PORO-CLIM2 Cruise Report

POrcupine and **RO**ckall margins inform deep-time **CLIM**ate: Did the NA LIP trigger or maintain the PETM?

Cruise CE24010
September 2–21, 2024
Galway, Ireland to Galway, Ireland

Report compiled by John R. Hopper[1,2],
with contributions from
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1. Summary

PORO-CLIM2 is the second phase of the project PORO-CLIM, an international EU-Industry-Irish funded consortium studying the POrcupine and ROckall continental margins to investigate causes of past CLIMate change. The over-arching aim of PORO-CLIM can be summed up in one question: "Did the North Atlantic Igneous Province (NAIP) alone drive Paleocene-Eocene Thermal Maximum (PETM) global climate change event?" The PETM is of urgent societal interest as the closest deep-time analogue of anthropogenic environmental change, as measured by carbon emissions to the atmosphere and associated global warming (though the modern change is happening faster yet). POROCLIM2 was funded by the Irish Marine Research Programme through a ship-time award to Brian O'Reilly, Dublin Institute of Advanced Studies, with co-PI's Stephen Jones, University of Birmingham, and John R. Hopper, Geological Survey of Denmark and Greenland and the University of Copenhagen.

The planned programme involved sampling with the *ROV Holland I*, seabed mapping, and magnetic profiles around Eriador Ridge and Gondor Seamount, volcanic constructs across which the original PORO-CLIM seismic program documented crustal thickness anomalies associated with early Iceland plume influence. In addition the Geological Survey Ireland planned to collect some fill-in multibeam data nearby. The latter programme was cancelled, but an additional add-on program involving sampling of Fanghorn and Edoras banks by Andrew Wheeler, University College Cork, was included since the proposed sampling sites were also nearby.

The programme mobilized beginning September 2 and departed Galway on the morning of September 4 with a science party of 8, plus 6 ROV pilots and crew. On the transit out to the main work area, the weather conditions were good and we did three ROV dives on Fanghorn Bank, before continuing the transit towards Eriador Ridge. The weather and seas picked up sufficiently to preclude ROV work, so we transited to the southernmost of six planned magnetic profiles. The EM302 was turned as we left the area already well covered by multibeam data, and we kept the system on continually while we remained in the unmapped areas. We began collecting the magnetic profiles aiming to position ourselves near Eriador Ridge when the weather would allow an ROV dive. During the third profile, the weather deteriorated slightly, but the quality of the magnetic data was not affected, so we continued along the profile even though the multibeam data quality was becoming quite poor. We did 5 XBT casts along the first of these profiles.

As we turned onto a fourth magnetic profile, the weather improved to the point that an ROV dive was possible, so we pulled in the magnetic tow-fish to transit at maximum speed to the first dive site. Unfortunately, not long after we were on our way, the captain notified us of a medical emergency involving one of the crew and that we needed to head to Galway to get the crewman off the ship, a 2.5 day steam with all engines running. After getting the crewman off, we decided to transit back toward the work area, despite the poor weather forecast 3–4 days out, since the forecast that far in advance may not be accurate. We steamed for a little over a day, but unfortunately the weather prognosis continued to deteriorate. Up to 6 m seas were being forecast during the limited time window we had for work around Eriador Ridge. We decided instead to head back toward the Irish shelf off the Kerry coast, which seemed somewhat protected from the various storm systems moving through the area and was of interest to Andrew Wheeler's group to ground-truth offshore geological maps based on machine learning. We conducted an additional 21 ROV dives on various targets picked from existing multibeam maps. The final cruise track and locations of profiles and sampling sites is shown in Figure 1.

