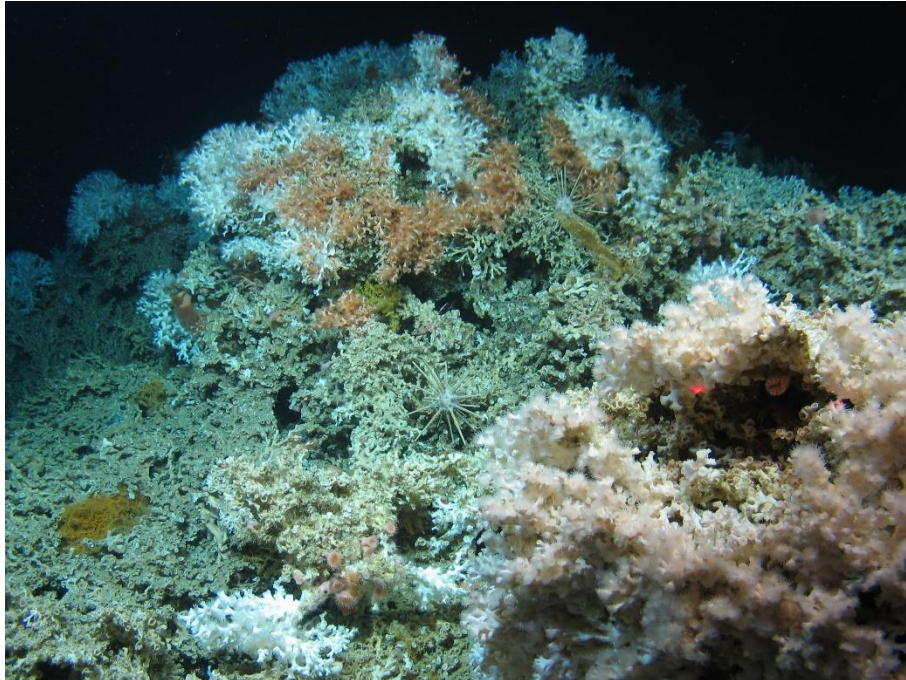


Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)



**RV Celtic Explorer and ROV Holland 1 - Cruise Number
CE18011**

Galway - Porcupine Bank Canyon - Galway

27th July 2018 to 11th August 2018

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Executive Summary

This survey focuses on a deep-water coral-dominated canyon system, the Porcupine Bank Canyon, NE Atlantic. Both cold water corals (CWC's) and submarine canyons have received considerable attention in recent years both from the general public and in deep-water scientific research. CWC's generate three-dimensional, structural habitats that form hot spots of biodiversity on continental margins and record changes in our environment. The primary objectives of the survey are to: a) acquire multi-resolution seabed mapping data; b) acquire precision core material from a variety of coral habitats; c) image the full spectrum of coral habitats within the canyon and; collect water and bio-samples at strategic locations throughout the canyon.

Previous mapping data of the canyon carried out by the Irish National Seabed Survey (1999 - 2006) is of too low a resolution (>25 m) to image the coral habitats throughout the canyon. Here, we have remapped the canyon at several resolutions to assess the distribution of these habitats as well as the sedimentological processes acting upon them. High-resolution ROV-multibeam also revealed the distribution of slope deposits and potential processes by which sediments can be transported into the basin from the canyon flank.

A transect of ROV-guided vibro cores were collected along the canyon lip where there is a gradation from coral mounds to coral gardens. A second transect of cores were collected from the deep basin, the pro-slope and up the canyon face. The retrieved core material will be subjected to a series of multiproxy analytical techniques (UCC) to assess the role of canyon processes on coral habitat development through time.

Bio-samples and video were collected as a cross-transect (deep canyon to canyon lip). Video shows that the canyon lip to the southeast hosts very large coral reefs with evidence of Wilson rings (Wilson, 1979), a phenomenon that has rarely been reported. This data will feed directly into a project (UCC) which assess the spatial patterns of coral habitats within the canyon and their responses to environmental parameters on a local-scale.

Water samples have been collected by the ROV and CTD rosette at a number of water depths, in particular, around the coral habitable zone (-600 m to -1000 m). These samples have been treated and stored for analysis of Particulate Organic Matter (UCC) and the effects of Ocean Acidification (NUIG) on coral habitats.

Background

Cold-water coral habitats are important centres of biodiversity in deep-seas that are subject to international conservation efforts including designation as Special Areas of Conservation in Irish waters. However, despite their significance we have a limited understanding of how these reefs grow and respond to changes in environmental conditions, although research shows they are strongly influenced by abiotic (allogenic) factors (Roberts *et al.*, 2009; Wheeler *et al.*, 2007; Lim *et al.*, 2018; Mienis *et al.*, 2007). In order to manage these systems, we must understand their natural dynamics and vulnerability to environmental pressures. Recent work on the Irish Porcupine Bank Canyon (PBC), a natural laboratory isolated from terrigenous input, has revealed extensive speciose, high biomass cold-water coral (CWC) structural habitats protected under the EU Habitats Directive (Wheeler and shipboard party, 2015; 2016).

Data from this survey feeds directly into a UCC Marine Geology Research Group, SFI-, GSI- and MI-funded project entitled Mapping, Modelling and Monitoring Key Controls and Processes on cold water coral habitats in Submarine Canyons (MMMonKey_Pro). The project aims to explore and monitor the PBC-CWC habitats and relate to ocean-climate environmental dynamics. For this, we require ROV-based multibeam bathymetry and novel 3D photogrammetric approaches for geostatistical analysis (collected during CoCoHaCa I, 2017) and habitat characterisation. Monitoring of canyon hydrodynamic and sedimentary processes, and core analysis will reveal the process thresholds defining coral sub-habitats' limits, in space and time, and allow predictive CWC, and habitat sensitivity, models to assist marine spatial planning. By assessing the magnitude of existing anthropogenic impacts within the constraints of the sensitivity model, recommendations can be extrapolated from the data for sustainable, responsible intervention in these habitats for fisheries and hydrocarbon exploration. Likewise, process thresholds will reveal the potential impact-response from climate change facilitating knowledge-based recommendations for effective management. This project adds to Irish seabed mapping capacity, develops a critical mass to generate large consortia, building further capacity and relationships with industrial (hydrocarbon)/international partners.

MMMonKey_Pro adopts a habitat-approach based study of the upper Porcupine Bank Canyon in order to understand the controls on the biodiverse and high biomass cold-water coral habitat that flourishes there. This habitat has a major impact on canyon-wide processes and is itself controlled by canyon hydrodynamics. Understanding the interaction between canyon abiotic controls and ecosystem response will better allow us to responsibly interact with this valued ecosystem and enact effective management policies within a changing world.

VOCAB (Ocean Acidification and Biogeochemistry: variability, trends and vulnerability) is a 4 year project funded under the Marine Research Programme 2014-2020, and runs from February 2017 to January 2021 (PI Dr Rachel Cave, NUIG). The aim of this project is to address some of the current gaps in our knowledge of the vulnerability and variability of selected marine ecosystems in Irish waters to ocean acidification (OA), by exploring some of the complex biogeochemical processes occurring at fine scales in selected ecosystems, and by studying the larger scale biogeochemistry of ocean waters impinging on those ecosystems. The objective with the collaboration with the CoCoHaCa 2 survey is to look at the chemical makeup of the different water masses within the submarine canyons of the Porcupine in terms of dissolved inorganic carbon, total alkalinity, dissolved oxygen and nutrients, from there we can devise the potential implications ocean acidification could have on submarine cold water corals.

The Porcupine Bank Canyon, in Irish waters 370 km SW of Mizzen Head, is disconnected from terrigenous influences being isolated from river and across shelf sediment/watermass influences. Unlike all other European submarine canyons, the Porcupine Bank Canyon and its smaller neighbours, represent a natural laboratory for studying oceanographic changes unimpaired by changes in the terrestrial (human dominated) environment. Significant deep-sea exploration and surveying has established baseline data revealing a major carbonate-dominated upper canyon system (RTE 9 O' Clock News, 16th July 2015) hosting extensive heterogeneous cold-water habitat cover.

Survey Objectives and Cruise Track

The research cruise has a number clearly-defined scientific objectives:

1. **Local-scale, high-resolution mapping:** The shallow-water EM2040 multibeam echosounder will be integrated on the Holland 1 ROV (technique has been tried and tested on preceding CoCoHaCa I and QuERCI I surveys, 2015 and 2017 respectively) with a real-time sound velocity probe, an IXSea INS (Inertial Navigation System) and RDI workhouse DVL (doppler velocity logger). The ROV will be flown at approx. 100 m off the bottom to achieve a swath of approx. 300 m at a resolution of ~1 m. Survey lines will overlay previously existing ROV-video lines throughout the canyon (from canyon base to canyon summit and along the canyon head/lip). All data will be acquired and managed via SIS (Seafloor Information System) saved as *.all files. Data will be processed online using Fledermaus Qimera.
2. **Regional-mapping:** Using the hull-mounted EM302 multibeam echosounder, complete mapping coverage of the 10m canyon bathymetric and backscatter grid will be completed (existing coverage from QuERCI surveys is incomplete). Initially, a sound velocity profile of the water column will be taken using a sound velocity probe. This will calibrate the EM302 beams for the sound-speed variations specific to the canyon. The area will be surveyed typically parallel to contour lines over the canyon ensuring a minimum of 25% line overlap. All data will be acquired and managed via SIS (Seafloor Information System) saved as *.all files. Data will be processed online using Fledermaus Qimera.
3. **Water sampling and CTD's:** A series of water samples will be taken via the Niskin bottles on the CTD rosettes and Niskin bottles stored within the ROV bio-boxes. On the CTD rosette, bottles will be fired below the mixed layer, 500 m water depth, 100 m above the coral habitat zone, every 100 m through the coral habitat zone, 100 m below the coral habitat zone and near the benthic boundary layer. The bottles in the ROV bio-boxes will be fired when within a coral habitat. Once onboard samples will be filtered for particulate organic matter and treated with various chemicals to test for dissolved oxygen (DO), dissolved inorganic carbon (DIC), nutrients and salinity. CTD casts will be taken with the CTD rosette at various locations throughout the canyon and with the ROV during its to the bottom (for SVP calibration of the ROV-mounted multibeam) during lines and on ascent to the surface.

4. **ROV Vibrocoreing:** Using the ROV-vibrocore, the ROV will navigate to areas of known coral occurrence (based on previously collected video data) and target specific parts of coral mounds, off-mound areas, on the canyon lip and canyon base. Ten vibrocores will be taken at a time (typical of the Holland 1 ROV). Cores will be taken on board, labelled accordingly and stored at 4°C.
5. **ROV video and sampling:** Using the EM302 data acquired during this survey, we will ground truth coverage with video and opportunistic sampling of corals and associated organisms. High Definition video data will be acquired and stored as *.mov files (Quicktime format). ROV samples will be retrieved via ROV manipulator arms and stored within the bio boxes until recovery to surface. These samples will be stored in a solution of 97% ethanol or 70% ethanol and 30% seawater.



Cruise transit map

Equipment

RV Celtic Explorer

The RV Celtic Explorer is a 65.5 m multi-purpose research vessel. The vessel has wet, dry and chemical laboratories, which are permanently fitted with standard scientific equipment and can accommodate 20-22 scientists along with 13-15 crew who are highly skilled with the handling and deployment of scientific equipment. It has a maximum endurance of 35 days. The Celtic Explorer is equipped with two Trimble 300-D GPS' and has Dynamic Positioning. The aft deck has a 25 tonne "A-frame" with a 4 m outward and inward reach in addition to a 3 m, 10 tonne starboard T-frame. The ship also comprises of a midship, forward and aft crane as well as a 6 tonne CTD winch.



The RV Celtic Explorer

Holland 1 ROV

The Holland 1 ROV (remote operated vehicle) is a platform for capturing underwater remotely-sensed data of the seabed and transmitting this data as a live to the scientists aboard the vessel. It is depth-rated to 3000 m and has 100 hp with a maximum speed of 3 knots. An EM2040 multi-beam echo sounder is mounted on the vehicle for high-resolution bathymetric mapping of the seabed. The EM2040 operates at 200 - 400 kHz and is effective to 600m. The Holland I also has a HDTV camera, low resolution cameras and a HD digital stills with laser ranging scales. It is also fitted with a CTD and 2 robotic arms for sampling (1X7F and 1X5F) as well as an aspirator.



The Holland 1 ROV

Kongsberg EM2040 Multibeam Echosounder

The Kongsberg EM2040 multibeam echosounder is a high-resolution sonar with wide-band composite transducers which can operate at 3 frequencies (200 kHz, 300 kHz, and 400 kHz), non-simultaneously. It is depth-rated to 6000 m. For this cruise, it is mounted on the Holland 1 ROV and integrated with a sound velocity probe, Sonardyne USBL, DVL and IXSea Inertial Navigation System. Acquisition is planned and managed via Kongsberg's Seafloor Information System (SIS) where it will be flown at approx. 100 m off the bottom at 200 kHz and at a survey speed of 0.4 knots.



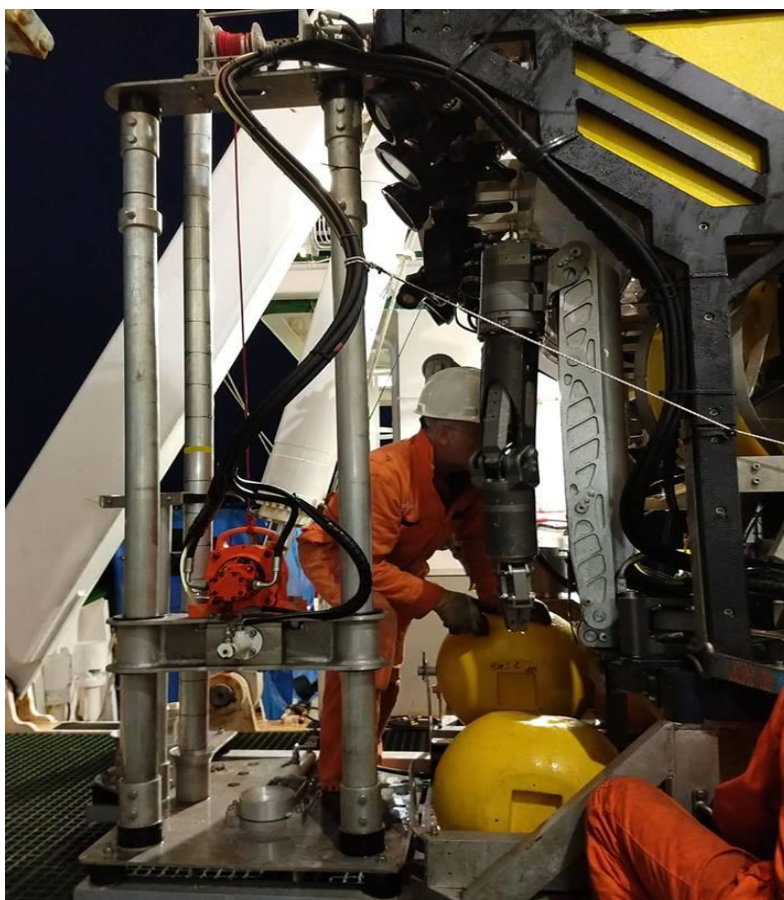
Kongsberg EM2040 mounted on the Holland 1 ROV

Kongsberg EM302 Multibeam Echosounder

The Kongsberg EM302 multibeam echosounder is deep-water sonar which operates at 30 kHz achieving an 8,000 m water depth range. It is mounted at the hull of the RV Celtic Explorer (not on the drop keel). It is integrated with a sound velocity probe, C-Nav navigation, a motion reference unit and a dedicated processing unit. All acquisition and planning is carried out in SIS.

ROV Vibrocore

The MBARI Vibrocorer is designed to retrieve core samples from water-saturated sediment from an ROV. This means targets can be accurately positioned both by USBL and visual observation. The corer can be vibrated at a range of frequencies which allows it to penetrate soft sediment on the seabed with minimal disturbance. The vibrocorer was developed by MBARI and fixed to the front of the ROV. Up to 5 core barrels can be stored on the rig and are loaded by the ROV manipulator arms.



The Vibrocore rig mounted on the ROV

CTD Rosette

A Sea Bird Electronics SBE 911 plus CTD was used to measure variations in a variety of parameters in the water column. The CTD was fitted with the following sensors: SBE 35 Digital Thermometer, a SBE44plus conductivity sensor, a Digiquartz pressure sensor, a SBE 43 dissolved oxygen sensor, altimeter, fluorometer and a nitrogen saturation sensor.



CTD rosette on deployment

Survey Log (UTC)

Galway

July 28th 2018

Mobilisation commences. Rockdrill not operational and is cancelled for the cruise. EM302 will not ping and cannot load background information. Restarted SIS and restarted computer. Informed technicians and ran SIS BIST test (passed). SIS pinged temporarily. Problem persisted.

