	NA	DC/CTD	SOL	1	30/10/2014	01:01	83.0	379627.59	6558805.1	59.15115	-5.10605	101
1714S_SBR_TS16_S11	NA	DC/CTD	EOL	30	30/10/2014	01:11	83.0	379412.59	6558899.3	59.15195	-5.11014	109
1714S_SBR_TS17_S12	NA	DC/CTD	SOL	1	30/10/2014	01:39	74.9	379384.78	6557419.3	No fix	No fix	90
1714S_SBR_TS17_S12	NA	DC/CTD	EOL	25	30/10/2014	01:49	68.9	379694.92	6557279.8	59.13733	-5.10163	80
1714S_SBR_TS18_S13	NA	DC/CTD	SOL	1	30/10/2014	02:29	59.3	379194.59	6555570.3	59.12185	-5.10938	75
1714S_SBR_TS18_S13	NA	DC/CTD	EOL	20	30/10/2014	02:40	61.5	379464.93	6555511.3	59.12138	-5.10451	75
1714S_SBR_TS19_S14	NA	DC/CTD	SOL	1	30/10/2014	03:15	65.9	379270.2	6553247.5	59.10088	-5.10685	77
1714S_SBR_TS19_S14	NA	DC/CTD	EOL	31	30/10/2014	03:26	66.3	379418.95	6553017.2	59.09882	-5.10426	79
1714S_SBR_TS12_S15	NA	DC/CTD	SOL	1	30/10/2014	04:11	63.0	381548.95	6551862.8	59.08931	-5.06604	76
1714S_SBR_TS12_S15	NA	DC/CTD	EOL	24	30/10/2014	04:21	63.0	381800.73	6551747.2	59.08836	-5.06177	76
1714S_SBR_TS43_S16	NA	DC/CTD	SOL	1	30/10/2014	05:05	62.2	381203.47	6554042.9	59.10871	-5.07362	70
1714S_SBR_TS43_S16	NA	DC/CTD	EOL	18	30/10/2014	05:16	60.4	381280.05	6553877.7	59.10731	-5.07211	67
1714S_SBR_TS14_S17	NA	DC/CTD	SOL	1	30/10/2014	06:31	68.8	380345.25	6555543.4	59.12189	-5.08928	80
1714S_SBR_TS14_S17	NA	DC/CTD	EOL	20	30/10/2014	06:42	64.9	380527.73	6555359.5	59.12024	-5.08589	84
1714S_SBR_TS13_S18	NA	DC/CTD	SOL	1	30/10/2014	07:49	70.3	382510.91	6555289.2	59.12016	-5.05162	80
1714S_SBR_TS13_S18	NA	DC/CTD	EOL	23	30/10/2014	08:01	66.4	382682.38	6555025.4	59.11780	-5.04849	79
1714S_SBR_TS32_S19	NA	DC/CTD	SOL	1	30/10/2014	09:03	65.0	386130.15	6549371.1	59.06810	-4.98535	74

1714S_SBR_TS32_S19	NA	DC/CTD	EOL	23	30/10/2014	09:15	65.3	386264.72	6549264.6	59.06719	-4.98302	75
1714S_SBR_TS33_S20	NA	DC/CTD	SOL	1	30/10/2014	09:54	65.4	383864.05	6548201.3	59.05688	-5.02454	71
1714S_SBR_TS33_S20	NA	DC/CTD	EOL	21	30/10/2014	10:05	68.7	384016.61	6548039.6	59.05550	-5.02169	78
1714S_SBR_TS58_S21	NA	DC/CTD	SOL	1	30/10/2014	12:32	57	386866.15	6547285.2	59.04948	-4.97175	67
1714S_SBR_TS58_S21	NA	DC/CTD	EOL	41	30/10/2014	12:42	55	387081.59	6547122.6	59.04802	-4.96788	63
1714S_SBR_TS11_S22	NA	DC/CTD	SOL	1	30/10/2014	13:08	57	387542.86	6545734.5	59.03577	-4.95903	67
1714S_SBR_TS11_S22	NA	DC/CTD	EOL	36	30/10/2014	13:17	54	387739.1	6545580.5	59.03441	-4.95561	66
1714S_SBR_TS49_S23	NA	DC/CTD	SOL	1	30/10/2014	13:46	53	388508.23	6546630.3	59.04394	-4.94294	62
1714S_SBR_TS49_S23	NA	DC/CTD	EOL	27	30/10/2014	13:55	54	no USBL	no USBL	No fix	No fix	61
1714S_SBR_TS48_S24	NA	DC/CTD	SOL	1	30/10/2014	15:21	53.3	390459.45	6549807.2	59.07306	-4.91039	59
1714S_SBR_TS48_S24	NA	DC/CTD	EOL	22	30/10/2014	15:31	50.8	390463.01	6549600.3	59.07117	-4.91018	62
1714S_SBR_TS41_S25	NA	DC/CTD	SOL	1	30/10/2014	16:15	59.6	391983.74	6553903.8	59.11030	-4.88538	70
1714S_SBR_TS41_S25	NA	DC/CTD	EOL	30	30/10/2014	16:29	69.5	392224.83	6553667.6	59.10827	-4.88105	79
1714S_SBR_TS56_S26	NA	DC/CTD	SOL	1	30/10/2014	18:21	49	no USBL	no USBL	No fix	No fix	56
1714S_SBR_TS56_S26	NA	DC/CTD	EOL	40	30/10/2014	18:32	51.6	392385.34	6549367.4	59.06983	-4.87605	57
1714S_SBR_TS57_S27	NA	DC/CTD	SOL	1	30/10/2014	19:13	46	389998.96	6548185.9	59.05889	-4.91668	67
1714S_SBR_TS57_S27	NA	DC/CTD	EOL	36	30/10/2014	19:24	48.9	390222.49	6548153.4	59.05863	-4.91297	57
1714S_SBR_TS34_S28	NA	DC/CTD	SOL	1	30/10/2014	20:17	61.6	389799.84	6541766.7	59.00101	-4.91737	70
1714S_SBR_TS34_S28	NA	DC/CTD	EOL	35	30/10/2014	20:28	59.8	389966.29	6541715.7	59.00062	-4.91434	70
1714S_SBR_TS35_S29	NA	DC/CTD	SOL	1	30/10/2014	21:25	65	388259.57	6540695	58.99093	-4.94370	74
1714S_SBR_TS35_S29	NA	DC/CTD	EOL	29	30/10/2014	21:35	65	388456.5	6540589.6	58.99006	-4.94026	75
1714S_SBR_TS40_S30	NA	DC/CTD	SOL	1	30/10/2014	22:17	74.2	385546.9	6540924.5	58.99227	-4.99105	74.2

1714S_SBR_TS40_S30	NA	DC/CTD	EOL	23	30/10/2014	22:28	69	385756.97	6540877.3	58.99190	-4.98732	69
1714S_SBR_TS10_S31	NA	DC/CTD	SOL	1	30/10/2014	22:58	61.5	387586.31	6539149.7	58.97679	-4.95477	72