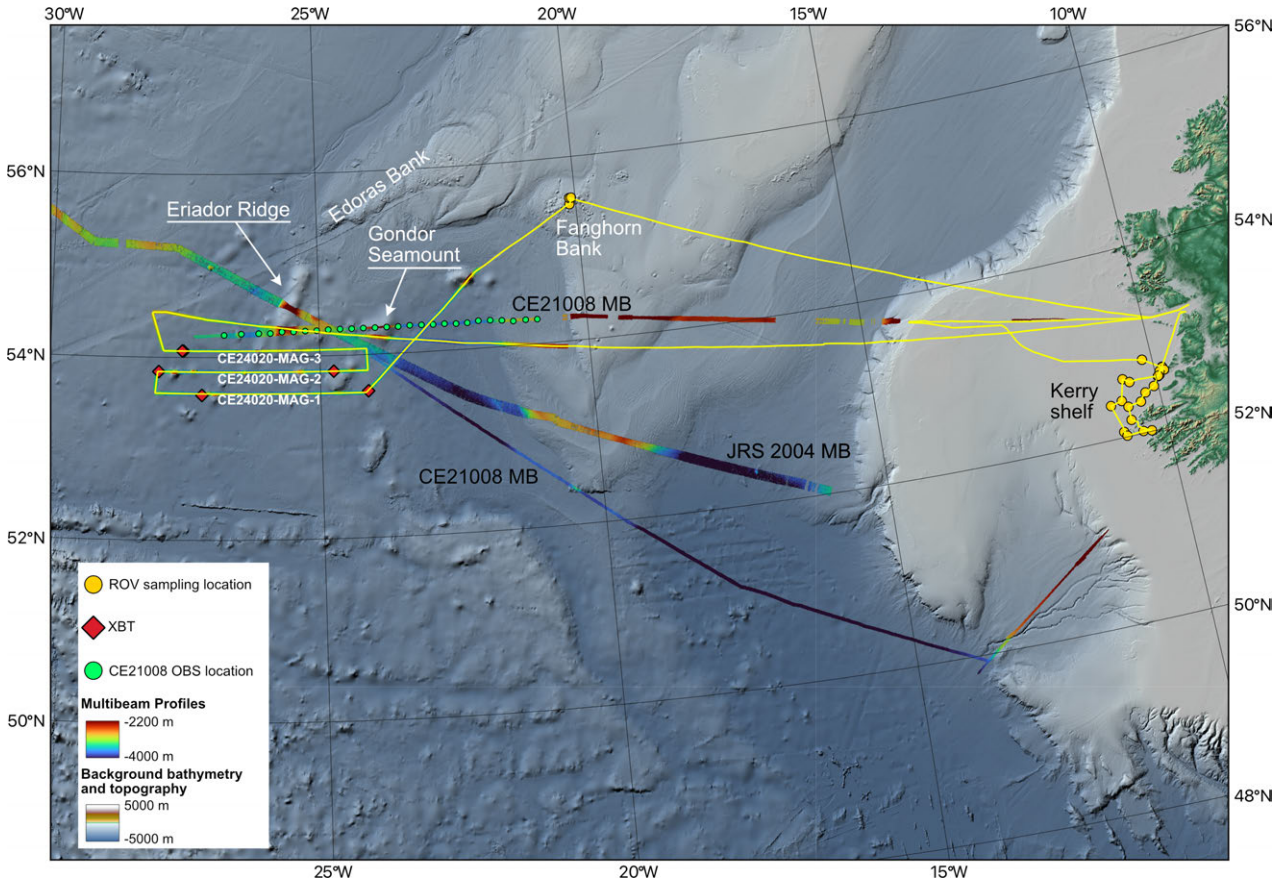


Figure 1. Location of CE24010, the PORO-CLIM 2 cruise. The main sampling target was Eriador Ridge, with additional targets on Gondor Seamount. For the Cork add-on project, the main sampling targets were Fanghorm and Edoras banks. The area off the Kerry coast formed a secondary sampling target. Yellow line is the ship track. Background bathymetry from ETOPO2022. Previous multibeam profiles from the *James Ross Cook* 2004 and *Celtic Explorer* 2021 expeditions also shown. The three new magnetic profiles are labelled.

With hindsight, the decision not to return to Eriador Ridge proved to be a good one. Figure 2 shows the sea-state on Monday, Sept. 16 at 10:00 and the conditions proved to be much worse than the predictions, with 8.8 m seas at the primary dive site.

The public outreach during PORO-CLIM2 was somewhat hampered by the fact the person responsible for coordinating outreach had to cancel participation at the very last minute. Nevertheless, the Birmingham and Danish students were able to put together several posts to various fora, including the geology section's Instagram account at the University of Copenhagen, the GEUS LinkedIn account, and the Birmingham Instagram and Twitter accounts. In addition, Manfredo C., a post-doc at Birmingham wrote a popular science piece for the Italian news media.

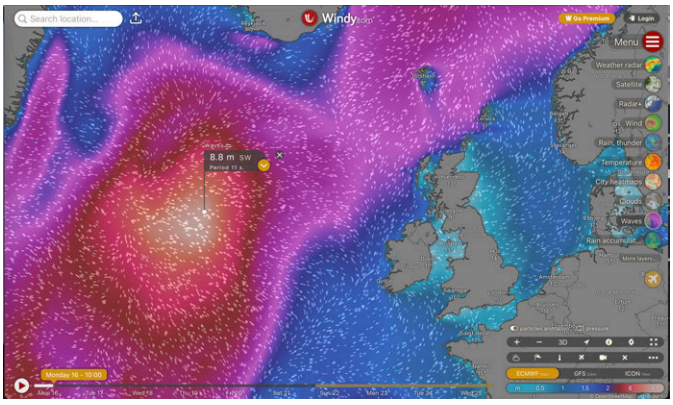


Figure 2. Screenshot of windy.com showing the conditions at Eriador Ridge on Sept. 16.

2. Research Program and Objectives

The primary PORO-CLIM2 objectives were:

1. Conduct a magnetic survey to better identify magnetic spreading anomalies in the area around Eriador Ridge.
2. Detailed swath bathymetry of Eriador Ridge and Gondor Seamount to identify potential sampling targets.
3. ROV photography and sampling of basaltic basement targets on Eriador Ridge and Gondor Seamount.
4. ROV photography and sampling of targets on Fanghorn and Edoras banks for the UCC program.

2.1. Objective 1 - Magnetic Profiles

The area south of Hatton and Rockall banks is poorly covered by magnetic data, complicating interpretations of the spreading anomalies from the Late Cretaceous through the early Paleocene (Figure 2). South of the main PORO-CLIM 1 seismic profile, ambiguity and pinch-outs of linear anomalies may suggest possible ridge jumps and/or off-axis volcanism. To the north, large data gaps make correlation of anomalies nearly impossible. To address this, we planned six profiles approximately perpendicular to the spreading direction and parallel to the seismic profile. We acquired the three profiles south of the CE21080 data, and came on track to begin the first profile to the north, but had terminate as explained above. Each profile was intended to extend from magnetic anomaly C21 (47.3Ma) and into Paleocene–Cretaceous crust.