Galway - Galway Bay

July 29th 2018

0505 Tie off and steam to Galway Bay (off Rossaveal). The EM302 (**0820**) would still not ping. Technicians and they ran a BIST (passed). Restarted the Processing Unit (PU) and the problem persisted). At **0915** technician is taking out EM302 power supply to put back in 1.5 hours later. **1200** EM302 power supply put back and tested but the problem remains. Run BIST (failed). To be tried again in deeper water >100 m (currently at 47 m). **1500** scientists fine-tuning the water chemistry, water filtering and CTD workflow. Multibeam calibration and patch test at **1600**. Noticed cross swath striping in the data during calibration, confirmed after processing the data. ROV crew required to take hours of rest (**1900**). ROV tech, Colin Ferguson, joined vessel (**2005**).

July 30th 2018

Steamed to 100 m water depth outside Galway Bay (**0100**) to trial the EM302 in deeper water and run BIST test (pass). ROV deployed at **0930** for multibeam testing. On processing, ROV multibeam data remained "striped". Chief ROV technician is liaising with Kongsberg regarding the issue. Applying various changes to ROV EM2040 installation parameters (**1000 - 2000**). ROV recovered to deck (**2000**). The multibeam data striping appears to as a result of the IXSea INS depth feed not being smoothed. Decided to stay in Galway Bay to apply to bypass the depth feed directly to the multibeam.

July 31st 2018

The ROV goes back in the water to test the new depth feed (**1100**). At **1230**, ROV back on deck and Chief ROV technician decided that the fix was not effective. The plan at this time is to review the MBES-INS integration on transit after IXSea respond whether to proceed with ROV-

MBES later in the cruise. Informed the bridge at **1240** of our intent to steam to the survey area with a view of completing a USBL calibration.

Galway Bay - Porcupine Bank Canyon

July 31st 2018

Leave Galway bay testing area to steam to target site (**1400**).

August 1st 2018

ROV stops on transit to trial the new depth feed for the EM2040 (**1530**). Multibeam data showed a roll error. Sent sample of data to Kongsberg. Start on transit again to the canyon (**1800**).

Porcupine Bank Canyon

August 1st 2018

Arrival at the Porcupine Bank Canyon at **20:30**. **Station 1** is an ROV Dive (**Dive 1, Station 1; CE18011_1**) at the south eastern flank of the canyon where the ROV is tested. ROV multibeam data does not show any significant errors and ROV is recovered to deck. ROV **Dive 2 (Station 2; CE18011_2)** is at **2355** to cover pre-existing ROV-video data (Line 1). The EM2040 is operated 400 kHz, 100 m off the bottom. Processing of the raw data shows that there are no significant roll-like artefacts.

August 2nd 2018

Dive 2 ends at **0623** (ROV on deck). Transit to start of next line. ROV in water for **Dive 3 (Station 6; CE18011_6)** at **0735**. On route down, ROV CTD stopped at approx. 635 m water depth and restarted (saved as 2 files). EM2040 data acquired for **Dive 3** (Line 2). Noticed some minor roll artefacts on processing. This appears to be related to tension on the ROV umbilical. Near the end of the line, the connection with the EM2040 sonar head was lost. ROV recovered to deck (**1503**). Steamed towards the next survey line. ROV in water for **Dive 4, station X (Line 3)** at **1655**. On ROV decent, the CTD cast recorded anomalous data values and was therefore cut into 3 separate files which are converted to a single SVP. EM2040 recorded data for Line 4, up canyon face, through coral habitable zone to beyond the canyon lip. ROV recovered to deck (**2140**). At next station (**Line 4, Dive 5**) and ROV in water at **2218**. EM2040 recorded data for Line 4, up canyon face, through coral habitable zone to beyond the canyon lip.

August 3rd 2018

ROV back on deck at **0552**. Logged hull-mounted EM302 on transit to next station. ROV in water at the next station for **Dive 6 (CE18011_15; Line 5)** at **0636**. ROV on deck and move to next station at **1110**. ROV in water for **Dive 7 (CE18011_16; Line 6)** at **1152**. EM2040 recorded data for Line 4, up canyon face, through coral habitable zone to beyond the canyon lip. ROV back on deck at **1541** and steam for next station. ROV in water at next station (**CE18011_17**) for **Dive 8** at **1630**. EM2040 recorded data for Line 4, up canyon face, through coral habitable zone to beyond the canyon lip. ROV back on deck at **2114** and steam for next station. ROV in water at next station (**CE18011_19**) for **Dive 9 (Line 8)** at **2144**. EM2040 recorded data for Line 4, up canyon face, through coral habitable zone to beyond the canyon lip.

August 4th 2018

ROV back on deck at **0527** and steam to next station. ROV on station (**CE18011_23**) for **Dive 10** to acquire an ROV multibeam grid of the south eastern canyon flank and margin.

August 5th 2018

ROV multibeam grid complete and ROV back on deck at **0106**. Transit to next station (**CE18011_26**; hull-mounted EM302 multibeam grid). Acquire hull-mounted MBES throughout the canyon until **1350**. **Dive 11** starts for ROV vibrocoring at **1450** on the top of a coral mound above the south eastern canyon flank. The first vibrocore (**VC1**) was retrieved on the top of a coral mound at **1528**. **VC2** was retrieved off-mound at **1629**. **VC3** was retrieved off-mound at **1730**. **VC4** was retrieved from a coral garden at **1925** and **VC5** was also retrieved from a coral garden at **1937**. **Dive 11** ends and ROV back on deck at **2003** to recover the cores. ROV back in water for **Dive 12** at **2130** to continue the vibrocoring transect. **VC6** was retrieved at **2223** from near the centre of the canyon deep.

August 6th 2018

VC7 was retrieved from the pro-slope of the canyon at **0015**. **VC8** was retrieved from the canyon lower slope (coral tallus slope deposit) at **0255**. **VC9** was retrieved from the upper-mid canyon slope (coral tallus slope deposit) at **0337**. The Vibrocore rope snapped during acquisition of **VC9** and the remainder of the dive is abandoned. ROV back on deck at **0428**. Vessel moved to start of Hull-mounted EM302 survey grid (**CE18011_40**) at 0456. Acquired data on this grid until **1421** when the ROV is deployed back in water for **Dive 13** (video, water and bio-sampling). The ROV acquired video, CTD, bio-samples from the lower canyon segment to the south east. The ROV was back on deck at **2300**.

August 7th 2018

Started hull-mounted EM302 multibeam grid to map the canyon (**CE18011_60**) at **0020**.

August 8th 2018

Hull-mounted EM302 multibeam grid complete at **0103** and steam to first CTD station (CE18011_61; CTD cast 1) to arrive at **0508**. CTD cast 2 (CE18011_62) is complete at **0752**. CTD cast 3 (CE18011_63) is complete at **0916**. CTD cast 4 (CE18011_64) is complete at **1132**. CTD cast 5 (CE18011_65) is complete at **1252**. CTD cast 6 (CE18011_66) is complete at **1537**. CTD cast 7 (CE18011_67) is complete at **1736**.

Porcupine Bank Canyon - Northern Porcupine Seabight - Galway Bay

August 8th 2018

Steamed for north Porcupine Seabight multibeam line directly after (**1736**). Arrive on station (CE18011_68) at **2241**.

August 9th 2018

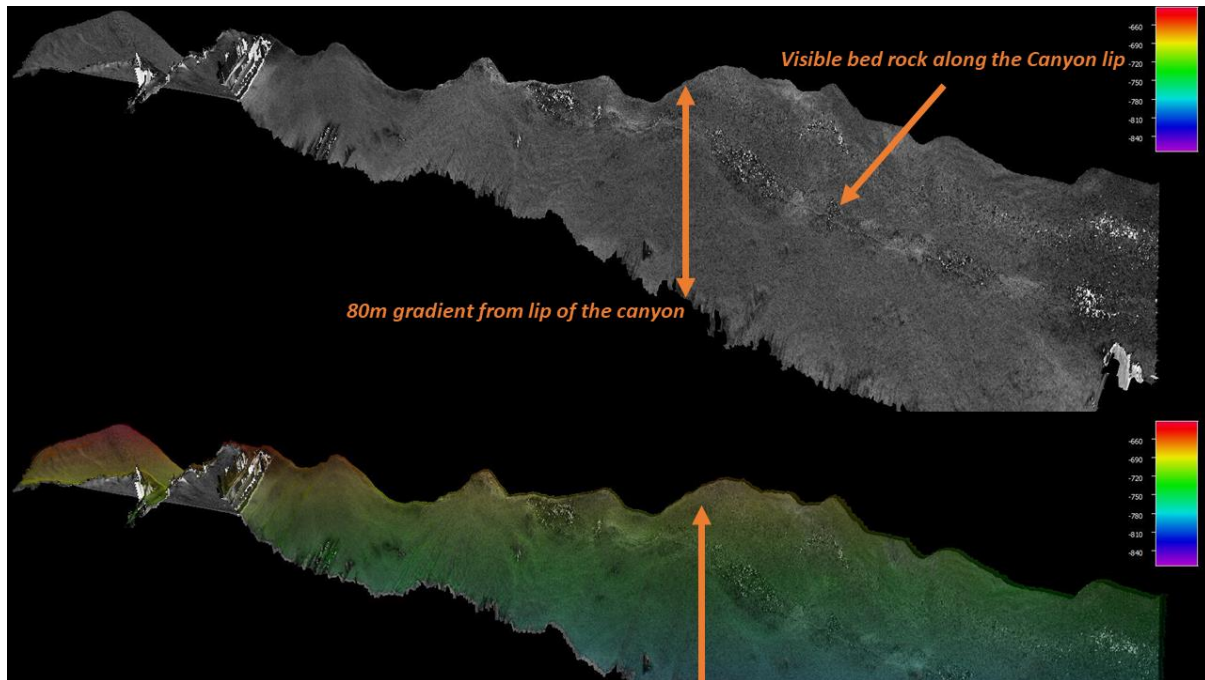
Line complete at **0923** and commence transit to Galway Bay.

August 10th 2018

Dock at **0400**. Survey ends.

Results Summary

Local Scale, High Resolution ROV-mounted EM2040 multibeam data

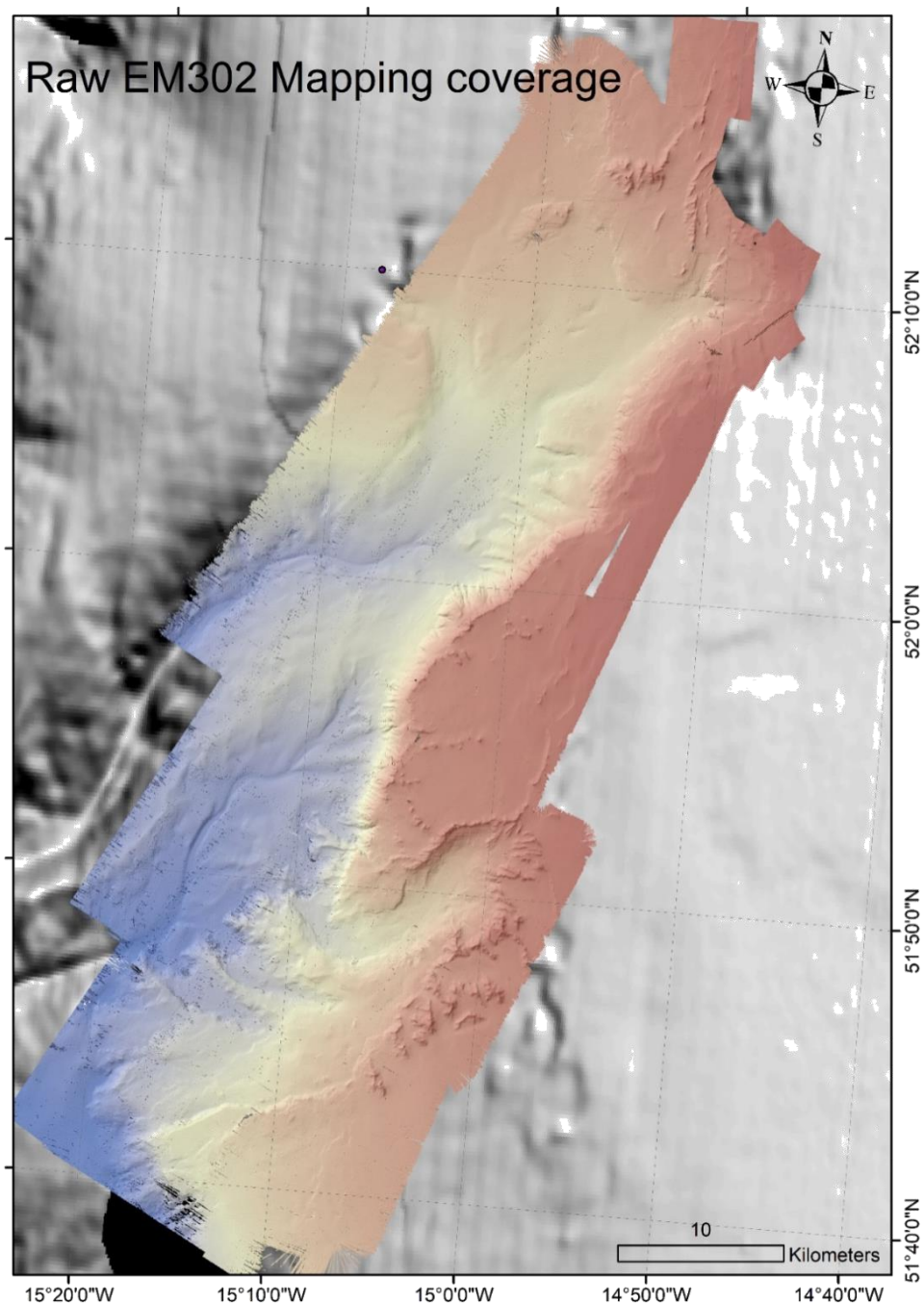


Sample raw ROV-mounted EM2040 backscatter and bathymetry data.

ROV-mounted multibeam data were acquired throughout the canyon as; a) a series of lines previously imaged by video and; b) as a grid through an area of interest. The lines extend through the coral habitable zone of the canyon (approx. -1000 m to -600 m), crossing the canyon base, up the canyon wall and over the canyon lip (see ROV multibeam dive map). These lines show the canyon face is steep (approx. 35 degree slope) and is covered by sediment, bedrock exposure and biogenic structures. On the lip, the coral mound features grow to >20 m in height above the canyon lip and appear to coalesce along the full later extent of the canyon lip.

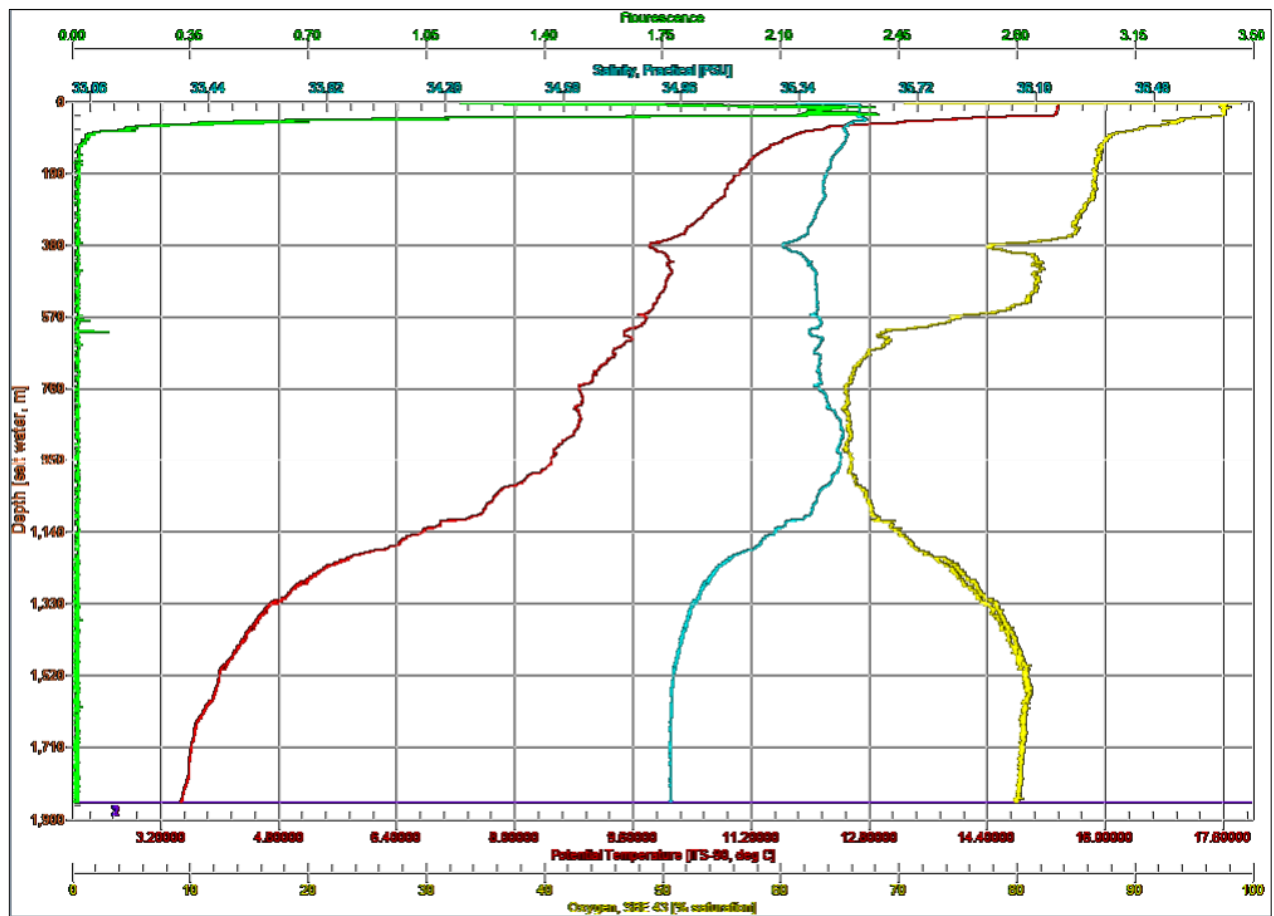
Regional-scale EM302 multibeam data

Porcupine Bank Canyon



Hull-mounted EM302 multibeam data covers an area of approx. 1,800 km². The bathymetric data reveals a near vertical 700 m high canyon flank (-600 m to -1300 m). The canyon flank has a 30 m tall lip which appears to be made of cold water coral reef. Further to the north these ridge features are smaller while towards the south, they have a propeller-like morphology and grow up to 200 m in height.