1714S_SBR_TS10_S31	NA	DC/CTD	EOL	21	30/10/2014	23:09	61.7	387781.14	6539074	58.97613	-4.95132	77
1714S_SBR_TS50_S32	NA	DC/CTD	SOL	1	30/10/2014	23:38	51.7	389478.18	6539386	58.97931	-4.92213	59
1714S_SBR_TS50_S32	NA	DC/CTD	EOL	31	30/10/2014	23:48	56.2	389629.61	6539259.7	58.97823	-4.91948	68
1714S_SBR_TS51_S33	NA	DC/CTD	SOL	1	31/10/2014	00:26	52.6	392304.52	6540629.9	58.99120	-4.87355	59
1714S_SBR_TS51_S33	NA	DC/CTD	EOL	33	31/10/2014	00:36	66	392521.11	6540539.1	58.99047	-4.86981	74
1714S_SBR_TS36_S34	NA	DC/CTD	SOL	1	31/10/2014	01:14	56	391095.34	6538738.3	58.97413	-4.89581	70
1714S_SBR_TS36_S34	NA	DC/CTD	EOL	21	31/10/2014	01:24	56.2	390876.14	6538667.2	58.97350	-4.89959	74
1714S_SBR_TS52_S35	NA	DC/CTD	SOL	1	31/10/2014	01:58	51.7	389392.55	6536282.2	58.95161	-4.92382	68
1714S_SBR_TS52_S35	NA	DC/CTD	EOL	28	31/10/2014	02:08	51.2	389231.53	6536237.8	58.95117	-4.92658	59
1714S_SBR_TS53_S36	NA	DC/CTD	SOL	1	31/10/2014	02:42	51.5	389759.75	6533519.9	58.92717	-4.91495	61
1714S_SBR_TS53_S36	NA	DC/CTD	EOL	27	31/10/2014	02:52	55	389960.55	6533288.9	58.92515	-4.91137	63
1714S_SBR_TS9_S37	NA	DC/CTD	SOL	1	31/10/2014	03:53	51	390448.36	6532127	58.91449	-4.90144	60
1714S_SBR_TS9_S37	NA	DC/CTD	EOL	23	31/10/2014	04:03	55	390658.67	6531927.6	58.91271	-4.89763	65
1714S_SBR_TS46_S38	NA	DC/CTD	SOL	1	31/10/2014	04:47	42.7	388655.62	6531824.5	58.91133	-4.93228	51
1714S_SBR_TS46_S38	NA	DC/CTD	EOL	27	31/10/2014	04:57	46.7	388844.05	6531653.8	58.90985	-4.92896	56
1714S_SBR_TS07_S39	NA	DC/CTD	SOL	1	31/10/2014	05:19	34.3	387585.91	6529454.9	58.88989	-4.94963	43
1714S_SBR_TS07_S39	NA	DC/CTD	EOL	25	31/10/2014	05:50	45.6	387737.49	6529346.5	58.88893	-4.94679	56
1714S_SBR_TS05_S40	NA	DC/CTD	SOL	1	31/10/2014	06:46	50	383911.57	6528673.5	58.88183	-5.01296	61
1714S_SBR_TS05_S40	NA	DC/CTD	EOL	24	31/10/2014	06:57	43.7	384016.75	6528513.2	58.88039	-5.01105	59
1714S_SBR_TS03_S41	NA	DC/CTD	SOL	1	31/10/2014	07:32	59.7	385208.83	6526583.8	58.86363	-4.98909	70

1714S_SBR_TS03_S41	NA	DC/CTD	EOL	23	31/10/2014	07:43	61.3	385423.81	6526514.7	58.86293	-4.98531	77
1714S_SBR_TS02_S42	NA	DC/CTD	SOL	1	31/10/2014	09:01	65.3	382063.59	6526731.6	58.86394	-5.04403	77
1714S_SBR_TS02_S42	NA	DC/CTD	EOL	26	31/10/2014	09:12	57.6	no USBL	no USBL	No fix	No fix	73
1714S_SBR_TS55_S43	NA	DC/CTD	SOL	1	31/10/2014	09:50	48.1	384213.53	6527683.6	58.87302	-5.00718	65
1714S_SBR_TS55_S43	NA	DC/CTD	EOL	24	31/10/2014	10:01	46	384435.92	6527671.1	58.87297	-5.00338	62
1714S_SBR_TS06_S44	NA	DC/CTD	SOL	1	31/10/2014	10:40	52.3	385231.61	6530196.2	58.89564	-4.99149	61
1714S_SBR_TS06_S44	NA	DC/CTD	EOL	22	31/10/2014	10:52	52.8	385354.87	6529998.4	58.89389	-4.98923	63
1714S_SBR_TS04_S45	NA	DC/CTD	SOL	1	31/10/2014	11:24	54.5	386457	6531608.3	58.90860	-4.97105	65
1714S_SBR_TS04_S45	NA	DC/CTD	EOL	23	31/10/2014	11:34	51.1	386614.27	6531439	58.90717	-4.96822	60
1714S_SBR_TS08_S46	NA	DC/CTD	SOL	1	31/10/2014	12:39	45.6	387960.78	6532128.5	58.91407	-4.94693	62
1714S_SBR_TS08_S46	NA	DC/CTD	EOL	36	31/10/2014	12:50	48.4	387699.96	6532085.7	58.91367	-4.95142	65
1714S_SBR_TS54_S47	NA	DC/CTD	SOL	1	31/10/2014	13:23	51.5	386071.36	6533133.1	58.92262	-4.98003	69
1714S_SBR_TS54_S47	NA	DC/CTD	EOL	24	31/10/2014	13:36	51.6	385882.51	6533151.5	58.92276	-4.98341	65
1714S_SBR_TS45_S48	NA	DC/CTD	SOL	1	31/10/2014	14:02	48	385167.85	6532826.1	58.91944	-4.99559	69
1714S_SBR_TS45_S48	NA	DC/CTD	EOL	36	31/10/2014	14:15	51.6	384869.95	6532728.1	58.91849	-5.00064	67
1714S_SBR_TS39_S49	NA	DC/CTD	SOL	1	31/10/2014	14:47	68	382532.16	6534489.9	58.93369	-5.04209	81
1714S_SBR_TS39_S49	NA	DC/CTD	EOL	30	31/10/2014	14:57	69.9	382342.5	6534518.7	No fix	No fix	80
1714S_SBR_TS37_S50	NA	DC/CTD	SOL	1	31/10/2014	15:25	66.6	383455.42	6535265.8	58.94050	-5.02538	80
1714S_SBR_TS37_S50	NA	DC/CTD	EOL	37	31/10/2014	15:37	66.4	383525.75	6534997	58.93813	-5.02396	77
1714S_SBR_TS23_S51	NA	DC/CTD	SOL	1	31/10/2014	16:37	68.4	381121.02	6544330.3	59.02131	-5.07122	79