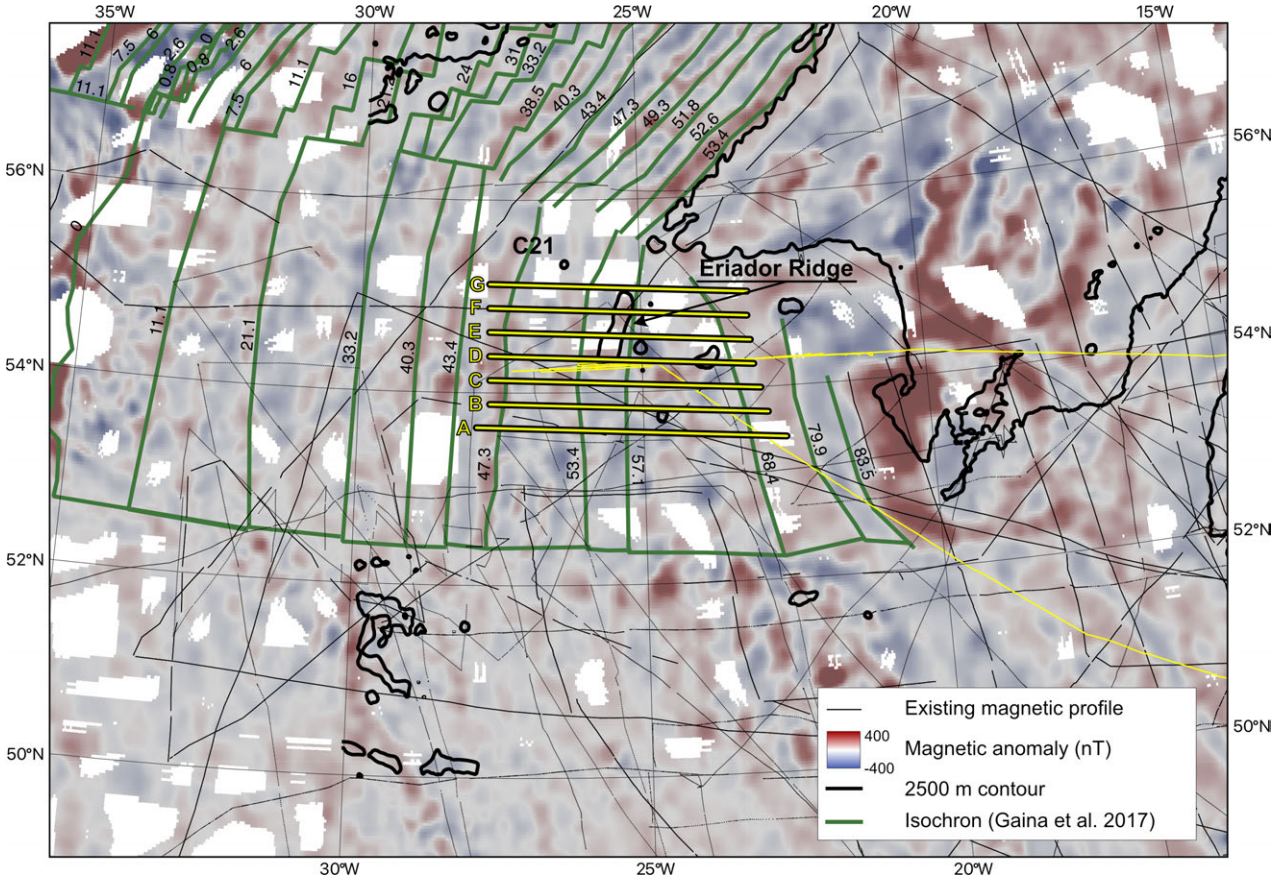


Figure 2. CE21008 ship-track (thin yellow line) superimposed on Emag2 magnetic anomaly map produced using a grid spacing ~5 km and GMT's nearneighbor algorithm with a search radius of ~10 km to highlight the larger data gaps. Note that linear anomalies south of the main study area cannot be reliably traced to the north, where there exist large data gaps. Thick yellow line outlined in black are the originally planned new magnetic profiles.

2.2. Objective 2 - Swath Bathymetry

Because the region falls outside of any areas of interest for extended continental shelf claims, there is relatively little seabed mapping in the region. Most swath bathymetry that exists is from data collected by various ships crossing through the region in transit to other work areas. A single profile crossed the Eriador Ridge collected by the James Clark Ross in 2024 en route to Greenland, and a second profile crossing the Eriador Ridge and Gondor Seamount was collected during PORO-CLIM 1 in 2021. Figure 3 shows the two tracks overlain on the regional Etopo2022 grid (https://www.ncei.noaa.gov/products/etopo-global-relief-model). We planned to survey the southern part of the Eriador Ridge to fill in the data gap between the two surveys (Figure 3).