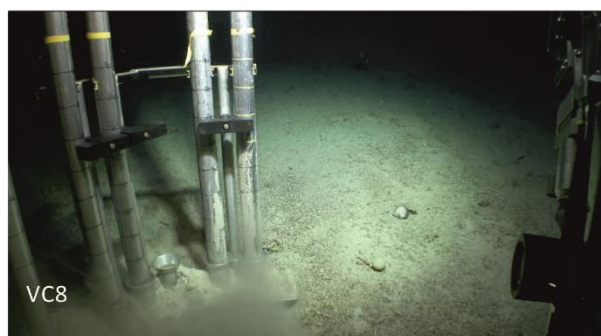
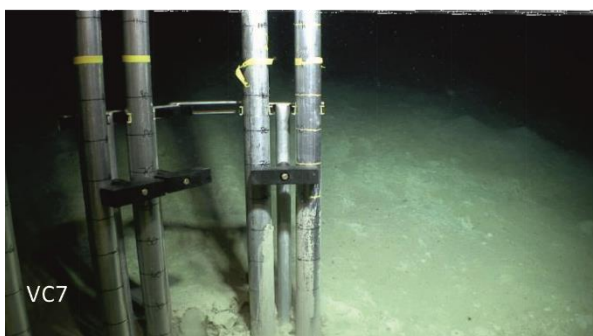
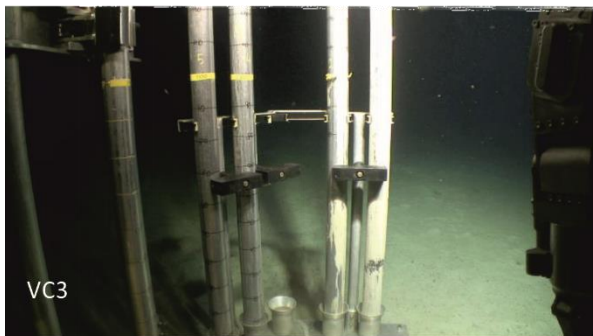
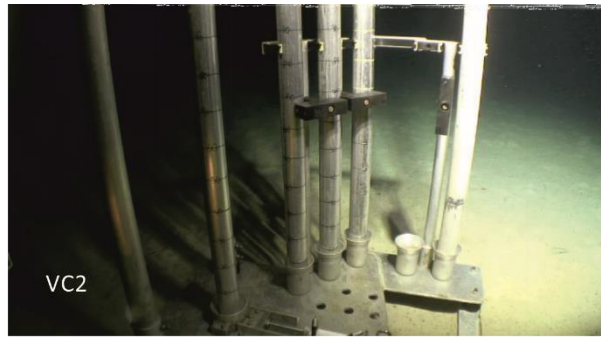
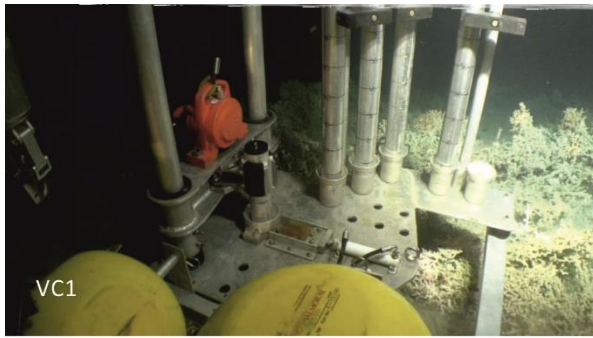
CTD profiles



Visual representation of raw conductivity, temperature and depth CTD data produced by the sensors on the SBE32 carousel

Typical CTD profiles from the canyon show a distinct obvious change in water masses, from the salinity and temperature, seen as blue and red respectively, once below the summer thermocline visible above 80 m. The first water mass present was Eastern North Atlantic Water ENAW which transitioned to Labrador Sea Water LSW at 1200 m. There is decrease in the percentage of dissolved oxygen, seen in yellow, within the coral habitable zone (600 to 1000 m).

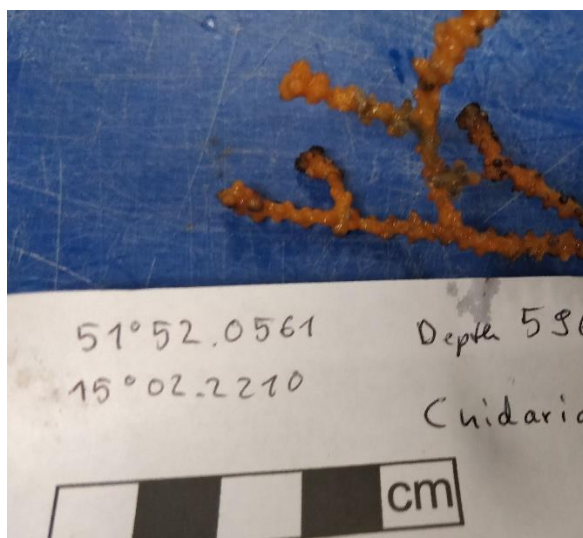
ROV Vibrocores



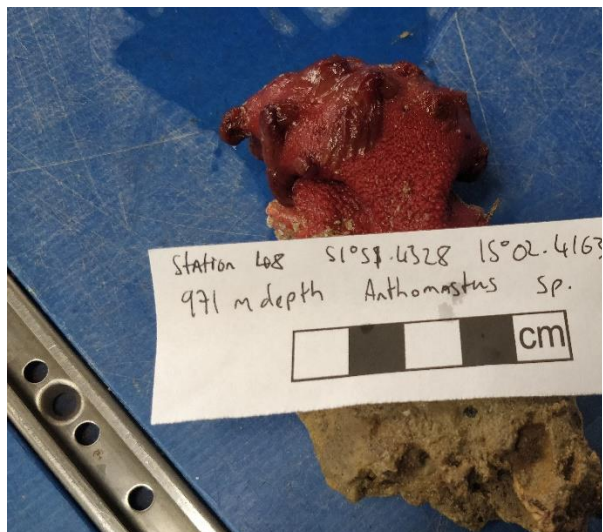
Vibrocore sites. Each core was manipulated into the vibrocorer unit and successively into the barrel holder by the Hollander 1. *Note: VC1-VC5: Dive 1. VC6-VC9: Dive 2.*

ROV Video and Bio-samples

Several mounds were observed (Dive 13) on the lip and within the canyon from the multibeam data. The main purpose of the dive to groundtruth the observations made on the multibeam data. Sediment dwelling organisms such as *Holothurian sp*, *Cidaris cidaris*, white Galatheide *sp*, *Octopoda sp*, *Rajidae* etc., were observed in off-mound areas. The corals occur between 600 - 1000 m depths. Coral rubble and sparsely growing low-lying *Lophelia/Madrepora* were observed on the flanks of the mounds and actively growing dense aggregates of *Lophelia pertusa* at the summit. We also observed large stocks of fish (about 10 cm in length) on coral habitats, and squids mainly at off mound areas. Other commonly observed black corals include *Leiopathes sp*, *Antipathes sp*, *Bathypathes sp* and *Stichopathes sp*. Sponge species observed were *Hexedella sp* and *Aphrocallistes beatrix*. The presence of fishing lines at 1123 m water depth evidenced fishing activities in the canyon despite the fact that the Porcupine Bank Canyon is designated as Special Area of Conservation (SAC). However, these lost lines served as substrate for certain unidentified coral species (Figure 1). Several other biological samples were collected for further analysis during the video dive. Collected samples were stored in 70% ethanol on board.



Unidentified Cnidaria sp sampled for further taxonomic analysis



Anthomastus sp



Antipathes sp and associated crinoid sp



Dense lophelia coverage along the canyon lip

Appendices

Personnel

Scientific Team

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Siobhán Burke
Luke O' Reilly
Andy Wheeler
Kimberley Harris
Luis Conti
Gerard Summers
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Night shift leader
Senior Marine Geologist
Marine Geoscientist
Marine Geoscientist
Marine Geoscientist
Marine Ecologist
Marine Biologist
Marine Scientist
Oceanographer
Marine Geoscientist
Visual Artist



Photo credit: Carol Anne Connolly

ROV Team

Patrick O' Driscoll
Colin Ferguson
Karl Broderick
Will Handley
George Findlay
Rob Carpenter

ROV Superintendent
ROV Night Shift Leader
ROV Technician
ROV Technician
ROV Technician
ROV Technician

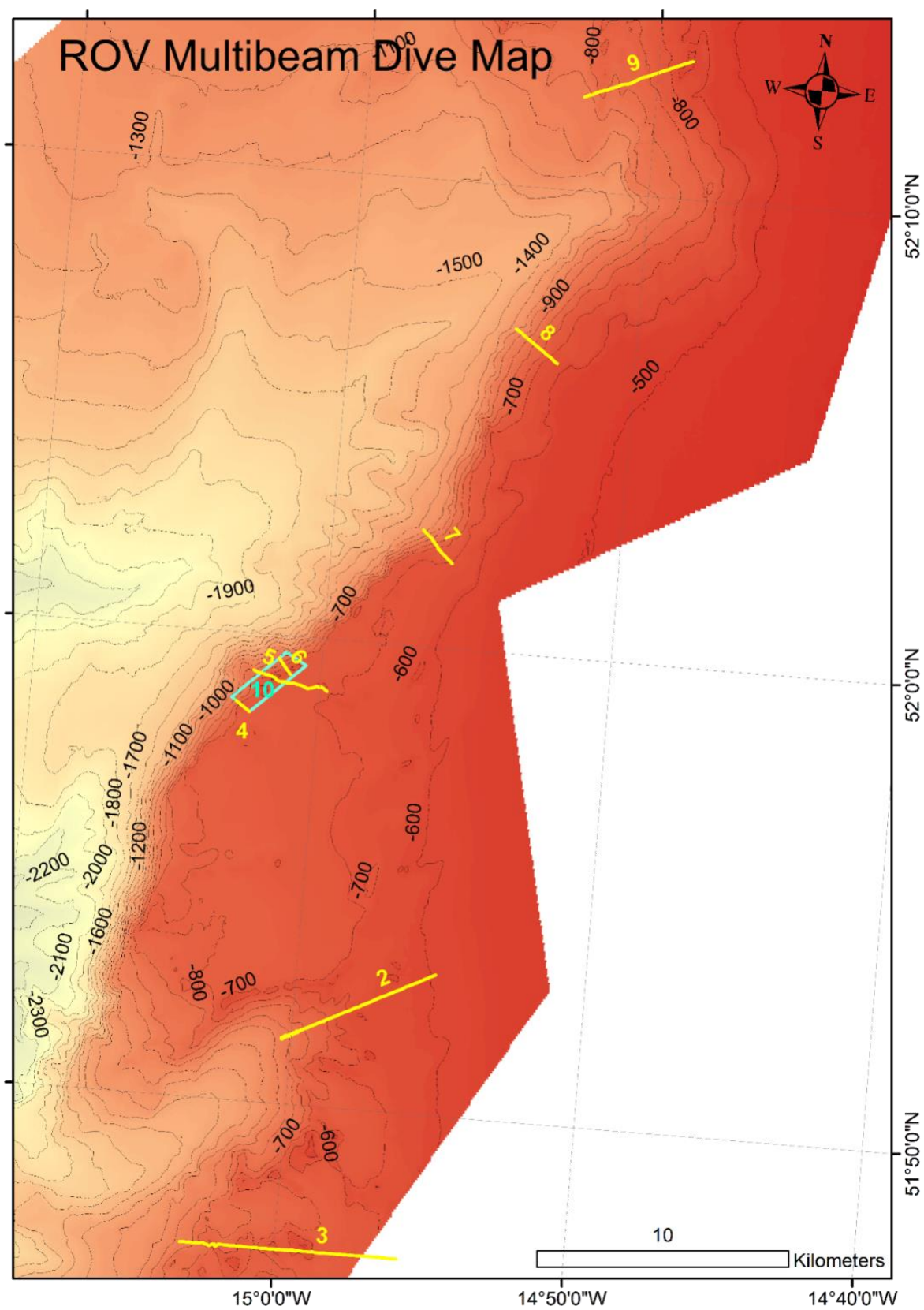
Crew

Denis Rowen
Damien McCallig
Kenny Downing
Paul Murphy
Dave Stack
Michael Slyne
Frank Kenny
Jimmy Moran
Shane Horan
Tom Gilmartin
Tommy Grealy
Liam Murphy
Dylan Ward
Noel O' Driscoll
Maurice Murphy
Marc O' Connor

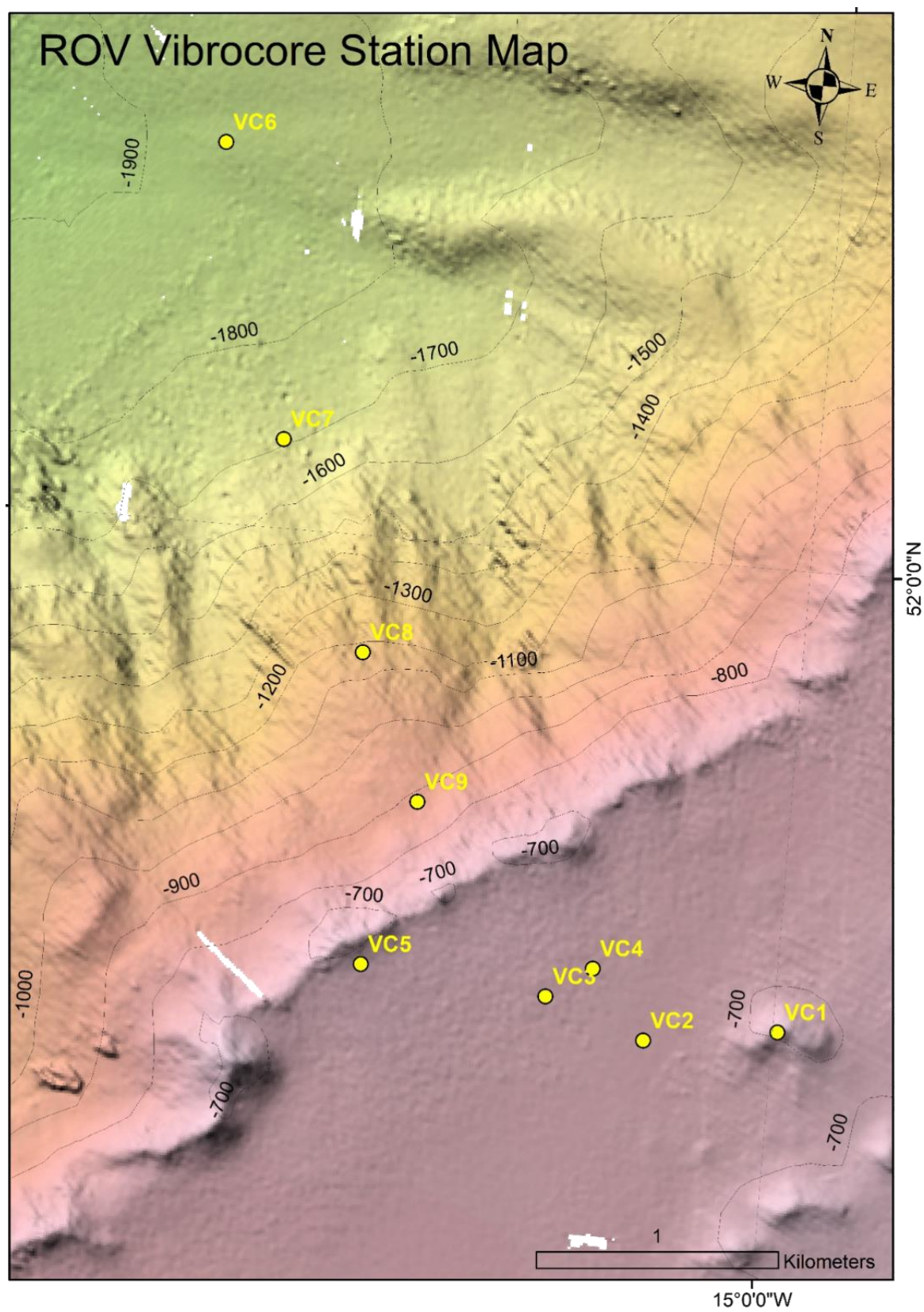
Master
Chief Engineer
C/O & Security Officer
2nd/O & Security Officer
Second Engineer
ETO
Bosun
Cook
Bosuns Mate
AB Deckhand
AB Deckhand
Technician
AB Deckhand
AB Deckhand
Assistant Cook
Technician