1714S_SBR_TS23_S51	NA	DC/CTD	EOL	35	31/10/2014	16:48	69.3	380989.83	6544178.8	59.01997	-5.07338	80
1714S_SBR_TS22_S52	NA	DC/CTD	SOL	1	31/10/2014	17:28	63.5	381712.73	6546395.9	59.04009	-5.06184	73

1714S_SBR_TS22_S52	NA	DC/CTD	EOL	31	31/10/2014	17:38	59.7	381578.76	6546268.5	59.03886	-5.06408	74
1714S_SBR_TS47_S53	NA	DC/CTD	SOL	1	31/10/2014	18:37	60.2	No USBL	No USBL	59.02924	-5.20669	70
1714S_SBR_TS47_S53	NA	DC/CTD	EOL	22	31/10/2014	18:46	45.4	No USBL	No USBL	59.02788	-5.20828	59
1714S_SBR_TS38_S54	NA	DC/CTD	SOL	1	31/10/2014	19:26	71	369789.31	6546036.7	59.03321	-5.26927	89
1714S_SBR_TS38_S54	NA	DC/CTD	EOL	29	31/10/2014	19:37	72.1	369651	6545817.1	59.03134	-5.27143	86
1714S_SBR_TS26_S55	NA	DC/CTD	SOL	1	31/10/2014	20:50	77.9	372337.65	6550419.3	59.07345	-5.22729	91
1714S_SBR_TS26_S55	NA	DC/CTD	EOL	26	31/10/2014	21:00	75.3	372271.78	6550220	59.07155	-5.22843	91
1714S_SBR_TS42_S56	NA	DC/CTD	SOL	1	31/10/2014	21:47	64	376667.93	6549182.5	59.06364	-5.15131	78
1714S_SBR_TS42_S56	NA	DC/CTD	EOL	38	31/10/2014	21:57	64	376580.32	6549013.4	59.06210	-5.15275	77
1714S_SBR_TS93_S57	NA	DC/CTD	SOL	1	31/10/2014	22:34	72	375689.59	6550116.3	59.07165	-5.16877	84
1714S_SBR_TS93_S57	NA	DC/CTD	EOL	39	31/10/2014	22:44	74	375732.69	6549939	59.07015	-5.16789	89
1714S_SBR_TS85_S58	NA	DC/CTD	SOL	1	31/10/2014	23:15	73	374577.4	6549211.2	59.06328	-5.18827	90
1714S_SBR_TS85_S58	NA	DC/CTD	EOL	29	31/10/2014	23:25	75	374449.86	6549066.8	59.06196	-5.19027	88
1714S_SBR_TS98_S59	NA	DC/CTD	SOL	1	01/11/2014	00:00	73	372711.9	6547313.5	59.04587	-5.21932	91
1714S_SBR_TS98_S59	NA	DC/CTD	EOL	19	01/11/2014	00:10	71	372655.82	6547091.2	59.04363	-5.22030	88
1714S_SBR_TS61_S60	NA	DC/CTD	SOL	1	01/11/2014	01:00	88.6	371040	6542285.2	58.99998	-5.24575	111
1714S_SBR_TS61_S60	NA	DC/CTD	EOL	21	01/11/2014	01:10	87	370917.04	6542116.4	58.99835	-5.24791	109
1714S_SBR_TS62_S61	NA	DC/CTD	SOL	1	01/11/2014	01:50	84	373128.17	6542560.1	59.00298	-5.20919	103
1714S_SBR_TS62_S61	NA	DC/CTD	EOL	27	01/11/2014	02:01	88	373235.79	6542382.8	59.00133	-5.20730	109
1714S_SBR_TS63_S62_A2	NA	DC/CTD	SOL	1	01/11/2014	03:14	87.9	374379.13	6543492.8	59.01163	-5.18842	114
1714S_SBR_TS63_S62_A2	NA	DC/CTD	EOL	22	01/11/2014	03:25	85.6	374286.03	6543263.4	59.00964	-5.18968	103
1714S_SBR_TS97_S63	NA	DC/CTD	SOL	1	01/11/2014	04:22	69.5	376820.02	6547390.6	59.04735	-5.14808	93

1714S_SBR_TS97_S63	NA	DC/CTD	EOL	26	01/11/2014	04:32	70.5	376717.73	6547095	59.04443	-5.14969	109
1714S_SBR_TS73_S64	NA	DC/CTD	SOL	1	01/11/2014	05:16	88.1	376490.13	6544444.5	59.02159	-5.15136	103
1714S_SBR_TS73_S64	NA	DC/CTD	EOL	27	01/11/2014	05:30	88.3	376388.58	6544321.1	59.02046	-5.15306	103
1714S_SBR_TS67_S65	NA	DC/CTD	SOL	1	01/11/2014	06:12	77.1	375770.09	6542478.1	59.00317	-5.16317	85
1714S_SBR_TS67_S65	NA	DC/CTD	EOL	23	01/11/2014	06:23	78.5	375780.22	6542315.9	59.00171	-5.16283	89
1714S_SBR_ADCP2_S66	1	ADCP	SOL	n/a	01/11/2014	18:56	60.8	n/a	n/a	59°2.8'N	4°59.49'W	n/a
1714S_SBR_ADCP2_S66	1	ADCP	EOL	n/a	02/11/2014	08:00	61.8	n/a	n/a	59°03.34'N	05°0.13'W	n/a
1714S_SBR_ADCP3_S67	1	ADCP	SOL	n/a	02/11/2014	18:51	60.9	n/a	n/a	58°56.25'N	04°58.3'W	n/a
1714S_SBR_ADCP3_S67	1	ADCP	EOL	n/a	03/11/2014	01:09	56.2	n/a	n/a	58°55.76'N	04°59.02'W	n/a
1714S_SBR_TS77_S68	NA	DC/CTD	SOL	1	03/11/2014	01:46	80.7	380756.71	6532835.6	58.91800	-5.07145	94
1714S_SBR_TS77_S68	NA	DC/CTD	EOL	22	03/11/2014	01:55	81.2	380694.43	6532567.4	58.91566	-5.07212	92
1714S_SBR_TS75_S69	NA	DC/CTD	SOL	1	03/11/2014	02:39	83.9	376978.61	6532461.7	58.91356	-5.13723	98
1714S_SBR_TS75_S69	NA	DC/CTD	EOL	24	03/11/2014	02:48	86.3	376836.79	6532262.3	58.91177	-5.13966	104
1714S_SBR_TS74_S70	NA	DC/CTD	SOL	1	03/11/2014	03:24	89.8	374293.58	6530665.1	58.89665	-5.18331	121
1714S_SBR_TS74_S70	NA	DC/CTD	EOL	23	03/11/2014	03:34	89.4	374114.5	6530500.6	58.89501	-5.18660	138
1714S_SBR_TS71_S71	NA	DC/CTD	SOL	1	03/11/2014	04:09	89.6	371901.92	6530162.1	58.89168	-5.22431	112
1714S_SBR_TS71_S71	NA	DC/CTD	EOL	28	03/11/2014	04:19	90	371793.24	6530042.1	58.89060	-5.22609	110