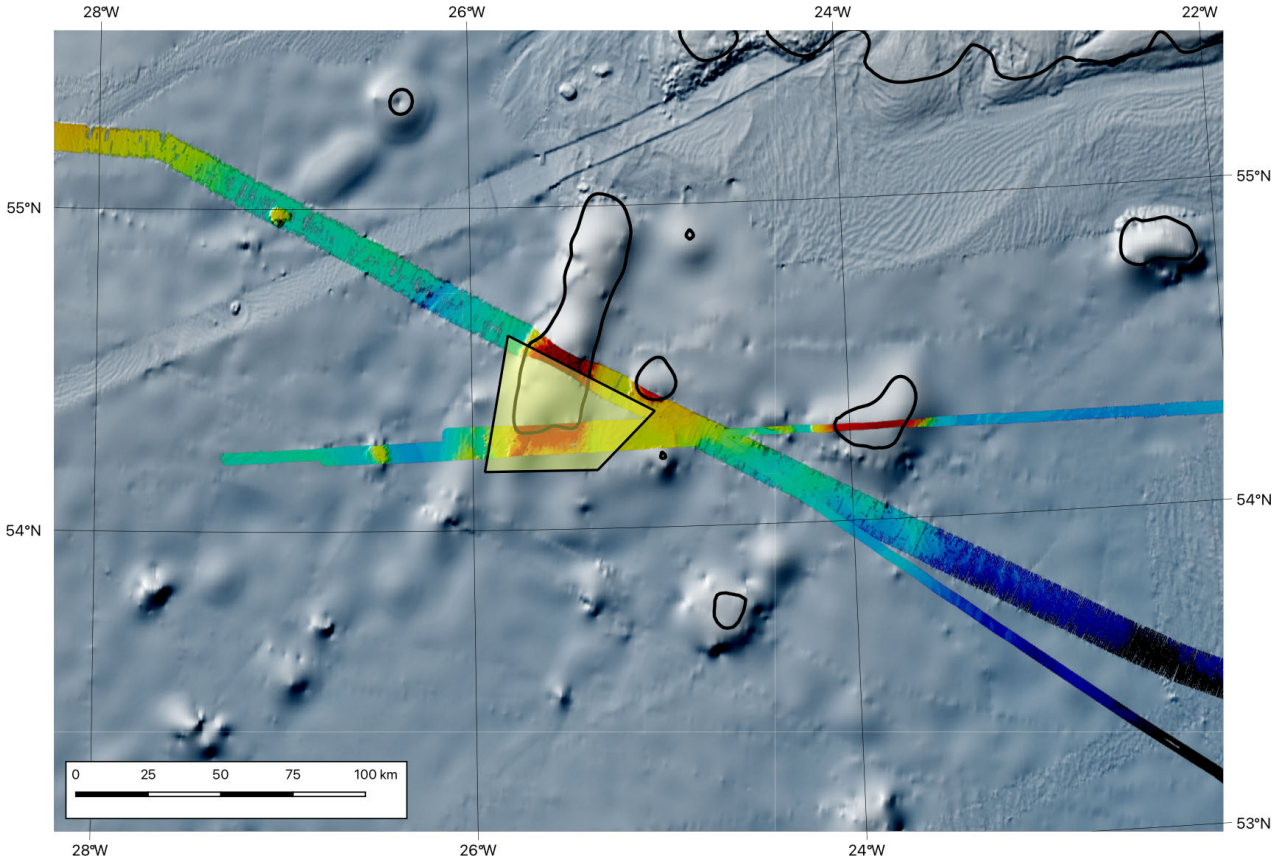


Figure 3. Existing multibeam data over the study prior to POROCLIM 2 includes CE21080 data and *RSS James Clark Ross*. The latter was an acoustic equipment test during a transit to SW Greenland. The yellow box shows the area where we intended to collect additional multibeam data to identify potential dive sites for sampling. Thick black line is the 2500 m bathymetry contour.

2.3. Objective 3 - ROV Sampling, Eriador Ridge and Gondor Seamount

Despite the data gap noted above, the CE21008 data was sufficient to pick possible sampling locations should the weather be favorable as we arrived in the area. We selected two ~ 1 km long transects along two scarps that are approximately a 20° slope as promising targets for sampling basalt (Figure 4).

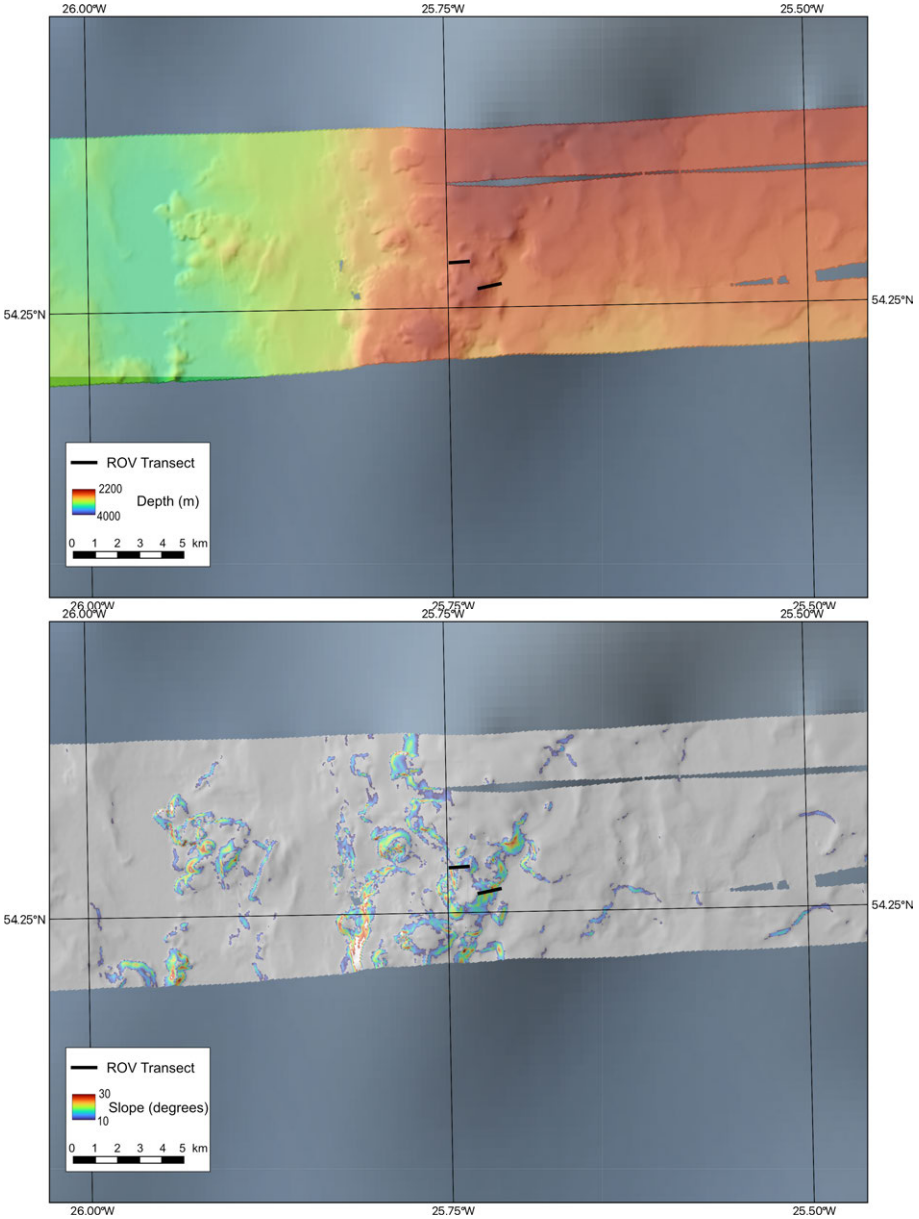


Figure 4. (A) CE21080 multibeam bathymetry gridded at 50 m resolution. Two transects each ~ 1km long along were selected for the first dives on Eriador Ridge. (B) Slope analysis of the bathymetry in (A) highlighting areas with slopes between 10°–30°.