Stations (Logs and maps)

ROV Multibeam Dives



ROV Vibrocore Stations



CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

Core	Dive	Station	Lat	Long	Depth (m)	Length (m)	Comment
VC1	11	28	51°58.9729	14°59.9719	660	1.43	Coral mound east of canyon lip. Slight loss of sediment from core catcher during acquisition. Rig lifted during drill, inhibiting >1.4m to be retrieved. Light brown/greys visible in cores. Coral pieces in bagged sample.
VC2	11	29	51°58.9306	15°00.4519	731	0.8	Off mound setting. Homogenous sediments. Lost some sediments from bottom of core during acquisition. Top of core (0-10cmbsf) composed of olive grey very fine sands and silts. 50-60 cmbsf consists of a coarser orange-brown sand unit. 60-80 cmbsf consists of orange-brown muds.
VC3	11	30	51°59.0103	15°00.8165	722	0.5	Off mound setting. Heterogenous sediments. Throughout succession of core, sediments are composed of very fine olive grey and orange brown units of sands and silts. Core catcher showing sandy contents and minor black angular sediments
VC4	11	31	51°59.0804	15°06.5420	671	1.8	Coral garden 1. Large pieces of Lophelia (<4cm) present in top of core. 0-40cmbsf and 50-180cmbsf composed of olive grey muds and silts. At 40-50cmbsf, coarser sand unit noted. At base of section (i.e 180 cmbsf), bagged sample composed of white calcareous muds.
VC5	12	32	51°59.0481	15°01.4890	699	1.23	Coral garden 2. Directly at boundary between coral mound and bank sediments. Sediment leakage from top of core during acquisition. At depths of 160 cm, very resistant. Core showing 0-30cmbsf composed of light brown muds. From 30-70cmbsf, orange brown sands fine downwards. 75-120cmbsf composed of yellow-brown muds.
VC6	12	35	52°00.8461	15°02.2188	1857	0.5	Deep sea setting. Hit consolidated layer/object at 0.7 m. 0-40 cmbsf consisting of olive grey muds with traces of black and orange mottling. At 40 cmbsf sediments progress into coarser sands and shelly hash until the remainder of the core. High biogenic component present.
VC7	12	36	52°00.1980	15°01.9231	1716	0.13	Pro-slope locality. Sediment vented extensively through core during vibrocoreing. In the core, at 13cmbsf, sediments are composed of olive grey muds which darken upwards to dark grey muds.
VC8	12	37	51°59.7397	15°01.5749	1202	0.33	Tallus slope locality 1. Cored at change in water mass according to ROV CTD unit. Core showed a fining upwards sequence. In 33-20 cmbsf sediments were coarse with high biogenic content. 20-5 cmbsf was relatively finer with a similar sedimentary content. Video footage showed large tallus deposits (>4cm) on the surface.
VC9	12	37	51°59.4185	15°01.3343	902	0	Tallus slope locality 2. ~22 m NW downslope from ledge. Hit hardground within first 10 cm of acquisition. Sediments were bagged when ROV returned to surface due to the insufficient amount retrieved.

Vibro core station log

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

Multibeam Station Log

Station Log: Multibeam				Coordinates			
Station #	Start Line #	Time (UTC)	Date	Lat DD	Long DD	MBES kHz	Notes
CE18011_2	54	22:18	01.08.2018	51.880	-15.016	200 kHz	Test line. SOL
CE18011_2		22:23	01.08.2018	51.881	-15.016	200 kHz	EOL
CE18011_2	55	22:24	01.08.2018	51.881	-15.016	200 kHz	Test line. SOL
CE18011_2		22:24	01.08.2018	51.881	-15.016	200 kHz	Test line. EOL
CE18011_4	56	01:17	02.08.2018	52.874	-15.004	400kHz	SOL 0056
CE18011_4		05:47	02.08.2018	51.876	-15.945	400 kHz	EOL 0061
CE18011_6	62	08:45	02.08.2018	52.303	-15.091	400 kHz	SOL 0062
CE18011_6		08:50	02.08.2018	52.303	-15.089	400 kHz	Stopped pinging
CE18011_6	63	08:50	02.08.2018	52.303	-15.089	400 kHz	SOL - Start pinging again
CE18011_6	63	09:45	02.08.2018	52.303	-15.068	400 kHz	Line cut
CE18011_6	64	10:42	02.08.2018	52.303	-15.043	400 kHz	Line cut
CE18011_6	65	11:42	02.08.2018	52.303	-15.016	400 kHz	Line cut
CE18011_6	66	12:43	02.08.2018	52.303	-15.166	400 kHz	Line cut
CE18011_6	67	13:46	02.08.2018	52.303	-16.628	400 kHz	Line cut
CE18011_6	68	14:35	02.08.2018	52.303	-16.606	400 kHz	Link to MBES lost - EOL
CE18011_6		14:35	02.08.2018	52.303	-16.608	400 kHz	Not pinging - EOL
CE18011_7	69	18:10	02.08.2018	52.611	-15.106	400 kHz	SOL 0069 - logging
CE18011_7			02.08.2018	52.620	-15.006	400 kHz	EOL0071
CE18011_10	72	23:31	02.08.2018	52.002	-15.044	400 kHz	SOL0072
CE18011_10		00:05	03.08.2018	51.998	-15.040		EOL-Turn
CE18011_11	73	00:05	03.08.2018	51.998	-15.040	400 kHz	SOL-0073
CE18011_11		00:29	03.08.2018	51.994	-15.040		EOL-0073 issue with ROV
CE18011_12	74	00:36	03.08.2018	51.911	-15.040	400 kHz	SOL-0074
CE18011_12	74	01:37	03.08.2018	51.987	-15.039	400 kHz	EOL-0076
CE18011_13	77	01:41	03.08.2018	51.987	-15.039	400 kHz	SOL-077
CE18011_13	81	05:14	03.08.2018	51.982	-14.995		EOL-081
CE18011_14	4	05:56	03.08.2018	51.988	-15.002	Auto	SOL 302 multibeam (200Hz)
CE18011_14	4	06:11	03.08.2018	52.004	-15.034		EOL 302 multibeam (transit MBES Hull mounted)
CE18011_14	82	07:47	03.08.2018	55.350	-15.032	400 kHz	SOL
CE18011_15	83	09:29	03.08.2018	51.992	-15.025	400 kHz	Line cut
CE18011_15	83	10:26	03.08.2018	51.987	-15.018	400 kHz	EOL-Stop logging
CE18011_16	84	12:06	03.08.2018	52.042	-14.947	400 kHz	Pinging
CE18011_16	84	12:44	03.08.2018	52.042	-14.948	400 kHz	Pinging
CE18011_16	84	12:55	03.08.2018	52.042	-14.948	400 kHz	SOL-Logging
CE18011_16	85	13:55	03.08.2018	52.038	-14.941	400 kHz	Line cut
CE18011_16	85	15:08	03.08.2018	52.031	-14.929	400 kHz	EOL-Stop logging
CE18011_17	86	17:20	03.08.2018	52.116	-14.904	400 kHz	
CE18011_17	86	17:22	03.08.2018	52.116	-14.904	400 kHz	

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE18011_17	86	17:49	03.08.2018	52.114	-14.904	400 kHz	
CE18011_17	87	20:22	03.08.2018	51.854	-15.037	400 kHz	EOL - 0089
CE18011_20	90	22:40	03.08.2018	51.854	-15.037	400 kHz	SOL 0900
CE18011_20	90	22:40	03.08.2018	51.854	-15.038	400 kHz	Issus with pitch at SOL
CE18011_20	102	05:01	04.08.2018	51.855	-15.038	400 kHz	EOL - 0102
CE18011_24	103	08:00	04.08.2018	51.855	-15.038	400 kHz	start logging
CE18011_24		08:14	04.08.2018	51.856	-15.039	400 kHz	SOL 103
CE18011_24	104	09:00	04.08.2018	51.857	-15.040	400 kHz	Line cut
CE18011_24	105	10:04	04.08.2018			400 kHz	Line cut
CE18011_24	105	10:29	04.08.2018			400 kHz	Auto heading stooped- vessel stopped
CE18011_24	106	10:38	04.08.2018	51.858	-15.041	400 kHz	cut line-moved back
CE18011_24	107	11:08	04.08.2018	51.859	-15.038	400 kHz	line cut-resume logging
CE18011_24	107	12:43	04.08.2018	51.859	-15.039	400 kHz	Line End
CE18011_24	108	13:25	04.08.2018	51.992	-15.012	400 kHz	SOL 0108
CE18011_24	108	15:00	04.08.2018	51.993	-15.013	400 kHz	Vessell stopped-moved back 250m
CE18011_24	109	15:12	04.08.2018	52.000	-15.031	400 kHz	Stopped Logging
CE18011_24	109	15:28	04.08.2018	51.977	-15.044	400 kHz	Logging Starts
CE18011_24	109	15:44	04.08.2018	51.981	-15.046	400 kHz	ROV stopped
CE18011_24	110	15:50	04.08.2018	51.977	-15.046	400 kHz	Stopped Logging
CE18011_24	110	15:55	04.08.2018	51.977	-15.046	400 kHz	Start logging
CE18011_24	111	16:05	04.08.2018	51.981	-15.038	400 kHz	Line cut (line bad - just logging transit)
CE18011_24	112	16:26	04.08.2018	51.981	-15.038	400 kHz	Line cut
CE18011_24	113	17:42	04.08.2018	51.986	-15.021	400 kHz	Line cut
CE18011_24	114	18:55	04.08.2018	51.992	-15.012	400 kHz	Line cut end of line
CE18011_24	115	19:09	04.08.2018	51.994	-15.012	400 kHz	Line cut
CE18011_24	116	19:20	04.08.2018	51.993	-15.013	400 kHz	SOL 0116
CE18011_24	118	23:33	04.08.2018	51.975	-15.044	400 kHz	EOL 118
CE18011_24	120	23:48	04.08.2018	51.977	-15.046	400 kHz	SOL 120
CE18011_24	120	01:06	05.08.2018	51.982	-15.038	400 kHz	EOL 120
CE18011_26	NA	05:19	05.08.2018	52.258	-14.933	400 kHz	SOL 0009
CE18011_26	NA	05:49	05.08.2018	52.190	-14.984	400 kHz	Line break (0009) due to ROV lift for VC outfitting
CE18011_26	NA	06:50	05.08.2018	52.182	-14.990	400 kHz	Line restarted - 0010
CE18011_26		08:58	05.08.2018	51.908	-15.193	400 kHz	Line cut
CE18011_26	NA	10:08	05.08.2018	51.771	-15.296	400 kHz	Line cut - New line 0013
			05.08.2018	51.771	-15.296	400 kHz	Start extended line. Captain following header as SIS lines not activating.
CE18011_26	NA	10:20	05.08.2018	51.748	-15.316	400 kHz	Possible gap in line. 0013 gap appeared behind vessel.
CE18011_26	NA	10:56	05.08.2018	51.683	-15.372	400 kHz	EOL Vessel stopped and rebooting system.

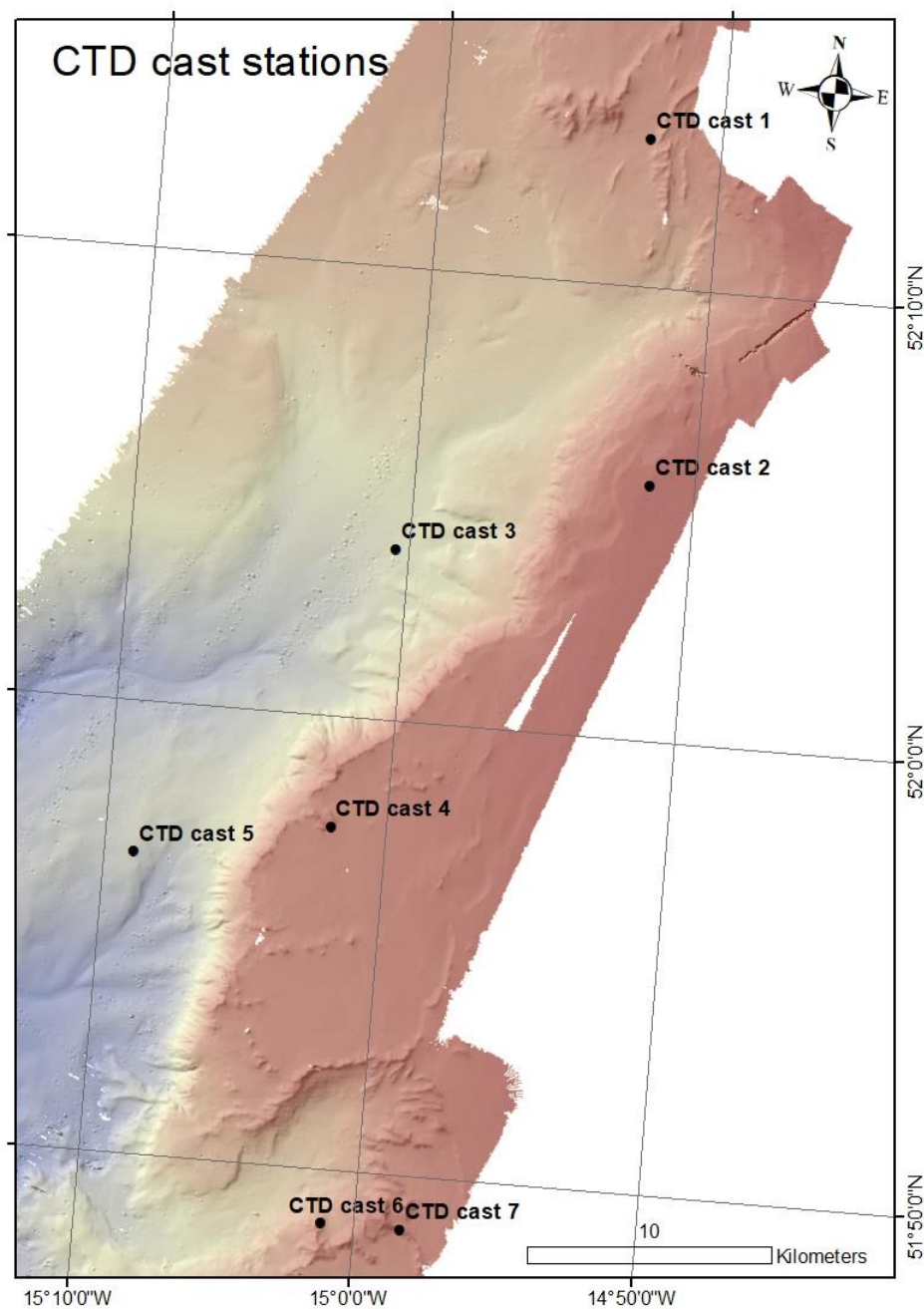
CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE18011_26	NA	11:13	05.08.2018	51.672	-15.374	400 kHz	System rebooted.
CE18011_26	NA	11:47	05.08.2018	51.652	-15.295	400 kHz	SOL - 0014 Logging.
CE18011_26	NA	13:50	05.08.2018	51.902	-15.089	400 kHz	EOL 0016-stop logging.
CE18011_40	NA	04:56	06.08.2018	52.176	-15.590	400 kHz	SOL 0017
CE18011_40	NA	06:39	06.08.2018	52.208	-14.777	400 kHz	EOL0017
CE18011_40	NA	06:48	06.08.2018	52.199	-14.765	400 kHz	False start 0018
CE18011_40	NA	06:48	06.08.2018	52.199	-14.765	400 kHz	SOL 0019
CE18011_40	NA	07:22	06.08.2018	52.127	-14.813	400 kHz	EOL 0019
CE18011_40	NA	07:24	06.08.2018	52.122	-14.815	400 kHz	stopped logging
CE18011_40	NA	07:45	06.08.2018	52.143	-14.770	400 kHz	SOL 0020
CE18011_40	NA	07:57	06.08.2018	52.156	-14.786	400 kHz	EOL 0020 Problem in bridge - needed to reboot system sis
CE18011_40	NA	08:07	06.08.2018	52.157	-14.788	400 kHz	started logging 0021
CE18011_40	NA	09:21	06.08.2018	52.281	-14.946	400 kHz	cut line 0021
CE18011_40	NA		06.08.2018			400 kHz	cut line 0022- corner
CE18011_40	NA		06.08.2018			400 kHz	system crash
CE18011_40	NA		06.08.2018			400 kHz	0023- crashed/turn
CE18011_40	NA	09:51	06.08.2018	52.276	-14.996	400 kHz	stop logging
CE18011_40	NA	09:52	06.08.2018	52.279	-14.993	400 kHz	stop logging
CE18011_40	NA	10:01	06.08.2018	52.277	-14.977	400 kHz	start logging 0023
CE18011_40	NA	12:40	06.08.2018	51.944	-15.263	400 kHz	stop logging 0024
CE18011_40	NA	13:05	06.08.2018	51.913	-15.232	400 kHz	start logging 0025
CE18011_60	NA	00:20	07.08.2018	51.922	-15.016	400 kHz	SOL 0026
CE18011_60	NA	00:46	07.08.2018	51.977	-14.990	400 kHz	EOL 0026
CE18011_60	NA	01:30	07.08.2018	51.893	-15.046	400 kHz	SOL 0027
CE18011_60	NA	03:40	07.08.2018	51.957	-15.214	400 kHz	EOL 0027
CE18011_60	NA	03:56	07.08.2018	51.639	-15.178	400 kHz	SOL 0028
CE18011_60	NA	06:22	07.08.2018	53.004	-14.939	400 kHz	EOL 0030
CE18011_60	NA	07:22	07.08.2018	51.039	-14.888	400 kHz	SOL 0031
CE18011_60	NA	08:02	07.08.2018	52.133	-14.820	400 kHz	EOL 0031
CE18011_60	NA	08:07	07.08.2018	52.135	-14.822	400 kHz	SOL 0032
CE18011_60	NA	12:23	07.08.2018	51.645	-15.132	400 kHz	EOL 0034
CE18011_60	NA		07.08.2018			400 kHz	line 0035 corner
CE18011_60	NA	12:36	07.08.2018	51.646	-15.101	400 kHz	SOL 0036
CE18011_60	NA	14:33	07.08.2018	51.875	-14.955	400 kHz	EOL 0036
CE18011_60	NA	14:48	07.08.2018	51.861	-14.931	400 kHz	Line 0037 corner
CE18011_60	NA	14:48	07.08.2018	51.861	-14.931	400 kHz	SOL 0038
CE18011_60	NA	15:50	07.08.2018	51.742	-15.017	400 kHz	EOL 0038
CE18011_60	NA	15:53	07.08.2018	51.738	-15.024	400 kHz	stop logging
CE18011_60	NA	17:51	07.08.2018	51.661	-15.328	400 kHz	SOL 0040-start logging
CE18011_60	NA	17:51	07.08.2018	51.661	-15.328	400 kHz	system crashed
CE18011_60	NA	18:15	07.08.2018	51.649	-15.340	400 kHz	SOL 0040
CE18011_60	NA	22:00	07.08.2018	52.086	-15.022	400 kHz	EOL 0041
CE18011_60	NA	22:30	07.08.2018	52.100	-15.091	400 kHz	SOL 0042