1714S_SBR_TS70_S72	NA	DC/CTD	SOL	1	03/11/2014	05:07	85.4	No USBL	No USBL	58.90889	-5.20278	108
1714S_SBR_TS70_S72	NA	DC/CTD	EOL	33	03/11/2014	05:21	86.1	373115.41	6531910.5	58.90759	-5.20389	101
1714S_SBR_TS69_S73	NA	DC/CTD	SOL	1	03/11/2014	06:11	84	376190	6533929.6	58.92656	-5.15120	96
1714S_SBR_TS69_S73	NA	DC/CTD	EOL	21	03/11/2014	06:23	84	376114.73	6533790.8	58.92521	-5.15255	101
1714S_SBR_TS76_S74	NA	DC/CTD	SOL	1	03/11/2014	07:16	81.2	378779.61	6534595.9	58.93333	-5.10684	95

1714S_SBR_TS76_S74	NA	DC/CTD	EOL	31	03/11/2014	07:26	81.1	378636.93	6534516.2	58.93260	-5.10915	93
1714S_SBR_TS100_S75	NA	DC/CTD	SOL	1	03/11/2014	08:35	81.6	380097.79	6534422	No fix	No fix	99
1714S_SBR_TS100_S75	NA	DC/CTD	EOL	34	03/11/2014	08:46	71.5	380328.12	6534382	No fix	No fix	101
1714S_SBR_TS68_S76	NA	DC/CTD	SOL	1	03/11/2014	09:26	85.4	377486.24	6535441.6	58.94109	-5.12765	103
1714S_SBR_TS68_S76	NA	DC/CTD	EOL	25	03/11/2014	09:36	86.2	377689.56	6535442.6	58.94114	-5.12383	107
1714S_SBR_TS24_S77	NA	DC/CTD	SOL	1	03/11/2014	10:13	76.7	379350.83	6537630.7	58.96127	-5.09655	94
1714S_SBR_TS24_S77	NA	DC/CTD	EOL	32	03/11/2014	10:26	76.6	379497.75	6537597.5	58.96101	-5.09396	91
1714S_SBR_TS66_S78	NA	DC/CTD	SOL	1	03/11/2014	11:14	85.3	375453.26	6537248.1	58.95685	-5.16384	107
1714S_SBR_TS66_S78	NA	DC/CTD	EOL	21	03/11/2014	11:25	82.8	375626.49	6537279.8	58.95732	-5.16076	108
1714S_SBR_TS65_S79	NA	DC/CTD	SOL	1	03/11/2014	12:57	94	372657.68	6537088.2	58.95474	-5.21264	108
1714S_SBR_TS65_S79	NA	DC/CTD	EOL	25	03/11/2014	13:09	94	372784.85	6537163.5	58.95548	-5.21042	109
1714S_SBR_TS96_S80	NA	DC/CTD	SOL	1	03/11/2014	14:04	87.4	377054.37	6539595.4	58.97859	-5.13771	100
1714S_SBR_TS96_S80	NA	DC/CTD	EOL	21	03/11/2014	14:16	86.2	377288.53	6539688.4	58.97939	-5.13387	100
1714S_SBR_TS94_S81	NA	DC/CTD	SOL	1	03/11/2014	15:01	76.8	383486.48	6539305.7	58.97777	-5.02610	88
1714S_SBR_TS94_S81	NA	DC/CTD	EOL	29	03/11/2014	15:13	72.6	383685.02	6539344	58.97815	-5.02269	84
1714S_SBR_TS92_S82	NA	DC/CTD	SOL	1	03/11/2014	15:46	76.7	381943.62	6540198.6	58.98469	-5.05548	93
1714S_SBR_TS92_S82	NA	DC/CTD	EOL	26	03/11/2014	15:57	78.1	381765.99	6540034.8	58.98316	-5.05852	96
1714S_SBR_TS95_S83	NA	DC/CTD	SOL	1	03/11/2014	16:45	79.8	380594.61	6541377.3	58.99574	-5.07800	89
1714S_SBR_TS95_S83	NA	DC/CTD	EOL	26	03/11/2014	16:56	82.8	380637	6541526.4	58.99708	-5.07745	94
1714S_SBR_TS78_S84	NA	DC/CTD	SOL	1	03/11/2014	18:12	84.4	377791.43	6541121.3	58.99264	-5.12629	96
1714S_SBR_TS78_S84	NA	DC/CTD	EOL	21	03/11/2014	18:22	83.9	377804.11	6541291	58.99410	-5.12610	97
1714S_SBR_TS64_S85	NA	DC/CTD	SOL	1	03/11/2014	19:01	78.8	377813.54	6542411.9	59.00414	-5.12653	91

1714S_SBR_TS64_S85	NA	DC/CTD	EOL	32	03/11/2014	19:13	80.8	377895.31	6542534.7	59.00523	-5.12520	92
1714S_SBR_RSS69_S86	NA	DC/CTD	SOL	1	03/11/2014	20:24	80.9	378562.29	6544032.1	59.01887	-5.11403	97
1714S_SBR_RSS69_S86	NA	DC/CTD	EOL	24	03/11/2014	20:35	77.6	378688.35	6544141.9	59.01991	-5.11195	94
1714S_SBR_RSS58_S87	NA	DC/CTD	SOL	1	03/11/2014	21:18	72.7	379990.71	6543726.4	59.01661	-5.08915	83
1714S_SBR_RSS58_S87	NA	DC/CTD	EOL	21	03/11/2014	21:28	71.7	380045.75	6543893.8	59.01821	-5.08796	93
1714S_SBR_RSS38_S88	NA	DC/CTD	SOL	1	03/11/2014	21:56	22.09	380844.88	6544484.1	59.02371	-5.07419	95
1714S_SBR_RSS38_S88	NA	DC/CTD	EOL	33	03/11/2014	22:08	34.03	380988.54	6544567.2	59.02443	-5.07180	87
1714S_SBR_RSS50_S89	NA	DC/CTD	SOL	1	03/11/2014	22:38	61.9	381823.36	6546378.6	59.04100	-5.05875	81
1714S_SBR_RSS50_S89	NA	DC/CTD	EOL	26	03/11/2014	22:47	60.3	381786	6546541.1	59.04242	-5.05963	74
1714S_SBR_RSS46_S90	NA	DC/CTD	SOL	1	03/11/2014	23:30	71.3	No USBL	No USBL	59.03485	-5.08773	96
1714S_SBR_RSS46_S90	NA	DC/CTD	EOL	26	03/11/2014	23:40	70.2	380267.87	6545832.9	59.03556	-5.08514	90
1714S_SBR_RSS57_S91	NA	DC/CTD	SOL	1	04/11/2014	00:24	61.5	382239.99	6545860.7	59.03647	-5.05090	78
1714S_SBR_RSS57_S91	NA	DC/CTD	EOL	28	04/11/2014	00:34	60	382419.34	6545973.9	59.03746	-5.04774	80
1714S_SBR_RSS65_S92	NA	DC/CTD	SOL	1	04/11/2014	01:04	63.1	381718.72	6546743.1	59.04425	-5.06089	75