2.4. Objective 4 - ROV Sampling, Fanghorn & Edoras Banks

The sampling plans for the UC Cork program included three possible sites from Fanghorn Bank and seven sites on Edoras Bank based on previous work in the area (Figure 5). Because Fanghorn was on the way to the work area, but Edoras was not, we planned to first head toward Fanghorn to carry out the first ROV sampling if the weather permitted.

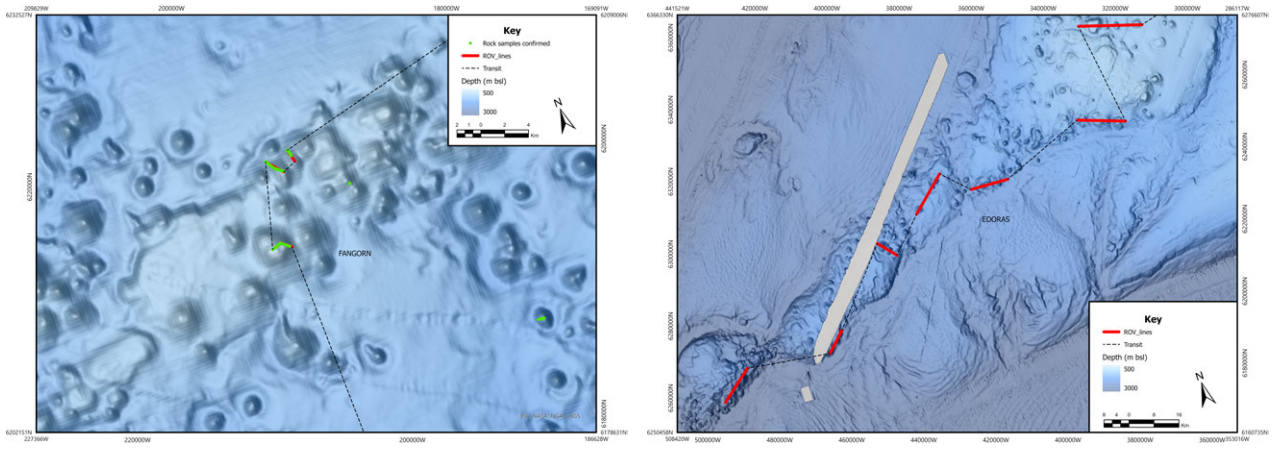


Figure 5. Possible sampling locations for Fanghorn Band (A) and Edoras Bank (B).

3. Cruise Narrative

Monday, 2 September

Danish crew arrived Galway 16:00 and signed on to the ship. Emma notified John and Steve that because of last minutes issues, she was unable to participate in cruise.

Mobilization of ROV was underway, other scientific equipment was on board and ready to mobilize. GEUS supplies and PPE for sampling, cataloging and shipping were brought into the wet lab.

Tuesday, 3 September

Andy Wheeler, Ibrahim Yusef, Naomi Clark, and Manfredo Capriolo all arrived mid-afternoon and Leon Barry-Walsh arrived just after dinner time. Science crew had a security briefing and ship tour before dinner, with Leon to follow in the morning. All equipment was on board and ready to go by early evening.

Wednesday, 4 September

Ship departed Galway at 06:15 and headed two hours west to do the wet test, which was completed just after 12:00. Two German observers for the wet test, however, need to depart the ship, which required returning to Galway before getting underway to the first sampling location on Fangorn Bank.

Andy arranged for Aaron Lim, one of Cork's multibeam experts to give us an operator tutorial over TeamViewer and Zoom. Darragh Duffy, the P&O technician on board was also present so that all were instructed on the basics for operating and keeping the system happy.

After lunch, we held a general science meeting to review plans and procedures and to show watch standers the various stations and procedures for sample cataloging, and standing watch during the geophysical survey.

A general ship's alarm drill took place at 17:40, but no one had put on a gummi suit.

Thursday, 5 September

Transit continued throughout the day. In morning, we tested and trained XBT deployments and all worked fine. Contingency planning and new cruise plans worked on all day. Manfredo gave a short talk on his work with fluid inclusions and what he hopes to get from samples on Eriador Ridge.

Science crew began altering schedules to be on shift by noon tomorrow. Expected ETA to Fangorn is mid afternoon on the 6th.

Friday, 6 September

Just after lunch we arrived at Fangorn Bank and the ROV was off the deck at 11:53 and on the seafloor at 13:01 UTC. The first dive went well and the ROV was back on deck at 16:46 with 8 seabed samples. Manfredo organized all samples in the wet lab for descriptions, cataloging, and bagging. Samples were washed, split with rock hammer, labeled, and bagged while ROV crew prepared for the second dive. The second dive began at 17:44 and was on the bottom at 18:28. The second dive went according plan also and the ROV was back on deck at 21:13 with 8 samples on board and processing the new samples began. The captain was not happy with splitting the rocks on deck using the metal plate because the noise propagated throughout the ship, disturbing anyone trying to sleep, so splitting rocks ceased and samples were set aside for later work. At 22:29, the ROV was off the deck for the 3rd dive and on the sea bottom at 23:25.

Saturday 7. September

Sampling along the third dive transect continued until 03:08 and the ROV was on deck at 03:30 with 5 samples. Samples were washed cleaned and set aside for further working pending a solution to be able to split the samples. Transit to towards either Eriador Ridge or the magnetic profiles began with a final decision on whether to try Eriador, or start the magnetic survey postponed until the morning weather report. In the morning, there was little change in the weather prognosis and Paddy thought that there was, at best, a very slim chance that the conditions for a dive on Eriador would be acceptable. Just before lunch, the decision was made to steam towards the eastern point of magnetic profile A. At 10:28 the multibeam system was turned on and we began pinging and logging for the transit. Data quality was reasonable considering the 10-10.5 kt speed. The magnetic waypoints were entered into the MB system so that the bridge could use the autopilot on the helmsman display. We reached the run-in to the magnetic profile at 21:55 and magetometer deployment began with the ship slowed at 4 kts. The first XBT was deployed at 22:10 while the magnetometer was being deployed. Once deployed the ship sped up to 8 kts for the magnetic profile.