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE18011_60	NA	01:03	08.08.2018	51.803	-15.330	400 kHz	EOL 0043
CE18011_68	NA	08:34	08.08.2027	51.753	-11.697	400 kHz	Stopped logging
							Started logging again - confusion with andy about the line
CE18011_68	NA	08:34	08.08.2028	51.764	-11.408	400 kHz	
CE18011_68	NA	08:48	08.08.2029	51.753	-11.697	400 kHz	EOL 054
CE18011_68	NA	09:23	08.08.2030	51.800	-11.641	400 kHz	SOL 055

CTD cast stations



CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

Niskin Bottle Stations

CE18011	Station No: 61	Tick box for each sample type taken from Niskin						Vessel:	Celtic Explorer	Survey:	CE18011	Leg:	
Niskin	UID#	Depth	O2	DIC/TA	Salinity	Nutrients	Other	PSO:		Operator:	Aedin	Technician:	Mark + Liam
1	POR004	895	x	x	x	x		Station:	61	Cast No.:		Event No:	
2	POR004	895					x						
3	POR005	797	x	x	x	x							
4	POR005	797					x		Deck	Start	Bottom	End	Deck
5	POR006	696	x	x	x	x		Date:	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
6	POR006	696					x	Time [UT]	05:07	05:08	06:21	06:44	06:46
7	POR007	599	x	x	x	x		Lat (° N)	52°13.28	52°13.28	52°13.28	52°13.28	52°13.28
8	POR007	599					x	Long(° W)	14°52.58	14°52.58	14°52.58	14°52.58	14°52.58
9	POR008	500	x	x	x	x		Depth (m)		5	915.5	1.6	
10	POR008	500					x	Pressure		5.6	926	1.8	
11	POR009	401	x	x	x	x		Wire out (m)			4		
12	POR009	401					x						
13	POR010	55	x	x	x	x							
14	POR010	55											

CE18011	Station No: 62		Tick box for each sample type taken from Niskin						Vessel:	Celtic Explorer	Survey:	CE18011	Leg:	
Niskin	UID#	Depth	O2	DIC/TA	Salinity	Nutrients	Other		PSO:		Operator:	Aedin	Technician:	Liam
1	POR011	519	x	x	x	x			Station:	62	Cast No.:		Event No:	
2	POR011	519					x							
3	POR012	419	x	x	x	x								
4	POR012	419					x			Deck	Start	Bottom	End	Deck
5	POR013	320	x	x	x	x			Date:	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
6	POR013	320					x		Time [UT]	07:50	07:52	08:05	08:22	08:24
7	POR014	100	x	x	x	x			Lat (° N)	52°05.66	52°05.66	52°05.66	52°05.66	52°05.66
8	POR014	100							Long(° W)	14°51.61	14°51.61	14°51.61	14°51.61	14°51.61
9									Depth (m)		3	518	3.1	
10									Pressure		3.4	520	3.7	
11									Wire out (m)			2		

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE18011	Station No: 63	Tick box for each sample type taken from Niskin						Vessel:	Celtic Explorer	Survey:	CE18011	Leg:	
Niskin	UID#	Depth	O2	DIC/TA	Salinity	Nutrients	Other	PSO:		Operator:	Aedín	Technician:	Liam
1	POR015	1714	x	x	x	x		Station:	63	Cast No.:		Event No:	
2	POR015	1714											
3	POR016	1050	x	x	x	x							
4	POR016	1050					x		Deck	Start	Bottom	End	Deck
5	POR017	992	x	x	x	x		Date:	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
6	POR017	992					x	Time [UT]	09:13	09:16	09:52	10:38	10:40
7	POR018	894	x	x	x	x		Lat (° N)	52°03.80	52°03.80	52°03.80	52°03.80	52°03.80
8	POR018	894						Long(° W)	15°00.48	15°00.48	15°00.48	15°00.48	15°00.48
9	POR019	795	x	x	x	x		Depth (m)		3.2	1715	2.8	
10	POR019	795					x	Pressure		3.9	1736	3.3	
11	POR020	695	x	x	x	x		Wire out (m)			6		
12	POR020	695					x						
13	POR021	592	x	x	x	x							
14	POR021	592					x						
15	POR022	497	x	x	x	x							
16	POR022	497					x						
17	POR023	100	x	x	x	x							
18	POR023	100											

CE18011	Station No: 64		Tick box for each sample type taken from Niskin						Vessel:	Celtic Explorer	Survey:	CE18011	Leg:	
Niskin	UID#	Depth	O2	DIC/TA	Salinity	Nutrients	Other		PSO:		Operator:	Aedín	Technician:	Liam
1	POR024	523	x	x	x	x			Station:	64	Cast No.:		Event No:	
2	POR024	523					x							
3	POR025	398	x	x	x	x								
4	POR025	398					x			Deck	Start	Bottom	End	Deck
5	POR026	103	x	x	x	x			Date:	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
6	POR026	103					x		Time [UT]	11:30	11:32	11:48	12:03	12:05
7	POR027	60	x	x	x	x			Lat (° N)	51°57.57	51°57.57	51°57.57	51°57.57	51°57.57
8	POR027	60							Long(° W)	15°01.99	15°01.99	15°01.99	15°01.99	15°01.99
9									Depth (m)		5	523	3	
10									Pressure		5.2	529	3.3	
11									Wire out (m)			2		

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE18011	Station No: 65	Tick box for each sample type taken from Niskin						Vessel:	Celtic Explorer	Survey:	CE18011	Leg:	
Niskin	UID#	Depth	O2	DIC/TA	Salinity	Nutrients	Other	PSO:		Operator:	Aedin	Technician:	Liam
1	POR028	1853	x	x	x	x		Station:	65	Cast No.:		Event No:	
2	POR028	1853											
3	POR029	1100	x	x	x	x							
4	POR029	1100					x						
5	POR030	994	x	x	x	x							
6	POR030	994					x						
7	POR031	895	x	x	x	x							
8	POR031	895					x						
9	POR032	797	x	x	x	x							
10	POR032	797					x						
11	POR033	697	x	x	x	x							
12	POR033	697					x						
13	POR034	599	x	x	x	x							
14	POR034	599					x						
15	POR035	499	x	x	x	x							
16	POR035	499					x						
17	POR036	103	x	x	x	x							
18	POR036	103											

Deck	Start	Bottom	End	Deck
Date:	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Time [UT]	12:49	12:52	14:09	14:53
Lat (° N)	51°56.67	51°56.67	51°56.67	51°56.67
Long(° W)	15°08.94	15°08.94	15°08.94	15°08.94
Depth (m)		4	1853	5.4
Pressure		4.1	1878	6.2
Wire out (m)			15	

CE18011	Station No: 66	Tick box for each sample type taken from Niskin						Vessel:	Celtic Explorer	Survey:	CE18011	Leg:	
Niskin	UID#	Depth	O2	DIC/TA	Salinity	Nutrients	Other	PSO:		Operator:	Aedin	Technician:	Liam
1	POR037	1190	x	x	x	x		Station:	66	Cast No.:		Event No:	
2	POR037	1190											
3	POR038	994	x	x	x	x							
4	POR038	994					x						
5	POR039	894	x	x	x	x							
6	POR039	894					x						
7	POR040	796	x	x	x	x							
8	POR040	796					x						
9	POR041	696	x	x	x	x							
10	POR041	696					x						
11	POR042	597	x	x	x	x							
12	POR042	597					x						
13	POR043	82	x	x	x	x							
14	POR043	82											

Deck	Start	Bottom	End	Deck
Date:	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Time [UT]	15:34	15:37	16:09	16:45
Lat (° N)	51°49.65	51°49.65	51°49.65	51°49.65
Long(° W)	15°01.21	15°01.21	15°01.21	15°01.21
Depth (m)		3	1200	4.1
Pressure		3.4	1212	4.6
Wire out (m)			5	

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE18011	Station No: 66	Tick box for each sample type taken from Niskin						Vessel: Celtic Explorer	Survey: CE18011	Leg:	
Niskin	UID#	Depth	O2	DIC/TA	Salinity	Nutrients	Other	PSO:	Operator: Aedín	Technician: Liam	
1	POR044	618	x	x	x	x		Station: 67	Cast No.:	Event No:	
2	POR044	618									
3	POR045	598	x	x	x	x					
4	POR045	598					x				
5	POR046	498	x	x	x	x		Deck	Start	Bottom	End
6	POR046	498					x	Date: 08/08/2018	08/08/2018	08/08/2018	08/08/2018
7	POR047	71	x	x	x	x		Time [UT]	17:30	17:36	17:57
8	POR047	71						Lat (° N)	51°48.82	51°48.82	51°48.82
9								Long (° W)	14°58.37	14°58.37	14°58.37
10								Depth (m)		3.1	618
11								Pressure		3.9	623
								Wire out (m)			4

Dive Log

Dive	Date Time start	Date time end	Activity
1	01/08/2018 21:39	01/08/2018 23:05	ROV CTD, Test lines 0054 -0055
2	01/08/2018 23:52	02/08/2018 06:23	ROV CTD, Multibeam lines 0056 -0062
3	02/08/2018 07:35	02/08/2018 15:03	ROV CTD, Multibeam lines 0063 -0068
4	02/08/2018 16:51	02/08/2018 21:40	Rov CTD, Multibeam lines 0069 -0071
5	02/08/2018 23:19	03/08/2018 06:11	ROV CTD, Multibeam lines 0072 - 0081
6	03/08/2018 06:36	03/08/2018 11:10	ROV CTD, Multibeam lines 0082 - 0083
7	03/08/2018 11:52	03/08/2018 15:41	ROV CTD, Multibeam lines 0084 - 0085
8	03/08/2018 16:29	03/08/2018 20:57	ROV CTD, Multibeam lines 0086 - 0089
9	03/08/2018 21:44	04/08/2018 05:27	ROV CTD, Multibeam lines 0090 - 0103
10	04/08/2018 07:24	05/08/2018 01:06	ROV CTD, Multibeam lines 0104 - 0120
11	05/08/2018 14:50	05/08/2018 20:03	ROV CTD, VC 1-5
12	05/08/2018 22:00	06/08/2018 04:28	ROV CTD, VC 6-9
13	06/08/2018 14.21	06/08/2018 23.00	ROV Video, ROV CTD, Bio sampling

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

Water Filter Log

Station Number	Date	Time	Filter #	Initial ashed weight	Depth	Volume filtered	Lat	Long	Niskin #	ID
CE18011_61	08.08.2018	06:45	1	0.12513	985	3 Litres	52°13.29	14°53.57	2	POR 004
CE18011_61	08.08.2018	06:45	2	0.12562	797	2.4 Litres	52°13.29	14°53.57	4	POR 005
CE18011_61	08.08.2018	06:45	3	0.12441	696	1.5 Litres	52°13.29	14°53.57	6	POR 006
CE18011_61	08.08.2018	06:45	4	0.12502	599	2 Litres	52°13.29	14°53.57	8	POR 007
CE18011_61	08.08.2018	06:45	5	0.12548	500	2 Litres	52°13.29	14°53.57	10	POR 008
CE18011_61	08.08.2018	06:45	6	0.12437	401	2.5 Litres	52°13.29	14°53.57	12	POR 009
CE18011_61	08.08.2018	06:45	7	0.12312	55	2.5 Litres	52°13.29	14°53.57	14	POR 010
CE18011_62	08.08.2018	07:52	8	0.12519	519	2.5 Litres	52°05.66	14°51.61	2	POR 011
CE18011_62	08.08.2018	07:52	9	0.12389	419	1.5 Litres	52°05.66	14°51.61	4	POR 012
CE18011_63	08.08.2018	09:12	10	0.1251	1050	3.5 Litres	52°03.80	15°00.48	4	POR 016
CE18011_63	08.08.2018	09:12	11	0.12535	992	4 Litres	52°03.80	15°00.48	6	POR 017
CE18011_63	08.08.2018	09:12	12	0.12528	864	5 Litres	52°03.80	15°00.48	8	POR 018
CE18011_63	08.08.2018	09:12	13	0.12558	795	2 Litres	52°03.80	15°00.48	10	POR 019
CE18011_63	08.08.2018	09:12	14	0.12385	695	4 Litres	52°03.80	15°00.48	12	POR 020
CE18011_63	08.08.2018	09:12	15	0.12483	592	2 Litres	52°03.80	15°00.48	14	POR 021
CE18011_64	08.08.2018	11:32	16	0.12537	523	4 Litres	52°57.57	15°01.99	2	POR 024
CE18011_65	08.08.2018	12:52	17	0.12154	994	3 Litres	52°56.67	15°05.94	6	POR 030
CE18011_65	08.08.2018	12:52	18	0.12394	895	4 Litres	52°56.67	15°05.94	8	POR 031
CE18011_65	08.08.2018	12:52	19	0.12855	797	3 Litres	52°56.67	15°05.94	10	POR 032
CE18011_65	08.08.2018	12:52	20	0.128	697	4 Litres	52°56.67	15°05.94	12	POR 033
CE18011_65	08.08.2018	12:52	21	0.1229	599	2 Litres	52°56.67	15°05.94	14	POR 034
CE18011_66	08.08.2018	15:37	22	0.12707	994	3 Litres	51°49.65	15°01.21	4	POR 038
CE18011_66	08.08.2018	15:37	23	0.12529	894	5.5 Litres	51°49.65	15°01.21	6	POR 039
CE18011_66	08.08.2018	15:37	25	0.12357	696	5 Litres	51°49.65	15°01.21	10	POR 041
CE18011_66	08.08.2018	15:37	26	0.1251	597	2 Litres	51°49.65	15°01.21	12	POR 042
CE18011_66	08.08.2018	15:37	27	0.11546	796	2 Litres	51°49.65	15°01.21	8	POR 043
CE18011_67	08.08.2018	17:30	28	0.12318	618	4 Litres	51°48.82	14°58.37	2	POR 044
CE18011_67	08.08.2018	17:30	29	0.12556	598	5 Litres	51°48.82	14°58.37	4	POR 045

ROV Sample Log

Station#	Type	Date	Time	Lat	Long	Depth	Sample Description	Biobox location
CE18011_44	Biobox	06.08.2018	15.51	51.85460667	15.037647	1123	Cnidaria sp1	LC
CE18011_45	Biobox	06.08.2018	15.55	51.854625	15.037622	1122	Leiopathes sp	LC
CE18011_46	Slurp	06.08.2018		51.855815	15.038757	1062	White holothuroidea	SLP1
CE18011_47	Slurp	06.08.2018		51.855815	15.040273	1062	Cerianthid anemone	SLP1
CE18011_48	Biobox	06.08.2018	16.52	51.85721333	15.041237	971	Anthomastus sp	LB
CE18011_49	Biobox	06.08.2018	17.09	51.85805333	15.041272	921	Parantipathes sp	LB
CE18011_50	Biobox	06.08.2018	17.12	51.85805333	15.04127	920	Bathypathes sp	LB
CE18011_51	Slurp	06.08.2018	17.54	51.85657	15.042938	791	Hexadella sp	SLP2
CE18011_52	Biobox	06.08.2018	18.05	51.860215	15.042667	782	Antipathes sp	LD
CE18011_53	Biobox	06.08.2018	18.08	51.860215	15.042667	782	Koehlemetra sp	LD
CE18011_55	Biobox	06.08.2018	20.27	51.86567	15.040125	649	Desmophyllum sp	LA
CE18011_56	Biobox	06.08.2018	20.46	51.86567	15.040125	649	Animal/anemone sp	LA
CE18011_58	Biobox	06.08.2018	21.27	51.86760167	15.037017	596	Cnidaria sp2	LA