1714S_SBR_RSS65_S92	NA	DC/CTD	EOL	24	04/11/2014	01:14	59	381771.21	6546938.2	59.04600	-5.06018	69
1714S_SBR_RSS40_S93	NA	DC/CTD	SOL	1	04/11/2014	01:41	68.7	382912.21	6548020.1	59.05606	-5.04049	81
1714S_SBR_RSS40_S93	NA	DC/CTD	EOL	24	04/11/2014	01:51	67.3	383154.66	6548185.7	59.05759	-5.03632	85
1714S_SBR_ADCP3_S94	2	ADCP	SOL	n/a	04/11/2014	03:04	64.2	n/a	n/a	58°56.22'N	4°58.94'W	n/a
1714S_SBR_ADCP3_S94	2	ADCP	EOL	n/a	04/11/2014	15:58	60.3	n/a	n/a	58°55.96'N	4°57.76'W	n/a
1714S_SBR_ADCP4_S95	1	ADCP	SOL	n/a	04/11/2014	17:02	86.1	n/a	n/a	58°58.94'N	5°05.88'W	n/a
1714S_SBR_ADCP4_S95	1	ADCP	EOL	n/a	05/11/2014	02:14	81.6	n/a	n/a	58°59.31'N	5°06.07'W	n/a
1714S_SBR_RSS67_S96	NA	DC/CTD	SOL	1	05/11/2014	03:24	63.7	385025.95	6546910.3	59.04652	-5.00342	73

1714S_SBR_RSS67_S96	NA	DC/CTD	EOL	24	05/11/2014	03:33	63.2	385067.69	6547121.2	59.04835	-5.00263	71
1714S_SBR_RSS53_S97	NA	DC/CTD	SOL	1	05/11/2014	04:25	64.4	388061.91	6549830.1	59.07299	-4.95156	76
1714S_SBR_RSS53_S97	NA	DC/CTD	EOL	18	05/11/2014	04:35	63.4	388193.89	6549718.1	59.07187	-4.94938	74
1714S_SBR_RSS52_S98	NA	DC/CTD	SOL	1	05/11/2014	10:20	57.9	389226.72	6550694.8	59.08118	-4.93139	77
1714S_SBR_RSS52_S98	NA	DC/CTD	EOL	24	05/11/2014	10:30	59.1	389424.39	6550697.2	59.08124	-4.92818	76
1714S_SBR_RSS70_S99	NA	DC/CTD	SOL	1	05/11/2014	11:09	67.6	386410	6551846.9	59.09092	-4.98108	84
1714S_SBR_RSS70_S99	NA	DC/CTD	EOL	29	05/11/2014	11:20	67.7	386639.63	6551895.9	59.09149	-4.97715	87
1714S_SBR_RSS60_S100	NA	DC/CTD	SOL	1	05/11/2014	12:20	67	388145.14	6552338.3	59.09572	-4.95106	85
1714S_SBR_RSS60_S100	NA	DC/CTD	EOL	31	05/11/2014	12:30	66	388444.02	6552340.7	59.09577	-4.94741	84
1714S_SBR_RSS59_S101	NA	DC/CTD	SOL	1	05/11/2014	13:03	70.8	389004.76	6554462.3	59.11503	-4.93708	89
1714S_SBR_RSS59_S101	NA	DC/CTD	EOL	28	05/11/2014	13:15	69.8	389236.83	6554439.6	59.11492	-4.93329	83
1714S_SBR_RSS41_S102	NA	DC/CTD	SOL	1	05/11/2014	13:40	67	389540.82	6553542.3	59.10713	-4.92762	82
1714S_SBR_RSS41_S102	NA	DC/CTD	EOL	21	05/11/2014	13:50	68	389613.41	6553684	59.10834	-4.92657	87
1714S_SBR_RSS54_S103	NA	DC/CTD	SOL	1	05/11/2014	14:23	62	390402.37	6553806	59.10952	-4.91278	70
1714S_SBR_RSS54_S103	NA	DC/CTD	EOL	36	05/11/2014	14:33	63	390661.1	6553855.8	59.11004	-4.90831	76
1714S_SBR_RSS55_S104	NA	DC/CTD	SOL	1	05/11/2014	15:06	64.3	390727.78	6552695.8	59.09960	-4.90669	72
1714S_SBR_RSS55_S104	NA	DC/CTD	EOL	29	05/11/2014	15:17	59.7	390911.35	6552707.7	59.09971	-4.90571	71
1714S_SBR_RSS39_S105	NA	DC/CTD	SOL	1	05/11/2014	17:28	61.4	389998.3	6552065.4	59.09330	-4.92139	78
1714S_SBR_RSS39_S105	NA	DC/CTD	EOL	17	05/11/2014	17:35	63.7	389897.62	6551978.3	59.09249	-4.92315	78
1714S_SBR_RSS47_S106	NA	DC/CTD	SOL	1	05/11/2014	22:01	56.9	390185.81	6551483.3	59.08801	-4.91588	69
1714S_SBR_RSS47_S106	NA	DC/CTD	EOL	31	05/11/2014	22:11	54.3	390281.02	6551289.8	59.08633	-4.91421	67
1714S_SBR_RSS63_S107	NA	DC/CTD	SOL	1	05/11/2014	22:42	53.7	391726.95	6551376.5	59.08746	-4.88907	66

1714S_SBR_RSS63_S107	NA	DC/CTD	EOL	27	05/11/2014	22:52	52.5	391659.45	6551096.5	59.08492	-4.89008	64
1714S_SBR_RSS68_S108	NA	DC/CTD	SOL	1	05/11/2014	23:26	61	393511.94	6549395.8	59.07017	-4.85653	73
1714S_SBR_RSS68_S108	NA	DC/CTD	EOL	28	05/11/2014	23:36	72	393619	6549182.4	59.06829	-4.85448	90
1714S_SBR_RSS48_S109	NA	DC/CTD	SOL	1	06/11/2014	00:28	53.8	391628.97	6549395.1	59.06971	-4.88961	64
1714S_SBR_RSS48_S109	NA	DC/CTD	EOL	21	06/11/2014	00:37	50.5	391535.61	6549145.6	59.06750	-4.89104	65
1714S_SBR_RSS61_S110	NA	DC/CTD	SOL	1	06/11/2014	01:18	51.5	390980.55	6550491.4	59.07952	-4.90107	66
1714S_SBR_RSS61_S110	NA	DC/CTD	EOL	29	06/11/2014	01:28	51.2	391156.73	6550351.1	59.07827	-4.89791	66
1714S_SBR_RSS66_S111	NA	DC/CTD	SOL	1	06/11/2014	01:52	51.8	390475.97	6549148.8	59.06736	-4.90929	62
1714S_SBR_RSS66_S111	NA	DC/CTD	EOL	29	06/11/2014	02:03	52.3	390629.9	6549055.8	59.06655	-4.90662	63
1714S_SBR_RSS44_S112	NA	DC/CTD	SOL	1	06/11/2014	02:35	54.8	389621.29	6550057.2	59.07527	-4.92468	72