In the evening, the captain notified us of a potential medical problem with one of the crew who developed an infection. If it does not respond to antibiotics, we may need to head to Galway to get him ashore for medical treatment.

Sunday, 8. Sept

The first magnetic profile continued through the most of the day. Both the magnetic data and multibeam data were good quality. At 11:45 we launched a second XBT and the end of the profile was reached at 16:00. We turned north and started the second profile at 18:00 and launched a third XBT at 18:30.

Monday, 9. September

Acquistion along magnetic profile 2 continued with decent quality data on both magnetic and multibeam. We slowed for an XBT at 09:00 and completed profile 2 at 11:59. Turning north, the ship rolled quite a bit on the transit and the mulibeam data quality suffered. By the time we reached the start of profile 3, the wind and

seas increased steadily, but the magnetometer was doing fine despite the poor quality multibeam. At 14:00 we turned onto profile 3. The multibeam data is again poor quality and the beam angle was brought in. But the priority was the magnetic data, so we kept going. Steaming into the wind proved difficult and ship struggled to keep speed. The tow-fish depth was a bit unstable, sinking when we slowed to less than a kt, and coming back up as we were able to gain more speed. The data was slightly noisier, but still good and there appeared to be little tension on the cable given the tow configuration. Seas and wind continued to increase for the rest of the day, peaking in the upper 30's m/s and gusts over 40.

Tuesday, 10. September

Despite the forecast that the wind should come down quickly around midnight, they only slowly receded and winds were still 25-30 m/s around 04:00-05:00. Wind slowed steadily throughout the morning and the ship was able to maintain 5-6 kts by breakfast. In the afternoon, Paddy reviewed the wave prognosis and was optimistic that during the night the seas would be calm enough to give us a 12 hour window to dive on Eriador. The ROV crew would go on standby from 02:00 Wednesday morning. On our current trajectory, we would be able to complete the the magnetic profile 3 and begin profile 4 back towards Eriador. We should be close to the dive sites about the time the seas calm sufficiently to launch the ROV. At 14:43, profile 3 was completed and we headed to the start of profile 4. At 18:09 we turned onto profile 4.

At the 20:00 bridge meeting, the captain informed us that the crew with the infection was not responding to antibiotics and a call was put into to shore to inform his doctor. We decided to pull the magnetometer and steam as fast as possible to the first dive site in hopes of completing a dive before morning. Just before midnight the captain called to say that the situation was worsening considerably and that he decided we need to head to Galway with maximum engines to get the crewman off the ship.

Wednesday, 11. September

The multibeam system was left running during the transit until we reached the overlap with areas mapped by Infomar for the Irish extended shelf program. We collected multibeam until 21°30' W, after which we stopped logging and pinging. The watch in the dry lab was suspended at this point, but watchstanders were advised to keep to their schedules for when we could resume work.

Thursday, 12. September

We continued steaming to Galway. In the morning, we had a TEAMS meeting with Aodhan and Steve to discuss options, especially considering that a strong storm heading to the work area that has been in the model predictions for several days and could severely impact trying to return to Eriador to resume the main part of the work. At a followup meeting in the afternoon, we agreed that a potential window was still possible on Monday and Tuesday to collect additional magnetic profiles, but that we would move them farther east and concentrate north of Eriador, hoping that the storm would stay sufficiently far west to allow us to work there. The forecasts that far out were uncertain enough that we agreed to postpone any final decisions until the weekend. At meeting on the bridge over TEAMS with Aodhan, P&O, the captain, Paddy, and Andy, we agreed that we would head back to the work area as soon as the crewman was off the ship.

Friday, 13. September

Just before 8:00 we arrived at Galway and a small boat met the ship to bring the crewman to shore for medical treatment. We turned around headed back to the work area. A system with strong southerly winds was predicted to move east over the west coast late in the day and early morning Saturday, which would slow

progress and result in a bumpy ride. We agreed to assess the weather predictions Saturday morning when we were on the other side of the current system and could have clearer idea of the ETA to the work areas since we would make slow progress until the system blew over.

Saturday, 14. September

The weather reports continued to worsen. Both models on windy.com showed seas building up as the first of two low pressure systems headed toward the work area. Our ETA to the start of the new magnetic profile, was Sunday late afternoon or evening, at the earliest. By Monday all models predicted well over 5 m seas, heaviest to the west, which would preclude collection of magnetic or multibeam data. While the seas drop to less than 3 m for a brief period, arrival of the second low was predicted to push the seas back over 6 m during Tuesday, abating sometime mid-morning on Wednesday. Winds for the transit home would shift to easterly, which would slow progress to Galway even with two engines. The decision to abandon the remaining Poroclim objectives was reluctantly made and we turned around to head towards alternate shelf sites. Andy spent the rest of the day reviewing potential dive sites to provide the bridge and ROV crew with coordinates.

Sunday, 15. Sept

We reached the first dive site on the shelf at 6:00 and deployed the ROV. The first site was devoid of any sign of bedrock, mostly sand, mud, and boulder/cobble fields with little sign that they are from anything nearby. During the day, we accomplished 6 more dives with considerably better success, with 45 samples in total collected.

Monday, 16. Sept

We continued progressing through the dive sites on the shelf, which went smoothly throughout the day. 8 dives in total were accomplished, and an additional 43 samples collected. We also began the process of making sure that all video data recorded during the dives was backed up to the Marine Institute's drive.

Tuesday, 17. September

We completed 7 dives and recovered 48 samples, finishing the program at 20:30. We began the steam towards Galway with an ETA of 16:00-18:00 on Wednesday.

Wednesday, 18. September

Finished packing all samples and equipment for shipping and transport. Arrived Galway in the evening. Science party to depart Thursday, except for Manfredo, who will depart Saturday as originally scheduled.