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

Master Log

Master Log sheet			Time	DD	DD	Tick appropriate							
Station #	Dive	Date	(UTC)	Lat	Long	Depth (m)	CTD	ROV Video	ROV core	ROV CTD	ROV MBES	EM302	Note
CE18011_1	1	01.08.2018	21:39	51.8796	15.0148								ROV off deck
CE18011_1	1	01.08.2018	21:42	51.8796	15.0147								ROV in water
CE18011_1	1	01.08.2018	21:42	51.8796	15.0147					X			CTD on - Test file: CE18011_T8
CE18011_1	1	01.08.2018		0.0000	0.0000	675							ROV 100 off bottom
CE18011_1	1	01.08.2018	22:14	0.0000	0.0000	675							CTD off
CE18011_2	1	01.08.2018	22:15	51.8802	15.0162	675				X			CTD on - File CE18011_T9
CE18011_2	1	01.08.2018	22:18	51.8803	15.0156	675					200 kHz		Test Line: SOL 0054
CE18011_2	1	01.08.2018	22:23	51.8807	15.0161	675					X		Test Line: EOL 0054
CE18011_2	1	01.08.2018	22:24	51.8807	15.0162	675					200 kHz		Test Line: SOL 0055
CE18011_2	1	01.08.2018	22:24	51.8808	15.0163	675					X		Test Line: EOL 0055
CE18011_3	1	01.08.2018	22:30	51.8805	15.0161	675							ROV Recover
CE18011_3	1	01.08.2018	22:30	51.8805	15.0161	675							CTD off
CE18011_3	1	01.08.2018	22:30	51.8805	15.0161	675				X			CTD on - File CE18011_T10
CE18011_3	1	01.08.2018	22:54	51.8795	15.0142								CTD off
CE18011_3	1	01.08.2018	23:05	51.8813	15.0148								ROV on deck
CE18011_4	2	01.08.2018	23:52	51.8574	15.0037								ROV off deck
CE18011_4	2	01.08.2018	23:55	51.8575	15.0037								ROV in water

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_4	2	02.08.2 018	00: 05	51.857 0	- 15.003 8					X			CTD on - did not work
CE1801 1_4	2	02.08.2 018	00: 17	51.857 9	- 15.003 9					X			CTD on - restarted
CE1801 1_4	2	02.08.2 018	00: 23	51.858 0	- 15.003 9					x			CTD start
CE1801 1_4	2	02.08.2 018	00: 56	51.857 0	- 15.004 7								ROV on bottom
CE1801 1_4	2	02.08.2 018	00: 57	51.857 0	- 15.004 7					x			CTD off - on file
CE1801 1_5	2	02.08.2 018	01: 17	51.857 1	- 15.004 8	932					400 kHz		SOL 0056
CE1801 1_5	2	02.08.2 018	03: 10			703				X			CTD malfuntio n, restarted seasave
CE1801 1_5	2	02.08.2 018	03: 33	51.866 4	- 14.808 8	621				X			CTD restarted
CE1801 1_5	2	02.08.2 018	03: 52	51.867 9	- 14.970 8	620				X			CTD restarted
CE1801 1_5	2	02.08.2 018	04: 23	51.870 5	- 14.963 2	564				X			CTD restarted
CE1801 1_5	2	02.08.2 018	05: 47	51.876 1	- 14.944 6	529					X		EOL 0062
CE1801 1_5	2	02.08.2 018	05: 51	51.876 1	- 14.944 6	529				X			CTD up start
CE1801 1_5	2	02.08.2 018	06: 13	51.871 4	- 14.943 6								ROV up/End CTD
CE1801 1_5	2	02.08.2 018	06: 23	51.875 9	- 14.942 9								ROV on deck
CE1801 1_6	3	02.08.2 018	07: 35	51.781 9	- 15.055 7					X			CTD on. ROV in water.
CE1801 1_6	3	02.08.2 018	07: 42	51.782 5	- 15.055 5	47							ROV going down
CE1801 1_6	3	02.08.2 018	08: 02	51.782 5	- 15.055 5	660							CTD stopped
CE1801 1_6	3	02.08.2 018	08: 24	51.781 7	- 15.054 7	1081							CTD off. ROV on bottom.
CE1801 1_6	3	02.08.2 018	08: 36	51.781 6	- 15.054 8	972				X			CTD on. 100 m off bottom

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_6	3	02.08.2 018	08: 45	51.781 6	- 15.054 4	972					400 kHz		ROV start of line
CE1801 1_6	3	02.08.2 018	08: 50	51.781 5	- 15.053 4	971							ROV stop
CE1801 1_6	3	02.08.2 018	08: 55	51.781 5	- 15.053 4	970					400 kHz		ROV SOL
CE1801 1_6	3	02.08.2 018	09: 11	51.781 6	- 15.047 1	930				X			CTD restarted CTD4b
CE1801 1_6	3	02.08.2 018	09: 45	51.781 6	- 15.040 8	920					X		Line cnt.
CE1801 1_6	3	02.08.2 018	10: 12	51.781 6	- 15.040 8	829				x			CTD stopped
CE1801 1_6	3	02.08.2 018	10: 12	51.781 6	- 15.033 6	829				x			CTD start CTD 4C
CE1801 1_6	3	02.08.2 018	10: 13	51.781 6	- 15.033 6	830							SVP updated- dive3_SV P1
CE1801 1_6	3	02.08.2 018	10: 42	51.781 6	- 15.026 4	767				x			CTD stopped
CE1801 1_6	3	02.08.2 018	10: 42	51.781 6	- 15.026 4	767				X	400 kHz		CTD started CTD4D
CE1801 1_6	3	02.08.2 018	14: 35	51.781 7	- 14.963 8								loss of link to multibea m
CE1801 1_6	3	02.08.2 018	14: 39	51.781 7	- 14.963 9								stop-back to surface
CE1801 1_6	3	02.08.2 018	15: 03	51.782 0	- 14.965 0	0				x			CTD stopped
CE1801 1_7	4	02.08.2 018	16: 51	51.982 1	- 15.063 4					x			CTD 4e up
CE1801 1_7	4	02.08.2 018	16: 55	51.982 1	- 15.063 4								ROV on deck
CE1801 1_7	4	02.08.2 018	17: 01	51.982 3	- 15.063 4								ROV in water
CE1801 1_7	4	02.08.2 018	17: 05	51.982 4	- 15.063 3								ROV on deck - retrival due to problem
CE1801 1_7	4	02.08.2 018	17: 06	51.982 1	- 15.064 7								ROV in water
CE1801 1_7	4	02.08.2 018	17: 10	51.982 9	- 15.063 3					X			CTD on

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_7	4	02.08.2 018	17: 19	51.983 1	- 15.050 7	269				x			CTD5a
CE1801 1_7	4	02.08.2 018	17: 25	51.983 1	- 15.064 1	500							Pinging
CE1801 1_7	4	02.08.2 018	17: 43	51.985 8	- 15.063 6	1025				X			CTD5b
CE1801 1_7	4	02.08.2 018	18: 06	51.990 0	- 15.063 8	1653				x			CTD5cdo wn
CE1801 1_7	4	02.08.2 018	18: 10	51.991 7	- 15.063 8	1653							ROV on bottom. CTD off
CE1801 1_7	4	02.08.2 018	18: 15	51.983 0	- 15.063 8	1517							ROV CTD5 During
CE1801 1_7	4	02.08.2 018	18: 16	51.983 0	- 15.063 7	1531				x			CTD 5a during
CE1801 1_7	4	02.08.2 018	18: 45	51.981 2	- 15.059 7						X		line 3 started
CE1801 1_7	4	02.08.2 018	18: 45	51.981 2	- 15.059 6	1557				x			CTD stopped
CE1801 1_7	4	02.08.2 018	18: 48	51.981 1	- 15.059 3	1545				x			CTD start - CTD 5b during
CE1801 1_7	4	02.08.2 018	19: 05	51.980 0	- 15.056 9	1371					X		ROV up 100m from seafloor
CE1801 1_7	4	02.08.2 018	19: 21	51.970 0	- 15.054 6	1080				x			CTD stopped restarted 5c
CE1801 1_7	4	02.08.2 018	19: 53	51.976 9	- 15.050 0	951				x			CTD stopped restarted 5d
CE1801 1_7	4	02.08.2 018	19: 59	51.976 4	- 15.048 7	919				x			CTD stopped restarted 5e
CE1801 1_7	4	02.08.2 018	20: 26	51.974 6	- 15.045 6	762				x			CTD stopped restarted 5f
CE1801 1_7	4	02.08.2 019	20: 57	51.583 7	- 15.024 2	591				x			CTD stopped restarted 5g
CE1801 1_7	4	02.08.2 020	21: 05	51.972 2	- 15.038 8	603							co ordinates converted from DDM to DD

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_8	4	02.08.2 021	21: 07	51.972 6	15.042 2	580							
CE1801 1_8	4	02.08.2 022	21: 27	51.970 3	15.037 8						X		EOL 0071
CE1801 1_8	4	02.08.2 023	21: 40	51.970 3	15.037 8								
CE1801 1_9	4	02.08.2 024	22: 18	52.002 5	15.044 8					x			CTD Line up
CE1801 1_9	4	02.08.2 025	22: 18	52.002 5	15.044 8								ROV on surface. CTD off
CE1801 1_9	5	02.08.2 026	23: 19	52.002 3	15.044 7	1802							ROV on deck
CE1801 1_10	5	02.08.2 027	23: 19	52.002 1	15.044 4	1694							ROV in water
CE1801 1_10	5	02.08.2 028	23: 31	52.002 1	15.044 4	1694				x			CTD on - CTD 6_down
CE1801 1_10	5		00: 05	51.997 5	15.040 3	1513				x			CTD off - CTD 6_down
CE1801 1_11	5		00: 05	51.664 3	15.040 4	1514					X		SOL 0072
CE1801 1_11	5		00: 29	51.993 7	15.039 8	1342				x			CTD on - CTD 6_during
CE1801 1_12	5		00: 36	51.993 9	15.039 8	1352					X		EOL 0072 - Turn
CE1801 1_12	5		00: 39	51.993 6	15.039 8	1322					X		SOL 0073
CE1801 1_12	5		00: 59	51.991 5	15.039 8	1180					X		EOL 0073 - Issue with ROV navigatio n
CE1801 1_12	5		01: 42	51.987 2	15.039 5	887					X		SOL 0074
CE1801 1_12	5		01: 43	51.987 1	15.038 7	707				x			CTD restarted - CTD 6b_during
CE1801 1_12	5		03: 33	51.984 3	15.046 6	594				x			CTD restarted - CTD 6c_during
CE1801 1_12	5		04: 32	51.982 6	15.015 8	573							ROV EOL 0077
CE1801 1_12	5		05: 14	51.096 7	15.001 8	574							ROV SOL 0078

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_13	5		05: 15	51.967 4	15.995 3	574				x			CTD restarted - CTD 6d_during
CE1801 1_13	5		05: 50	51.984 2	15.997 5					X			CTD restarted - CTD 6e_during
CE1801 1_13	5		05: 52	51.984 2	14.997 5					x	X		EOL CTD 6e - stopped - line 0082 - CTD 7_ upcast
CE1801 1_14			05: 56	5159.1 800	1500.1 200	739				x			CTD 7_ stopped
CE1801 1_14			06: 11	5200.2 200	1502.0 300	1740							ROV on deck
CE1801 1_15	NA										X		SOL 0004
CE1801 1_15	NA										X		EOL 0004
CE1801 1_15	6		06: 36										ROV in water
										x			CTD on (CTD 7) CTD8
CE1801 1_15	6	03/08/2 018	06: 46							X			CTD off , CTD 8 down
CE1801 1_15	6	03/08/2 018	07: 18	52.003 4	15.032 0	1170				x			CTD 8 off
CE1801 1_15	6	03/08/2 018	07: 20	52.003 4	15.032 0	1171				x			CTDa down
CE1801 1_15	6	03/08/2 018	07: 40	52.553 9	15.032 0	1718				x			CTD off - at bottom
CE1801 1_15	6	03/08/2 018	07: 44	52.000 4	15.032 0					x			CTD, on, during
CE1801 1_15	6	03/08/2 018	07: 44	52.003 3	15.032 0	1615				X			CTD8, on, during
CE1801 1_15	6	03/08/2 018	10: 28	51.986 7	15.017 5	608					X		EOL
CE1801 1_15	6	03/08/2 018	10: 30	52.586 7	15.017 3	608				X			CTD8, up
CE1801 1_15	6	03/08/2 018	10: 54	52.586 9	15.016 5					X			CTD stopped
CE1801 1_15	6	03/08/2 018	10: 55	52.586 9	15.016 5								ROV on surface
CE1801 1_15	6	03/08/2 018	11: 10	51.987 2	15.014 3								ROV on deck

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_16	7	03/08/2 018	11: 52	52.042 0	- 14.094 7								ROV on deck
CE1801 1_16	7	03/08/2 018	11: 57	52.042 2	- 14.946 5								ROV in water
CE1801 1_16	7	03/08/2 018	11: 59	52.042 1	- 14.946 2					x			CTD on, CTD9 down
CE1801 1_16	7	03/08/2 018	12: 45	52.042 0	- 14.947 8	1265				X			CTD off
CE1801 1_16	7	03/08/2 018	12: 48	52.042 0	- 14.947 9	1265				X			CTD on, CTD9 during
CE1801 1_16	7	03/08/2 018	12: 55	52.041 9	- 14.947 7	1164					X		SOL 6 - logging
CE1801 1_16	7	03/08/2 018	15: 08	52.030 6	- 14.092 9	589					X		EOL 6 - stopped
CE1801 1_16	7	03/08/2 018	15: 09	52.030 6	- 14.092 9	589				X			CTD off
CE1801 1_16	7	03/08/2 018	15: 09	52.030 6	- 14.929 5	589				X			CTD on,CTD9 up
CE1801 1_16	7	03/08/2 018	15: 29	52.028 8	- 14.927 0	3				x			CTD off
CE1801 1_16	7	03/08/2 018	15: 30	52.028 8	- 14.927 0								ROV on surface
CE1801 1_16	7	03/08/2 018	15: 41	52.028 5	- 14.926 8								ROV on deck
CE1801 1_17	8	03/08/2 018	16: 29	52.115 2	- 14.903 2								ROV on deck
CE1801 1_17	8	03/08/2 018	16: 30	52.115 2	- 14.090 3								ROV in water
CE1801 1_17	8	03/08/2 018	16: 32	52.011 5	- 14.903 2					x			CTD on (10down)
CE1801 1_17	8	03/08/2 018	17: 14	52.011 6	- 14.903 7	1236				x			CTD off
CE1801 1_17	8	03/08/2 018	17: 15	52.116 2	- 14.903 7	1236				x			CTD on (10) during
CE1801 1_17	8	03/08/2 018	17: 22	52.116 2	- 14.753 6	1135					X		SOL 86
CE1801 1_17	8	03/08/2 018	18: 10	52.113 0	- 14.896 4	925							sensor error
CE1801 1_17	8	03/08/2 018	18: 20	52.112 3	- 14.895 0	884				x			CTD off

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_17	8	03/08/2 018	18: 20	52.112 3	14.895 0	884				x			CTD on - CTD 10b
CE1801 1_17	8	03/08/2 018	17: 40	52.106 6	14.891 7	635				x			CTD restarted - CTD 10c
CE1801 1_18	8	03/08/2 018	20: 25	52.103 3	14.877 1	539					X		EOL 0089. CTD off
CE1801 1_18	8	03/08/2 018	20: 25	52.103 3	14.877 1	539				x			CTD on - CTD 10up
CE1801 1_18	8	03/08/2 018	20: 42	52.103 6	14.876 9					x			CTD off
CE1801 1_18	8	03/08/2 018	20: 47	52.103 6	14.878 3								ROV out of water
CE1801 1_18	8	03/08/2 018	20: 57	52.136 5	14.877 3								ROV on deck
CE1801 1_19	9	03/08/2 018	21: 44	52.200 4	14.874 4								ROV off deck
CE1801 1_19	9	03/08/2 018	21: 46	52.200 4	14.874 4								ROV in water
CE1801 1_19	9	03/08/2 018	21: 48	52.200 3	14.874 3					x			CTD on - CTD 11down
CE1801 1_19	9	03/08/2 018	22: 25	52.200 3	14.875 4					x			CTD off
CE1801 1_20	9	03/08/2 018	22: 40	52.200 3	14.875 4					x			CTD on - CTD 11during
CE1801 1_20	9	03/08/2 018	22: 40	52.200 3	14.875 4						X		SOL 0090 - issues with pitch at SOL
CE1801 1_20	9	04/08/2 018	01: 13	52.203 0	14.852 3					x			CTD restarted - CTD 11duringb
CE1801 1_20	9	04/08/2 018	01: 42	52.216 2	14.846 3					x			CTD restarted - CTD 11duringc