1714S_SBR_RSS44_S112	NA	DC/CTD	EOL	28	06/11/2014	02:45	51.1	389930.88	6549898.1	59.07392	-4.91924	65
1714S_SBR_RSS56_S113	NA	DC/CTD	SOL	1	06/11/2014	03:09	58.6	389164.4	6548654.2	59.06241	-4.93214	76
1714S_SBR_RSS56_S113	NA	DC/CTD	EOL	26	06/11/2014	03:19	57.6	389369.15	6548541.9	59.06152	-4.92869	67
1714S_SBR_RSS42_S114	NA	DC/CTD	SOL	1	06/11/2014	03:47	59.5	391036.45	6547698	59.05477	-4.89991	71
1714S_SBR_RSS42_S114	NA	DC/CTD	EOL	26	06/11/2014	03:57	64.3	391125.23	6547606	59.05353	-4.89769	71
1714S_SBR_RSS62_S115	NA	DC/CTD	SOL	1	06/11/2014	04:40	53.7	389994.98	6547706.8	59.05407	-4.91775	63
1714S_SBR_RSS62_S115	NA	DC/CTD	EOL	36	06/11/2014	04:52	52.6	390070.86	6547563.9	59.05278	-4.91649	66
1714S_SBR_RSS49_S116	NA	DC/CTD	SOL	1	06/11/2014	05:35	64.5	389866.08	6545978.1	59.03844	-4.91948	77
1714S_SBR_RSS49_S116	NA	DC/CTD	EOL	25	06/11/2014	05:46	65.4	390016.07	6545841.9	59.03728	-4.91680	74
1714S_SBR_ADCP4_S117	2	ADCP	SOL	n/a	06/11/2014	07:48	82	n/a	n/a	58°58.55'N	5°04.55'W	n/a
1714S_SBR_ADCP4_S117	2	ADCP	EOL	n/a	06/11/2014	23:08	84	n/a	n/a	58°58.21'N	5°06.05'W	n/a
1714S_SBR_RSS43_S118	NA	DC/CTD	SOL	1	07/11/2014	00:23	53.2	388966.26	6547223.7	59.05009	-4.93434	69

1714S_SBR_RSS43_S118	NA	DC/CTD	EOL	22	07/11/2014	00:33	54.2	389187.44	6547330.4	59.05110	-4.93052	68
1714S_SBR_RSS51_S119	NA	DC/CTD	SOL	1	07/11/2014	01:06	52.4	388514.34	6545335.7	59.03303	-4.94116	74
1714S_SBR_RSS51_S119	NA	DC/CTD	EOL	31	07/11/2014	01:17	55.6	388650.76	6545435.4	59.03396	-4.93899	70
1714S_SBR_RSS37_S120	NA	DC/CTD	SOL	1	07/11/2014	01:52	59.8	387054.23	6547955.4	59.05621	-4.96802	85
1714S_SBR_RSS37_S120	NA	DC/CTD	EOL	28	07/11/2014	02:02	59	387241.83	6548105.2	59.05763	-4.96464	81
1714S_SBR_RSS45_S121	NA	DC/CTD	SOL	1	07/11/2014	04:20	62.1	385607.68	6546334.9	59.04075	-4.99305	71
1714S_SBR_RSS45_S121	NA	DC/CTD	EOL	21	07/11/2014	04:30	63.2	385716.6	6546230.6	59.03979	-4.99120	71
1714S_SBR_RSS64_S122	NA	DC/CTD	SOL	1	07/11/2014	05:08	72	385283.94	6544973.6	59.02829	-4.99873	72
1714S_SBR_RSS64_S122	NA	DC/CTD	EOL	35	07/11/2014	05:20	75	385313.08	6544827.1	59.02696	-4.99822	75
1714S_SBR_RSS36_S123	NA	DC/CTD	SOL	1	07/11/2014	05:58	68	384687.73	6545629.7	59.03400	-5.00993	78
1714S_SBR_RSS36_S123	NA	DC/CTD	EOL	36	07/11/2014	06:10	68	384726.72	6545481.2	59.03268	-5.00916	80
1714S_SBR_TS99_S124	NA	DC/CTD	SOL	1	07/11/2014	08:18	71.3	381974.5	6525633.3	58.85429	-5.04741	89
1714S_SBR_TS99_S124	NA	DC/CTD	EOL	30	07/11/2014	08:29	72.1	381755.14	6525656.6	58.85447	-5.05115	93
1714S_SBR_TS89_S125	NA	DC/CTD	SOL	1	07/11/2014	08:58	81.2	380161.54	6525183.3	58.84977	-5.07839	98
1714S_SBR_TS89_S125	NA	DC/CTD	EOL	31	07/11/2014	09:09	79.9	379958.95	6525205.9	58.84989	-5.08190	99
1714S_SBR_TS88_S126	NA	DC/CTD	SOL	1	07/11/2014	09:37	85.1	378517.51	6523547.8	58.83457	-5.10599	107
1714S_SBR_TS88_S126	NA	DC/CTD	EOL	31	07/11/2014	09:48	83	378313.67	6523459.6	58.83361	-5.10939	101
1714S_SBR_TS86_S127	NA	DC/CTD	SOL	1	07/11/2014	10:38	79.8	375029.9	6524620	58.84303	-5.16665	94
1714S_SBR_TS86_S127	NA	DC/CTD	EOL	27	07/11/2014	10:48	80.1	374768.46	6524479.7	58.84169	-5.17113	98
1714S_SBR_TS87_S128	NA	DC/CTD	SOL	1	07/11/2014	11:18	75.4	373289.26	6522867.5	58.82665	-5.19547	87
1714S_SBR_TS87_S128	NA	DC/CTD	EOL	31	07/11/2014	11:28	75.5	373072.86	6522656.2	58.82471	-5.19909	86
1714S_SBR_TS84_S129	NA	DC/CTD	SOL	1	07/11/2014	12:25	78	370291.58	6522420.5	58.82185	-5.24702	89

1714S_SBR_TS84_S129	NA	DC/CTD	EOL	28	07/11/2014	12:36	78	370086.64	6522353.6	58.82118	-5.25052	84
1714S_SBR_TS83_S130	NA	DC/CTD	SOL	1	07/11/2014	13:49	79	371595.73	6524742.8	58.84285	-5.22519	91
1714S_SBR_TS83_S130	NA	DC/CTD	EOL	29	07/11/2014	13:59	77	371570.94	6524500.2	58.84067	-5.22549	92
1714S_SBR_TS82_S131	NA	DC/CTD	SOL	1	07/11/2014	14:34	77.7	372343.99	6525822	No fix	No fix	98
1714S_SBR_TS82_S131	NA	DC/CTD	EOL	38	07/11/2014	14:45	78.4	372527.56	6525724.3	No fix	No fix	90
1714S_SBR_TS72_S132	NA	DC/CTD	SOL	1	07/11/2014	15:14	95	369949.04	6527158.2	58.86425	-5.25580	107