4. Preliminary Results

4.1. Objective 1 - Magnetic Profiles

We successfully collected the southern 3 of the initially planned profiles. The magnetometer functioned well during the entire acquisition time and high quality data was collected. Data was collected continuously including through turns. The raw data plot is shown in Figure 6.

While on board, the data for each profile was extracted for comparison to the regional magnetic grid. The international geomagnetic reference field (IGRF) was removed using the 13th generation model (Alken, et al. 2021, doi: 10.1186/s40623-020-01288-x), but no diurnal corrections were made (Figure 7). The overall pattern is consistent with previous data in the region, but details emerge that should aid further interpretation.

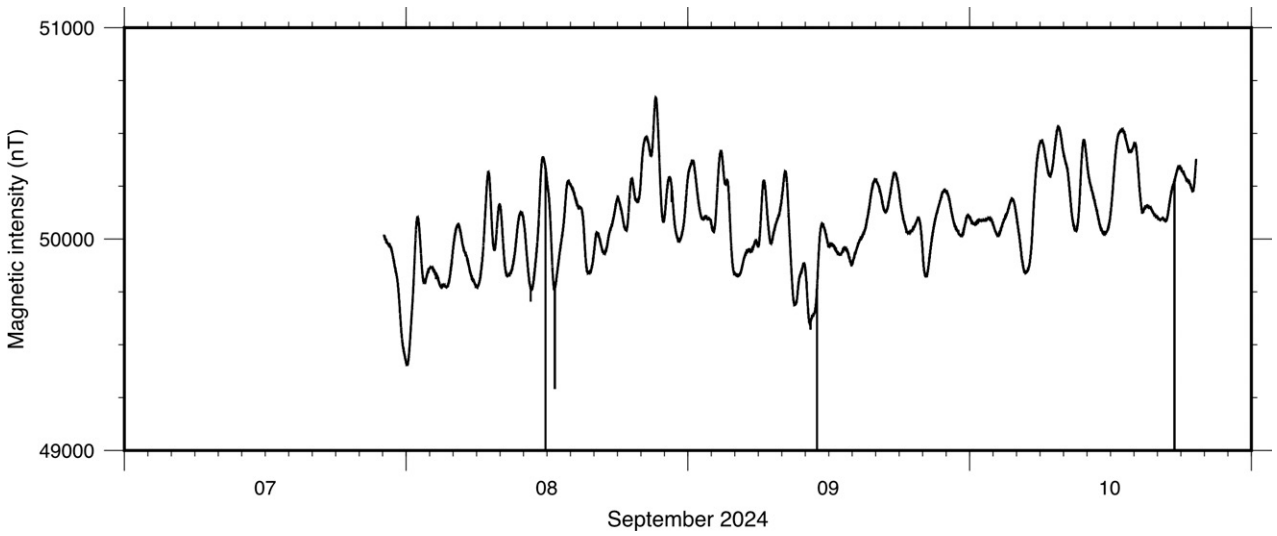


Figure 6. Plot of the raw magnetic data collected on CE24010. The data is excellent quality with only a few spikes that requiring cleaning.