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

													Issue with ROV navigation - sudden jump in positioning 20 m starboard, then 20 m port. Line cut several times at these coordinates to fix this issue. ROV team believe issue relates to ships° MRU.
CE18011_20	9	04/08/2018	03:09	52.2120	14.8308	623							
CE18011_20	9	04/08/2018	04:46	52.2162	14.8154	467				x			CTD restarted - CTD 11duringd
CE18011_20	9	04/08/2018	04:52	52.2162	14.8146	481				x			CTD restarted - CTD 11duringe
CE18011_20	9	04/08/2018	04:59	52.2165	14.8136	490					X		EOL - Line 0103
CE18011_21	9	04/08/2018	05:01	52.2166	14.8130	504				x			CTD on - CTD 11up
CE18011_21	9	04/08/2018	05:17	52.2164	14.8130					x			CTD off
CE18011_21	9	04/08/2018	05:27	52.2156	14.8130								ROV on deck
CE18011_22		04/08/2018	05:38	52.2077	14.8203	602						x	SOL0006
CE18011_22		04/08/2018	07:09	51.9887	15.0092	724						x	EOL0007
CE18011_23	10	04/08/2018	07:24	0.0000	0.0000								ROV on deck
CE18011_23	10	04/08/2018	07:28	51.9898	15.0081								ROV in water
CE18011_23	10	04/08/2018	07:31	51.9903	15.0085					x			CTD on CTD14 down
CE18011_24	10	04/08/2018	08:00	51.9904	15.0084	720				x			CTD on Bottom (14)

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_24	10	04/08/2 018	08: 12	51.990 2	- 15.008 8	620				x			CTD on during
CE1801 1_24	10	04/08/2 018	08: 29	51.988 8	- 15.011 2	611							slowed to 4 knots
CE1801 1_24	10	04/08/2 018	09: 44	51.983 2	- 15.020 7	617				x			CTD off
CE1801 1_24	10	04/08/2 018	09: 45	51.983 2	- 15.020 8	613				x			CTD on, CTD 15a
CE1801 1_24	10	04/08/2 018	10: 29	51.979 8	- 15.026 7	601					x		Autolead stopped, vessel stopped, moved back 50m to cover area
CE1801 1_24	10	04/08/2 018	10: 38	51.979 9	- 15.026 3	601					x		restarted at this point
CE1801 1_24	10	04/08/2 018	11: 07	51.977 2	- 15.029 4	633					x		stop logging - error PU, moving back 10 mins?
CE1801 1_24	10	04/08/2 018	11: 08	51.978 1	- 15.029 4	635					x		line 107 - logging
CE1801 1_24	10	04/08/2 018	12: 44	51.971 0	- 15.041 2	656.7					x		EOL 107
CE1801 1_24	10	04/08/2 018	13: 25	51.973 8	- 15.042 8	621.9					x		SOL 108
CE1801 1_24	10	04/08/2 018	13: 38	51.976 3	- 15.038 6	626.6							ROV up by 10m
CE1801 1_24	10	04/08/2 018	14: 03	51.977 0	- 15.037 2	643.1				x			CTD off
CE1801 1_24	10	04/08/2 018	14: 05	51.977 1	- 15.037 2	643				x			CTD on 15b
CE1801 1_24	10	04/08/2 018	14: 49	51.979 9	- 15.032 5	512				x			CTD off - CTD on 15c
CE1801 1_24	10	04/08/2 018	15: 00	51.981 0	- 15.030 4	553							vessel stopped - moved back 250m to fill hole in data
CE1801 1_24	10	04/08/2 018	15: 12	9860.5 500	- 15.030 6	541					x		stopped logging EOL 108

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_24	10	04/08/2 018	15: 29	51.979 9	- 15.032 5	515					x		start logging - SOL 109
CE1801 1_24	10	04/08/2 018	15: 30	51.979 8	- 15.032 6						x		up 150m @0.1 knot to recover data.
CE1801 1_24	10	04/08/2 018	15: 34	51.979 6	- 15.032 8	529					x		Vessel moving forward @0.4 knots
CE1801 1_24	10	04/08/2 018	15: 45	51.980 4	- 15.031 5						x		vessel stopped
CE1801 1_24	10	04/08/2 018	15: 50	51.980 5	- 15.031 4						x		stopped logging
CE1801 1_24	10	04/08/2 018	15: 55	51.980 2	- 15.031 7	509							start logging - vessel re- orientate d SW to recover hole in data
CE1801 1_24	10	04/08/2 018	16: 26	51.980 5	- 15.031 4						x		recoverin g hole in data
CE1801 1_24	10	04/08/2 018	17: 07	51.993 2	- 15.025 8	567							CTD off
CE1801 1_24	10	04/08/2 018	17: 07	51.993 2	- 15.025 8	567							CTD 15d duribg
CE1801 1_24	10	04/08/2 018	18: 50	51.992 1	- 15.011 6	666							EOL 113 - New line 114 - vessel turning - CNT
CE1801 1_24	10	04/08/2 018	19: 20	51.993 1	- 15.013 3	811							SOL 0116
CE1801 1_24	10	04/08/2 018	21: 36	51.999 6	- 15.030 6								CTD restarted - CTD 15e during
CE1801 1_24	10	04/08/2 018	23: 33	51.977 0	- 15.043 6	750							EOL 0118
CE1801 1_24	10	04/08/2 018	23: 35	51.980 9	- 15.046 4	758							CTD restarted - CTD 15f during
CE1801 1_24	10	04/08/2 018	23: 48	51.976 6	- 15.046 0	820							SOL 0120 (turn in line 0119)
CE1801 1_24	10	04/08/2 018	23: 55	51.976 8	- 15.045 6	852				s			CTD restarted

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

													- CTD 15g during
CE1801 1_25	10	05/08/2 018	01: 06	51.981 4	15.037 9	724							CTD off
CE1801 1_25	10	05/08/2 018	01: 06	51.981 4	15.037 9	724							CTD on - CTD 15 up
CE1801 1_26	NA	05/08/2 018	01: 59	51.988 7	15.037 0	1491						X	
CE1801 1_26	NA	05/08/2 018	05: 19	52.258 3	14.932 8	969							SoL 0009
CE1801 1_26	NA	05/08/2 018	05: 49	52.189 5	14.984 3	1161						X	Line break (0009)due to ROVlift for VC outfitting
CE1801 1_26	NA	05/08/2 018	06: 50	52.182 2	14.990 0	1267						X	Line restarted- 0010
CE1801 1_26		05/08/2 018	08: 58	51.907 7	15.193 3	2282						X	Line cut
CE1801 1_26	NA	05/08/2 018	10: 08	51.770 8	15.296 0	2553						X	Line cut- New line 0013
				51.770 8	15.296 0	2553						X	Start extended line. Captain following header as SIS lines not activating
CE1801 1_26	NA	05/08/2 018	10: 20	51.747 7	15.315 7	2492						X	Possible gap in line. 0013 gap appeared behind vessel
CE1801 1_26	NA	05/08/2 018	10: 56	51.683 2	15.372 0	2796						X	EoL Vessel stopped and rebooting system
CE1801 1_26	NA	05/08/2 018	11: 13	51.671 5	15.373 7	2848						X	System rebooted
CE1801 1_26	NA	05/08/2 018	11: 47	51.652 0	15.294 7	2744						X	SoL-0014 Logging
CE1801 1_26	NA	05/08/2 018	13: 50	51.901 8	15.089 0	880						X	EoL 0016- stop logging
CE1801 1_27	11	05/08/2 018	14: 50	51.983 2	14.999 2					x			CTD on - ?? down

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_27	11	05/08/2 018	15: 19	51.983 0	- 14.999 6	641.1				x			CTD off 16 down
CE1801 1_27	11	05/08/2 018	15: 20	51.983 0	- 14.999 6	641.1				x			CTD on 16b down
CE1801 1_27	11	05/08/2 018	15: 24	51.982 9	- 14.995 2	660							ROV on bottom
CE1801 1_27	11	05/08/2 018	15: 24	51.982 9	- 14.995 2	660				x			CTD off
CE1801 1_27	11	05/08/2 018	15: 25	51.982 9	- 14.995 3	660				x			CTD on - 16 during
CE1801 1_28	11	05/08/2 018	15: 28	51.982 9	- 14.999 5	660.1			x				VC1 taken
CE1801 1_27	11	05/08/2 018	16: 00	51.982 2	- 15.003 4	659				x			CTD off
CE1801 1_27	11	05/08/2 018	16: 01	51.982 2	- 15.003 4	659				x			CTD 16c on
CE1801 1_29	11	05/08/2 018	16: 29	51.982 2	- 15.007 5	730.8			x				VC2taken
CE1801 1_30	11	05/08/2 018	17: 27	51.983 5	- 15.013 6	722.8				x			ROV Landed
CE1801 1_30	11	05/08/2 018	17: 30	51.983 5	- 15.013 6	722			x	x			Core VC3taken
CE1801 1_30	11	05/08/2 018	18: 23	51.984 3	- 15.018 9								CTD restarted
CE1801 1_31	11	05/08/2 018	19: 02	51.984 7	- 15.109 0	671							VC4 taken
CE1801 1_32	11	05/08/2 018	19: 25	51.984 1	- 15.024 8	699			X				VC5 taken
CE1801 1_33	11	05/08/2 018	19: 37	51.984 2	- 15.024 5	692			X				CTD off. CTD on - CTD16up
CE1801 1_33	11	05/08/2 018	20: 03	51.999 5	- 15.022 1					X			CTD off - ROV at surface
CE1801 1_34	12	05/08/2 018	20: 20	51.999 5	- 15.022 1								ROV on deck
CE1801 1_34	12	05/08/2 018		0.0000	0.0000								CTD on (missed half way down) - CTD 17down
CE1801 1_35	12	05/08/2 018	22: 18	52.014 1	- 15.037 0	1858							CTD off. CTD on - CTD16dur ing

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_35	12	05/08/2 018	22: 23	52.014 1	15.037 0	1858			X				VC6 taken
CE1801 1_36	12	06/08/2 018	00: 01	52.003 2	15.032 0	1717			x				Moved to a new locality. Cup for VC was prefilled with surroundin g sediment
CE1801 1_36	12	06/08/2 018	00: 15	52.003 3	15.032 1	1717			X				VC7 taken
CE1801 1_37	12	06/08/2 018	02: 55	51.995 7	15.026 2	1201			X				VC8 taken
CE1801 1_38	12	06/08/2 018	03: 37	51.990 3	15.022 2	902							VC9 taken. Dive abandone d due to maintena nce issue with ROV
CE1801 1_39	12	06/08/2 018	03: 44	51.990 3	15.022 2	901							CTD stopped. CTD on - CTD 17up
CE1801 1_39	12	06/08/2 018	04: 26	51.990 5	15.021 0								CTD off
CE1801 1_39	12	06/08/2 018	04: 28	51.990 5	15.021 0								ROV on deck
CE1801 1_40	NA	06/08/2 018	04: 56	52.175 6	15.589 8	696						x	SOL 0017
CE1801 1_40	NA	06/08/2 018	06: 39	52.208 2	14.777 0	491						x	EOL0017
CE1801 1_40	NA	06/08/2 018	06: 48	52.198 7	14.764 7	491						x	False start 0018
CE1801 1_40	NA	06/08/2 018	06: 48	52.198 7	14.764 7	491						x	SOL 0019
CE1801 1_40	NA	06/08/2 018	07: 22	52.126 7	14.812 5	586						x	EOL 0019
CE1801 1_40	NA	06/08/2 018	07: 24	52.121 7	14.815 3	559						x	stopped logging
CE1801 1_40	NA	06/08/2 018	07: 45	52.142 7	14.770 3	549						x	SOL 0020

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_40	NA	06/08/2 018	07: 57	52.155 8	- 14.786 3	634						x	EOL 0020 Problem in bridge - needed to reboot system sis
CE1801 1_40	NA	06/08/2 018	08: 07	52.156 8	- 14.787 5	712						x	started logging 0021
CE1801 1_40	NA	06/08/2 018	09: 21	52.280 7	- 14.946 2	976						x	cut line 0021
CE1801 1_40	NA	06/08/2 018		0.0000	0.0000							x	cut line 0022- corner
CE1801 1_40	NA	06/08/2 018		0.0000	0.0000							x	system crash
CE1801 1_40	NA	06/08/2 018		0.0000	0.0000							x	0023- crashed/t urn
CE1801 1_40	NA	06/08/2 018	09: 51	52.276 2	- 14.995 7							x	stop logging
CE1801 1_40	NA	06/08/2 018	09: 52	52.279 2	- 14.993 2							x	stop logging
CE1801 1_40	NA	06/08/2 018	10: 01	52.276 8	- 14.976 8							x	start logging 0023
CE1801 1_40	NA	06/08/2 018	12: 40	51.943 7	- 15.262 8	2363						x	stop logging 0024
CE1801 1_40	NA	06/08/2 018	13: 05	51.913 0	- 15.231 7	2105						x	start logging 0025
CE1801 1_41	13	06/08/2 018	14: 21	51.853 0	- 15.036 2		x			x			ROV on deck
CE1801 1_41	13	06/08/2 018	14: 21	51.853 1	- 15.036 3					x			ROV in water
CE1801 1_41	13	06/08/2 018	14: 32	51.853 3	- 15.037 4					x			CTD on 18 down
CE1801 1_41	13	06/08/2 018	14: 36	51.853 6	- 15.035 9		x			x			ROV diving
CE1801 1_41	13	06/08/2 018	15: 11	51.853 7	- 15.036 5	1100	x			x			CTD down 18b
CE1801 1_41	13	06/08/2 018	15: 12	51.853 6	- 15.036 6	1155				x			CTD off, hit seabed
CE1801 1_42	13	06/08/2 018	15: 18	51.853 5	- 15.036 7	1155				x			CTD on - 18 during
CE1801 1_43	13	06/08/2 018	15: 34	51.853 7	- 15.036 7	1158	x			x			HD start - Dive 13 Part A

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_43	13	06/08/2 018	15: 44	51.854 4	- 15.037 6	1128				x			laser scale on
CE1801 1_44	13	06/08/2 018	15: 54	51.854 6	- 15.037 6	1123	x			x			Blob sample - cnidaria
CE1801 1_45	13	06/08/2 018	15: 55	51.854 6	- 15.037 6	1122				x			Blob sample- leiopathes sp.
CE1801 1_46	13	06/08/2 018	16: 18	51.855 8	- 15.038 8	1064				x			Slurp sample - sea cucumber
CE1801 1_47	13	06/08/2 018	16: 55	51.857 2	- 15.040 3	1064				x			Slurp sample- soft coral
CE1801 1_48	13	06/08/2 018		0.0000	0.0000	971				x			see johns log
CE1801 1_49	13	06/08/2 018		0.0000	0.0000	921				x			see johns log
CE1801 1_50	13	06/08/2 018	17: 12	51.858 1	- 15.041 3	920	x			x			bathypath es
CE1801 1_50	13	06/08/2 018	17: 34	51.859 1	- 15.037 6	852				x			Stop HD - Dive 13 part A
CE1801 1_50	13	06/08/2 018	17: 35	51.859 1	- 15.038 7	851	x			x			Start HD - Dive 13 part B
CE1801 1_51	13	06/08/2 018	17: 54	51.859 9	- 15.042 9	791							Slurp sample - Hexedella sp
CE1801 1_52	13	06/08/2 018	18: 05	51.860 2	- 15.042 7	782							Blob sample - Antipathe s sp
CE1801 1_53	13	06/08/2 018	18: 08	51.860 2	- 15.042 7	782							Blob sample - Roehleme tha sp
CE1801 1_54	13	06/08/2 018	19: 53	51.863 6	- 15.040 6	734	x						Niskin fired LHS
CE1801 1_55	13	06/08/2 018	20: 29	51.865 7	- 15.040 1	649							Blob sample - Desmoph yllum sp.
CE1801 1_55	13	06/08/2 018	20: 32	51.865 7	- 15.040 1	649							Niskin fired middle
CE1801 1_56	13	06/08/2 018	20: 46	51.865 7	- 15.040 1	649							Blob sample - anemone
CE1801 1_57	13	06/08/2 018	21: 11	51.866 8	- 15.038 2	614							Niskin fired RHS
CE1801 1_58	13	06/08/2 018	21: 27	51.867 6	- 15.037 0	596							Blob sample -

CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

													cnidaria sp 2
CE1801 1_59	13	06/08/2 018	22: 36	51.870 5	15.032 8	585							CTD off. CTD on - CTD13 up
CE1801 1_59	13	06/08/2 018	23: 00	51.870 1	15.032 8								CTD off.
CE1801 1_60	NA	07/08/2 018	00: 20	51.922 0	15.015 8	766						X	SOL 0026
CE1801 1_60	NA	07/08/2 018	00: 46	51.976 7	14.990 2	641						X	EOL 0026
CE1801 1_60	NA	07/08/2 018	01: 30	51.892 7	15.045 8	798						X	SOL 0027
CE1801 1_60	NA	07/08/2 018	03: 40	51.956 8	15.214 3	1990						X	EOL 0027
CE1801 1_60	NA	07/08/2 018	03: 56	51.638 5	15.177 8	1521						X	SOL 0028
CE1801 1_60	NA	07/08/2 018	06: 22	53.003 5	14.939 0	614						X	EOL 0030
CE1801 1_60	NA	07/08/2 018	07: 22	51.039 3	14.888 3	532						X	SOL 0031
CE1801 1_60	NA	07/08/2 018	08: 02	52.133 0	14.820 0	622						X	EOL 0031
CE1801 1_60	NA	07/08/2 018	08: 07	52.134 8	14.822 2	620						X	SOL 0032
CE1801 1_60	NA	07/08/2 018	12: 23	51.645 2	15.131 5	1331						X	EOL 0034
CE1801 1_60	NA	07/08/2 018		0.0000	0.0000							X	line 0035 corner
CE1801 1_60	NA	07/08/2 018	12: 36	51.646 3	15.100 5	1236						X	SOL 0036
CE1801 1_60	NA	07/08/2 018	14: 33	51.875 0	14.955 3	660						X	EOL 0036
CE1801 1_60	NA	07/08/2 018	14: 48	51.861 3	14.930 5	616						X	Line 0037 corner
CE1801 1_60	NA	07/08/2 018	14: 48	51.861 3	14.930 5	616						X	sol 0038
CE1801 1_60	NA	07/08/2 018	15: 50	51.742 2	15.017 3	884						X	eol 0038
CE1801 1_60	NA	07/08/2 018	15: 53	51.737 7	15.024 2	896						X	stop logging

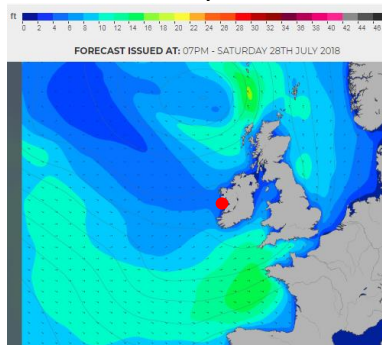
CE18011 Cruise Report: Controls of Cold-Water Coral Habitats in Submarine Canyons (CoCoHaCa II)

CE1801 1_60	NA	07/08/2 018	17: 51	51.661 2	- 15.328 0	2891						X	system crashed
CE1801 1_60	NA	07/08/2 018	18: 15	51.649 2	- 15.339 8	2892						X	SOL 0040
CE1801 1_60	NA	07/08/2 018	22: 00	52.085 5	- 15.021 8	1700						X	EOL 0041
CE1801 1_60	NA	07/08/2 018	22: 30	52.100 0	- 15.091 0	1483						X	SOL 0042
CE1801 1_60	NA	08/08/2 018	01: 03	51.803 3	- 15.329 5	2753						X	EOL 0043
CE1801 1_61	NA	08/08/2 018	05: 08	52.221 5	- 14.876 3	915.5	X						CTD cast 1
CE1801 1_62	NA	08/08/2 018	07: 52	52.094 3	- 14.860 2	918	X						CTD cast 2
CE1801 1_63	NA	08/08/2 018	09: 16	52.063 3	- 15.008 0	1715	X						CTD cast 3
CE1801 1_64	NA	08/08/2 018	11: 32	51.959 5	- 15.033 2	523	X						CTD cast 4
CE1801 1_65	NA	08/08/2 018	12: 52	51.944 5	- 15.149 0	1853	X						CTD cast 5
CE1801 1_66	NA	08/08/2 018	15: 37	51.020 2	- 15.020 2	1200	X						CTD cast 6
CE1801 1_67	NA	08/08/2 018	17: 36	51.813 7	- 14.972 8	618	X						CTD cast 7
CE1801 1_68	NA	08/08/2 018	22: 41	51.670 8	- 13.773 0	513						X	SOL 0044
CE1801 1_68	NA	09/08/2 018	08: 34	51.753 2	- 11.696 8	-							Stopped logging
CE1801 1_68	NA	09/08/2 018	08: 34	51.763 7	- 11.407 8	-						X	Started logging again
CE1801 1_68	NA	09/08/2 018	08: 48	51.753 2	- 11.696 8	-						X	EOL 054
CE1801 1_68	NA	09/08/2 018	09: 23	51.800 0	- 11.640 8	-						X	SO: 055

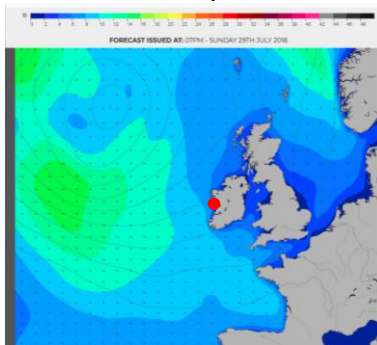
Weather Report

Charts (Swell)

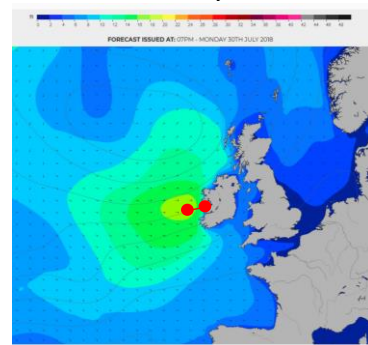
12.00: 29th July



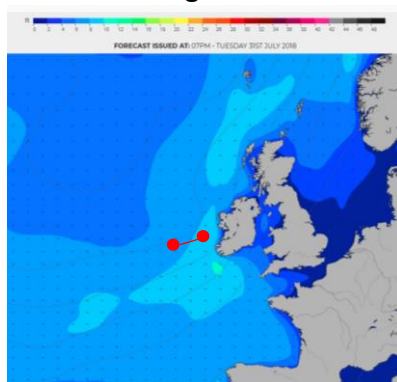
12.00: 30th July



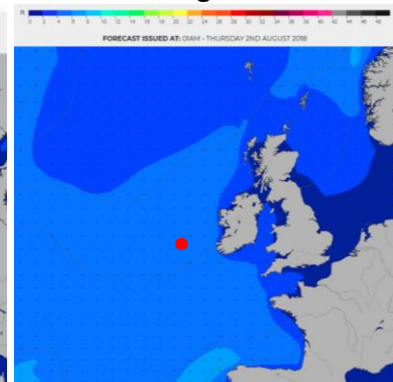
12.00: 31st July 2018



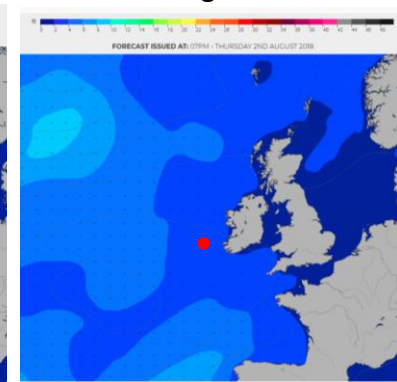
12.00: 1st Aug 2018



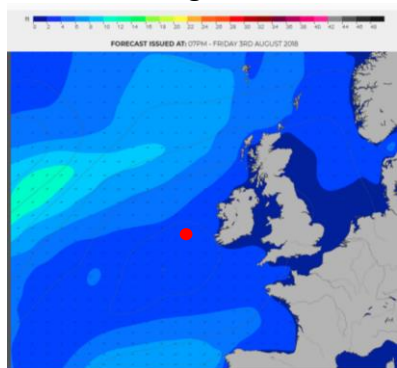
12.00: 2nd Aug 2018



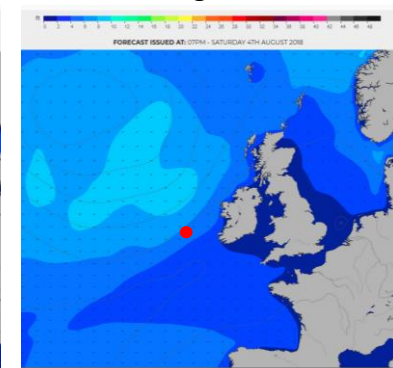
12.00: 3rd Aug 2018



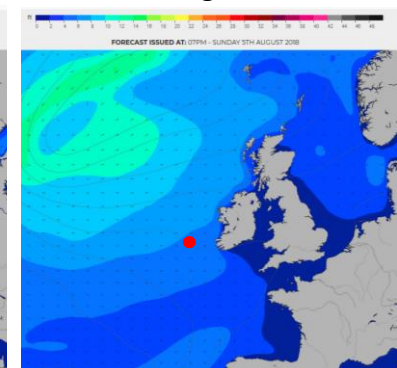
12.00: 4th Aug 2018



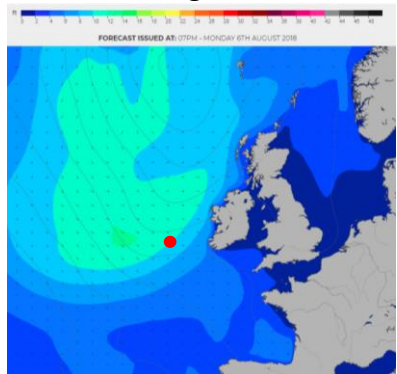
12.00: 5th Aug 2018



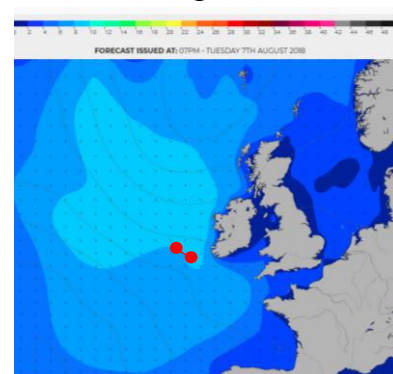
12.00: 6th Aug 2018



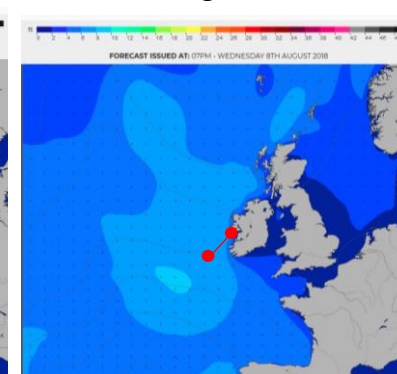
12.00: 7th Aug 2018



12.00: 8th Aug 2018



12.00: 9th Aug 2018



Weather report

29th July - Galway Bay

06.42: Wind northerly 7 kts, Force 3
12.00: Wind westerly, Force 3
14.00: Wind WSW, Force 3, calm seas, good visibility
16.00: Wind WSW, Force 3, calm seas, good visibility
23.09: Wind SW, Force 6
23.56: Wind SW 10 kts, Force 6

30th July - Galway Bay

02.00: Wind SW 10.5 kts, Force 6, slight sea
04.00: Wind SW, Force 5, calm seas, good visibility
08.00: Wind SW, Force 5-6, sheltered waters, good visibility
11.58: Wind SW, Force 4
14.00: Wind SW, Force 4, sheltered waters, partly cloudy
16.00: Wind SW, Force 4, sheltered waters, partly cloudy
20.00: Wind SW, Force 4.5, sheltered waters
22.53: Wind SW, Force 5
23.56: Wind SW, Force 5

31st July - Galway Bay to transit

02.00: Wind SW, Force 5-6, sheltered waters
04.00: Wind SW, Force 6, rain, good visibility
08.00: Wind SW, Force 7, sheltered waters, heavy rain, poor visibility
12.04: Wind SW, Force 7
14.05: Wind SW, Force 7, moderate sea & swell, cloudy, good visibility
16.00: Wind SW, Force 7, moderate sea & swell
20.10: Wind SW, Force 6-7, rough sea, rain, poor visibility
21.52: Wind SW, Force 6
23.51: Wind SW, Force 6

1st August - Transit & Porcupine Bank Canyon

02.00: Wind SW, Force 5, moderate sea & swell
04.00: Wind SW, Force 5, moderate sea & swell
07.55: Wind SSE, Force 5-6, moderate sea & swell
10.57: Wind SSW, Force 5
12.01: Wind SSW, Force 5
14.00: Wind SSW, Force 4, slight sea & swell, good visibility
16.00: Wind SSW, Force 4, slight sea & swell, fog, poor visibility
20.00: Wind SW, Force 4-5, slight sea, moderate visibility
23.55: Wind SW, Force 4

2nd August- Porcupine Bank Canyon

02.00: Wind S, Force 3, calm seas, good visibility

04.00: Wind S, Force 3, calm seas, good visibility
08.00: Wind S, Force 2-3, slight sea, poor visibility
12.10: Wind SW, Force 3, calm seas
14.00: Wind SW, Force 3, calm seas, fog, poor visibility
16.15: Wind SW, Force 3, calm seas, fog, poor visibility
20.00: Wind W, Force 2-3, calm seas, good visibility
22.44: Wind SSW, Force 3
23.58: Wind SSW, Force 3

3rd August - Porcupine Bank Canyon

02.00: Wind W, Force 3, calm seas
04.00: Wind W, Force 3, calm seas
08.00: Wind SW, Force 2-3, slight seas, good visibility
14.00: Wind light variable, Force 3, calm seas and swell, good visibility
16.00: Wind NW, Force 2, calm seas, good visibility
20.05: Wind WSW, Force 2-3, slight sea, good visibility
21.29: Wind NNW, Force 3
22.00: Wind NW, Force 4
23.55: Wind NW, Force 3

4th August - Porcupine Bank Canyon

02.00: Wind W, Force 3, calm seas, good visibility
04.00: Wind W, Force 3, calm seas, good visibility
07.55: Wind light variable, calm seas, good visibility
12.00: Wind SW, Force 3
14.00: Wind SW, Force 2, calm seas, cloudy, good visibility
16.00: Wind SW, Force 2, calm seas, cloudy, good visibility
20.00: Wind SW, Force 2, calm seas, good visibility
23.58: Wind SW, Force 4

5th August - Porcupine Bank Canyon

02.00: Wind SSW, Force 3, calm seas, good visibility
04.00: Wind SW, Force 3, calm seas, good visibility
08.00: Wind SW, Force 5, slight sea, good visibility
10.45: Wind SW, Force 5
12.00: Wind SW, Force 5
14.00: Wind SSW, Force 4, slight/moderate swell, good visibility
20.00: Wind SW, Force 4-5, moderate sea, poor visibility
21.25: Wind SW, Force 5, fog
23.55: Wind SW, Force 5

6th August - Porcupine Bank Canyon

02.00: Wind W, Force 3, calm seas, good visibility
04.00: Wind W, Force 3, calm seas, good visibility
08.00: Wind W, Force 5-6, slight/moderate sea, rain, poor visibility
10.54: Wind W, Force 5, calm seas

12.05: Wind SW, Force 4
14.00: Wind W, Force 5, calm seas, cloudy, good visibility
16.00: Wind W, Force 4, calm seas, slight swell
20.00: Wind W, Force 4, slight sea, good visibility
22.41: Wind SW, Force 5
23.37: Wind W, Force 5-6, 21-25 kts

7th August - Porcupine Bank Canyon

02.00: Wind W, Force 5, slight/moderate sea, good visibility
04.00: Wind W, Force 5, moderate sea, good visibility
08.00: Wind W, Force 6-7, moderate sea, good visibility
11.00: Wind W, Force 6
11.56: Wind NWN, Force 7
14.00: Wind W, Force 6-7, moderate sea and moderate swell, good visibility
16.00: Wind W, Force 6-7, moderate sea and swell
20.00: Wind WNW, Force 6-7, moderate sea and swell, moderate visibility, occasional rain
22.10: Wind NW, Force 6
23.38: Wind NW, Force 5
23.54: Wind NNW, Force 6

8th August - Porcupine Bank Canyon to northern Porcupine Seabight

02.00: Wind NW, Force 5, moderate sea and swell, good visibility
04.00: Wind NW, Force 5-6, moderate sea and swell, good visibility
08.00: Wind NW, Force 4, moderate sea and swell, good visibility, occasional rain
09.25: Wind NW, Force 5
11.41: Wind NW, Force 5
12.00: Wind WNW, Force 5,
13.49: Wind SW, Force 3, calm seas, partly cloudy, good visibility
16.00: Wind SW, Force 3, calm seas, partly cloudy, good visibility
20.00: Wind W, Force 4, slight sea and swell
22.28: Wind WNW, Force 5
23.56: Wind W, Force 4

9th August - Northern Porcupine Seabight to Galway Bay

02.00: Wind WNW, Force 5, moderate sea, good visibility
04.00: Wind WNW, Force 5, moderate sea, good visibility
08.00: Wind W, Force 3-4, slight sea, good visibility
08.37: Wind W, Force 4
12.05: Wind W, Force 4
14.00: Wind NNW, Force 3, calm sea and slight swell, partly cloudy, good visibility
16.00: Wind W, Force 3, calm sea and slight swell
20.00: Wind W, Force 3, slight sea, good visibility
21.09: Wind WNW, Force 4
22.06: Wind W, Force 4
23.59: Winds light variable, sheltered, good visibility

9th August - Galway Bay to Galway Dock

02.00: Winds light variable, calm sea, good visibility

03.54: End of survey

Acknowledgements

The scientific party would like to thank the crew and officers of RV Celtic Explorer, ROV Holland 1, P and O Maritime, Science Foundation of Ireland, the Marine Institute and the Geological Survey, Ireland for their support, funding and/or contribution to this research.