1714S_SBR_TS72_S132	NA	DC/CTD	EOL	31	07/11/2014	15:25	95.6	369739.56	6527058.8	58.86331	-5.25927	109
1714S_SBR_TS81_S133	NA	DC/CTD	SOL	1	07/11/2014	16:10	84.4	373699.3	6528522.5	58.87747	-5.19165	104
1714S_SBR_TS81_S133	NA	DC/CTD	EOL	33	07/11/2014	16:21	86.3	373453.27	6528387.4	58.87633	-5.19601	100
1714S_SBR_TS1_S134	NA	DC/CTD	SOL	1	07/11/2014	17:11	82.8	376279.17	6527857.4	58.87235	-5.14677	95
1714S_SBR_TS1_S134	NA	DC/CTD	EOL	29	07/11/2014	17:22	84.9	376142.17	6527894.2	58.87329	-5.14943	99
1714S_SBR_TS103_S135	NA	DC/CTD	SOL	1	07/11/2014	18:27	84.7	378608.07	6526656.8	58.86218	-5.10562	100
1714S_SBR_TS103_S135	NA	DC/CTD	EOL	31	07/11/2014	18:38	83.2	378549.48	6526529.5	58.86099	-5.10655	95
1714S_SBR_TS91_S136	NA	DC/CTD	SOL	1	07/11/2014	19:27	78.7	380796.2	6527974.6	58.87472	-5.06892	103
1714S_SBR_TS91_S136	NA	DC/CTD	EOL	25	07/11/2014	19:37	80	380621.91	6527896.2	58.87390	-5.07197	97
1714S_SBR_TS102_S137	NA	DC/CTD	SOL	1	07/11/2014	20:18	74.8	381794.94	6527547.7	58.87126	-5.05169	111
1714S_SBR_TS102_S137	NA	DC/CTD	EOL	32	07/11/2014	20:29	75.5	381522.36	6527496.3	58.87065	-5.05603	92
1714S_SBR_TS79_S138	NA	DC/CTD	SOL	1	07/11/2014	21:09	81.7	380287.73	6529812.4	58.89084	-5.07803	100
1714S_SBR_TS79_S138	NA	DC/CTD	EOL	35	07/11/2014	21:19	82.7	380206.76	6529621.6	58.88909	-5.07944	100
1714S_SBR_TS80_S139	NA	DC/CTD	SOL	1	07/11/2014	21:53	86.8	377318.58	6529681.4	58.88881	-5.12916	100
1714S_SBR_TS80_S139	NA	DC/CTD	EOL	30	07/11/2014	22:03	81.2	377276.14	6529445.4	58.88655	-5.12974	97
1714S_SBR_RSS91_S140	NA	DC/CTD	SOL	1	07/11/2014	23:28	48.6	383708.46	6526180.6	58.85938	-5.01674	74

1714S_SBR_RSS91_S140	NA	DC/CTD	EOL	27	07/11/2014	23:38	47.4	383510.09	6526028.4	58.85797	-5.02003	56
1714S_SBR_RSS101_S141	NA	DC/CTD	SOL	1	08/11/2014	00:22	62.1	382796.11	6525830.6	58.85595	-5.03219	66
1714S_SBR_RSS101_S141	NA	DC/CTD	EOL	31	08/11/2014	00:32	66.8	382587.13	6525655.2	58.85432	-5.03571	72
1714S_SBR_RSS98_S142	NA	DC/CTD	SOL	1	08/11/2014	01:03	72.9	381017.66	6527164.8	58.86731	-5.06340	87
1714S_SBR_RSS98_S142	NA	DC/CTD	EOL	33	08/11/2014	01:13	70.6	380935.57	6526902.8	58.86488	-5.06449	89
1714S_SBR_RSS85_S143	NA	DC/CTD	SOL	1	08/11/2014	01:47	49.7	383006.37	6525614.2	58.85446	-5.02622	86
1714S_SBR_RSS85_S143	NA	DC/CTD	EOL	30	08/11/2014	01:57	58.5	383133.65	6525735.5	58.85560	-5.02432	81
1714S_SBR_RSS77_S144	NA	DC/CTD	SOL	1	08/11/2014	02:26	52.1	385282.79	6526944.8	58.86699	-4.98765	77
1714S_SBR_RSS77_S144	NA	DC/CTD	EOL	34	08/11/2014	02:36	50.3	385456.67	6526990.5	58.86744	-4.98502	66
1714S_SBR_RSS95_S145	NA	DC/CTD	SOL	1	08/11/2014	03:09	62.6	383138.41	6527438.7	58.87081	-5.02527	83
1714S_SBR_RSS95_S145	NA	DC/CTD	EOL	37	08/11/2014	03:19	63.3	383305.82	6527596.4	58.87232	-5.02256	81
1714S_SBR_RSS105_S146	NA	DC/CTD	SOL	1	08/11/2014	03:46	61.1	383078.55	6528521.3	58.88008	-5.02860	72
1714S_SBR_RSS105_S146	NA	DC/CTD	EOL	26	08/11/2014	03:57	67	382968.4	6528372.2	58.87870	-5.03046	75
1714S_SBR_RSS80_S147	NA	DC/CTD	SOL	1	08/11/2014	04:38	57.6	383986.89	6529669.2	58.89058	-5.01355	71
1714S_SBR_RSS80_S147	NA	DC/CTD	EOL	30	08/11/2014	04:49	57	383982.65	6529533.4	58.88936	-5.01352	65
1714S_SBR_RSS75_S148	NA	DC/CTD	SOL	1	08/11/2014	05:23	38.1	383984.13	6528711.1	58.88213	-5.01340	63
1714S_SBR_RSS75_S148	NA	DC/CTD	EOL	23	08/11/2014	05:36	56.6	383826.56	6528698.2	58.88194	-5.01625	64
1714S_SBR_RSS81_S149	NA	DC/CTD	SOL	1	08/11/2014	06:16	61.7	383217.89	6530166	58.89484	-5.02774	77
1714S_SBR_RSS81_S149	NA	DC/CTD	EOL	20	08/11/2014	06:26	63.9	383122.1	6530012.2	58.89337	-5.02938	88
1714S_SBR_RSS86_S150	NA	DC/CTD	SOL	1	08/11/2014	07:13	60.7	383954.5	6531532.8	58.90735	-5.01581	86
1714S_SBR_RSS86_S150	NA	DC/CTD	EOL	29	08/11/2014	07:24	60.4	383905.64	6531420	58.90631	-5.01668	83
1714S_SBR_RSS99_S151	NA	DC/CTD	SOL	1	08/11/2014	08:26	54.8	385473.62	6532090.8	58.91281	-4.98969	71

1714S_SBR_RSS99_S151	NA	DC/CTD	EOL	29	08/11/2014	08:36	58.2	385336.43	6531992.6	58.91197	-4.99213	70
1714S_SBR_RSS84_S152	NA	DC/CTD	SOL	1	08/11/2014	09:11	66.3	383580.19	6532661.8	58.91728	-5.02301	83
1714S_SBR_RSS84_S152	NA	DC/CTD	EOL	22	08/11/2014	09:21	68	383435.04	6532512.1	58.91604	-5.02555	90
1714S_SBR_RSS97_S153	NA	DC/CTD	SOL	1	08/11/2014	09:58	63.5	385753.72	6534448.8	58.93409	-4.98620	83
1714S_SBR_RSS97_S153	NA	DC/CTD	EOL	26	08/11/2014	10:10	64.7	385516.96	6534369.3	58.93332	-4.99003	78
1714S_SBR_RSS88_S154	NA	DC/CTD	SOL	1	08/11/2014	10:44	58.2	387332.75	6535673.6	58.94550	-4.95912	73
1714S_SBR_RSS88_S154	NA	DC/CTD	EOL	31	08/11/2014	10:54	57	387215.4	6535521.8	58.94412	-4.96086	66
1714S_SBR_RSS92_S155	NA	DC/CTD	SOL	1	08/11/2014	11:20	62.3	385980.43	6535943.6	58.94749	-4.98237	70
1714S_SBR_RSS92_S155	NA	DC/CTD	EOL	29	08/11/2014	11:20	63	385868.56	6535810.1	58.94627	-4.98415	72
1714S_SBR_RSS74_S156	NA	DC/CTD	SOL	1	08/11/2014	12:47	62.8	385483.34	6536950.9	58.95638	-4.99124	71
1714S_SBR_RSS74_S156	NA	DC/CTD	EOL	27	08/11/2014	12:57	61.5	385283.36	6536871.3	58.95563	-4.99464	70
1714S_SBR_RSS83_S157	NA	DC/CTD	SOL	1	08/11/2014	13:31	59.5	387720.7	6537522.8	58.96208	-4.95265	67
1714S_SBR_RSS83_S157	NA	DC/CTD	EOL	31	08/11/2014	13:43	59	387432.86	6537477.4	58.96161	-4.95746	63
1714S_SBR_RSS71_S158	NA	DC/CTD	SOL	1	08/11/2014	14:20	61.2	387716.19	6538385.2	58.96985	-4.95285	68
1714S_SBR_RSS71_S158	NA	DC/CTD	EOL	28	08/11/2014	14:30	60.3	387479.19	6538205.1	58.96816	-4.95689	66
1714S_SBR_RSS89_S159	NA	DC/CTD	SOL	1	08/11/2014	14:53	57.4	386830.28	6537635.4	58.96290	-4.96807	67
1714S_SBR_RSS89_S159	NA	DC/CTD	EOL	33	08/11/2014	15:03	59.6	386557.69	6537641.2	58.96289	-4.97281	67
1714S_SBR_RSS87_S160	NA	DC/CTD	SOL	1	08/11/2014	15:32	59.1	386366.31	6538113.8	58.96762	-4.97500	72
1714S_SBR_RSS87_S160	NA	DC/CTD	EOL	30	08/11/2014	15:43	60.4	386544.49	6538242.6	58.96884	-4.97193	71
1714S_SBR_RSS102_S161	NA	DC/CTD	SOL	1	08/11/2014	16:06	62.9	387084.27	6537843.8	58.96531	-4.96242	72
1714S_SBR_RSS102_S161	NA	DC/CTD	EOL	28	08/11/2014	16:16	61.7	387267.94	6537941.7	58.96625	-4.95928	77
1714S_SBR_RSS104_S162	NA	DC/CTD	SOL	1	08/11/2014	16:43	59.4	388589.37	6537651.2	58.96384	-4.93621	66

1714S_SBR_RSS104_S162	NA	DC/CTD	EOL	21	08/11/2014	16:53	51.8	388798.24	6537703.7	58.96439	-4.93266	67
1714S_SBR_RSS103_S163	NA	DC/CTD	SOL	1	08/11/2014	17:27	58.3	NO USBL	NO USBL	58.94898	-4.90231	67
1714S_SBR_RSS103_S163	NA	DC/CTD	EOL	32	08/11/2014	17:37	59.5	390873.17	6536016.7	58.94983	-4.89706	68
1714S_SBR_RSS82_S164	NA	DC/CTD	SOL	1	08/11/2014	18:34	60.1	391243.01	6535314.1	58.94326	-4.89104	68
1714S_SBR_RSS82_S164	NA	DC/CTD	EOL	31	08/11/2014	18:47	59.6	391210.74	6535163.7	No fix	No fix	71
1714S_SBR_RSS96_S165	NA	DC/CTD	SOL	1	08/11/2014	19:23	58.8	390033.92	6535534.4	58.94509	-4.91263	79
1714S_SBR_RSS96_S165	NA	DC/CTD	EOL	42	08/11/2014	19:37	59.1	389911.97	6535442.4	58.94427	-4.91453	74
1714S_SBR_RSS93_S166	NA	DC/CTD	SOL	1	08/11/2014	20:26	61.3	388183.84	6534939.4	58.93938	-4.94455	85
1714S_SBR_RSS93_S166	NA	DC/CTD	EOL	28	08/11/2014	20:36	60.3	388023.7	6534905.6	58.93905	-4.94713	74
1714S_SBR_RSS73_S167	NA	DC/CTD	SOL	1	08/11/2014	21:05	52.1	387403.55	6533438.8	58.92574	-4.95713	68
1714S_SBR_RSS73_S167	NA	DC/CTD	EOL	26	08/11/2014	21:17	54.1	387259.52	6533397.9	58.92526	-4.95972	75
1714S_SBR_RSS78_S168	NA	DC/CTD	SOL	1	08/11/2014	21:51	57.3	388139.63	6534021.3	58.93128	-4.94468	74
1714S_SBR_RSS78_S168	NA	DC/CTD	EOL	28	08/11/2014	22:01	57.6	387963.78	6534059.4	58.93158	-4.94769	73
1714S_SBR_RSS76_S169	NA	DC/CTD	SOL	1	08/11/2014	22:32	48.7	387827.77	6532955.8	58.92173	-4.94926	60
1714S_SBR_RSS76_S169	NA	DC/CTD	EOL	29	08/11/2014	22:42	48.9	387630.83	6533069.2	58.92270	-4.95273	59
1714S_SBR_RSS100_S170	NA	DC/CTD	SOL	1	08/11/2014	23:09	47.4	388330.82	6533371.9	58.92555	-4.94066	56
1714S_SBR_RSS100_S170	NA	DC/CTD	EOL	30	08/11/2014	23:19	49.9	388119.54	6533409.8	58.92580	-4.94432	60
1714S_SBR_RSS90_S171	NA	DC/CTD	SOL	1	08/11/2014	23:52	49.8	390136.67	6531129.1	58.90611	-4.90803	61
1714S_SBR_RSS90_S171	NA	DC/CTD	EOL	32	09/11/2014	00:02	48.4	389823.03	6531196.3	58.90661	-4.91338	53