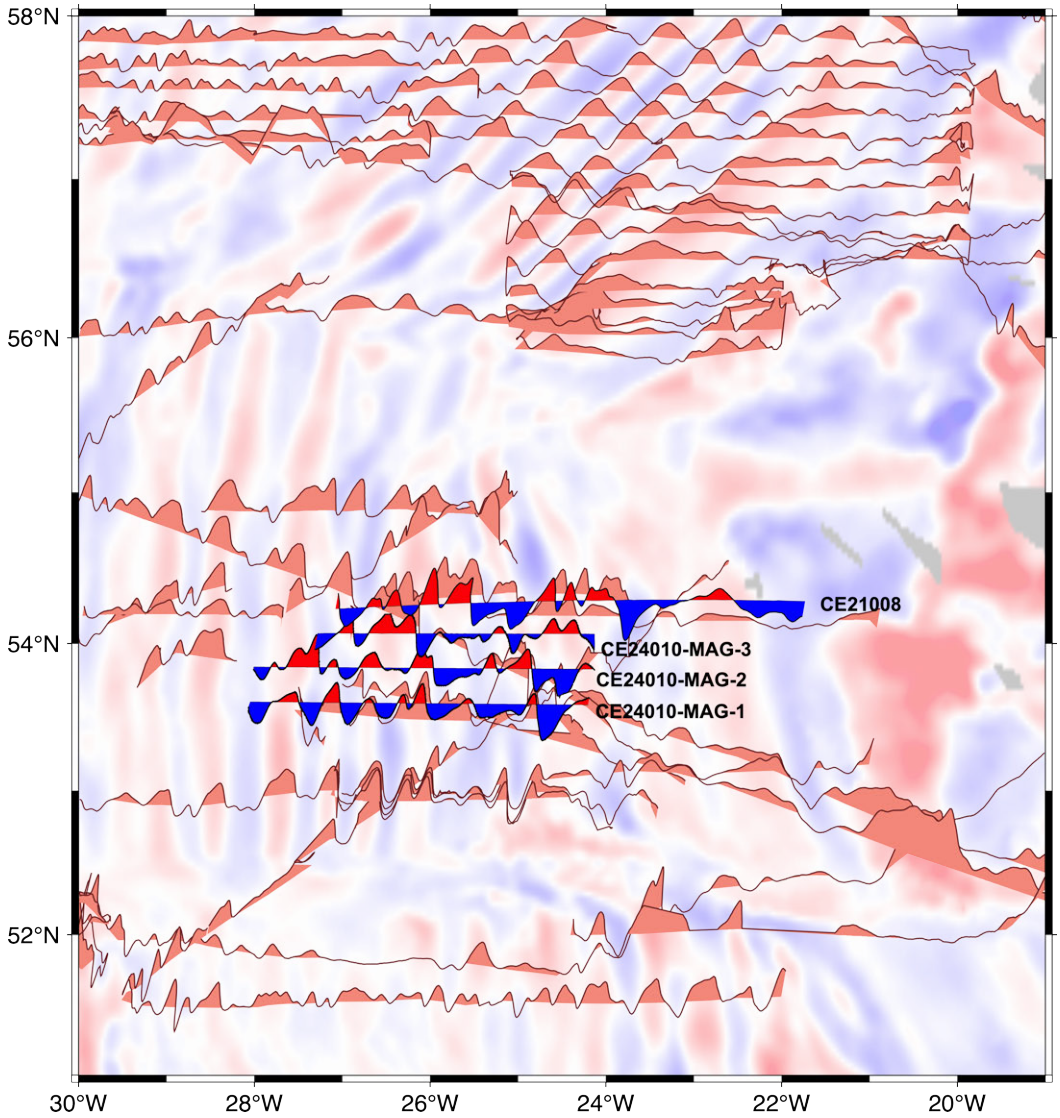


Figure 7. Magnetic data collected on CE24010 after removing the IGRF superimposed on the EMAG2 grid. In contrast to Figure 2, this grid employed directional gridding to enhance linear seafloor spreading anomalies. Also shown is the magnetic profile collected on CE21008, which includes both IGRF corrections and diurnal corrections.

4.2. Objective 2 - Swath Bathymetry

Although we were unable to fill in the area between CE21008 and *RSS James Clark Ross* profile, we collected good quality data during the magnetic survey, which crossed several basement features likely to be volcanic in origin (Figure 8). In addition, we crossed Eriador Ridge and Gondor Seamount on the transit back to Galway, although most of the track over Eriador Ridge duplicated the CE21008 data. On Gondor

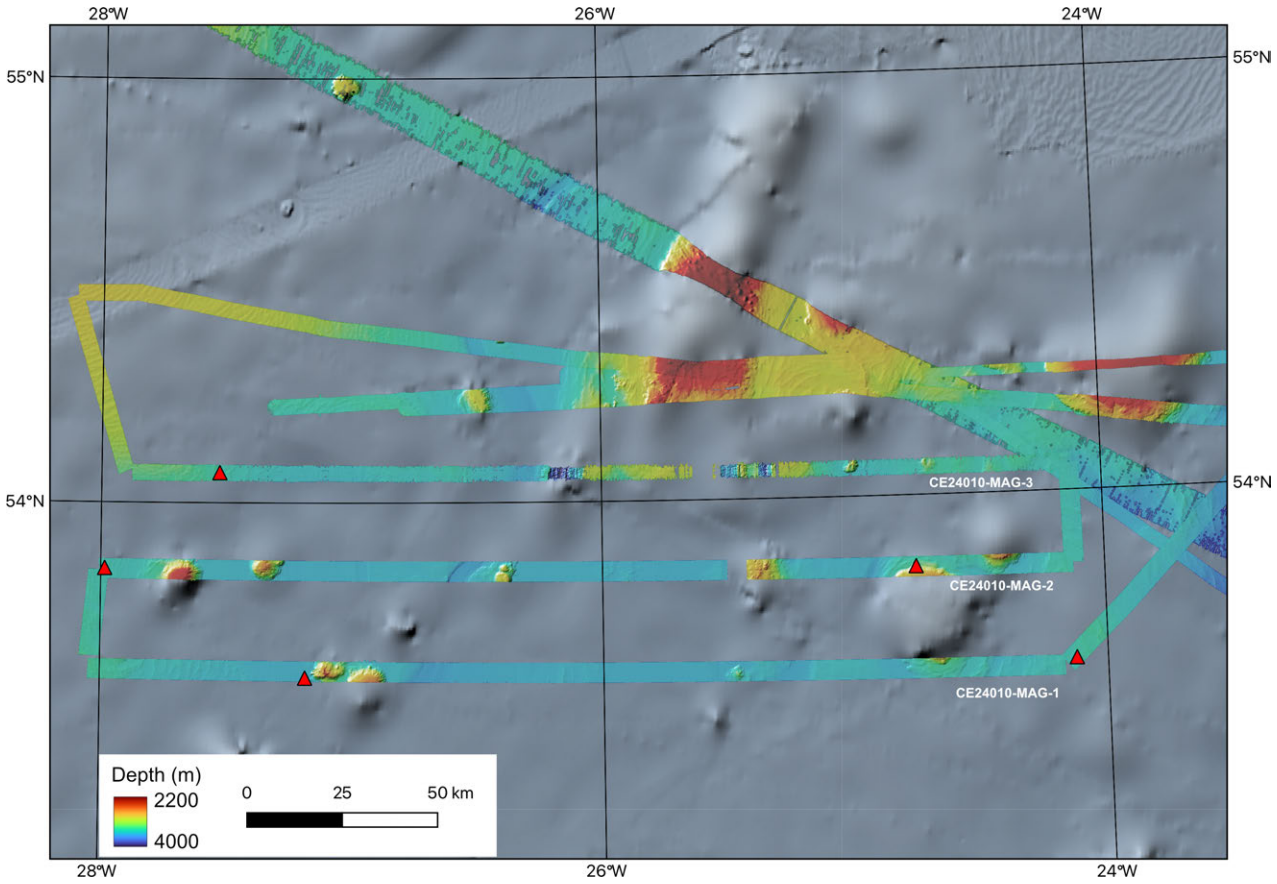


Figure 8. Multibeam bathymetry in the area including the new data in addition to the CE21008 and *RSS James Clark Ross* data. The CE24010 data has been cleaned and all corrections made. Red triangles show locations where sound velocity profiles were taken with XBTs. The overall data quality is very good except for the central part of CE24010-MAG-3 when the weather deteriorated and the system had difficulty finding the seafloor. Some additional cleaning is required in this area as several sections indicate unreasonable depths.

Seamount, additional potential sampling sites were imaged.

For sound-velocity profiles, we deployed five XBTs. The first only recorded to 500 m depth and the second to 720 m, but the last three successfully recorded to ~ 1000 m. To extrapolate the temperature and sound velocity profiles deeper, a database of CTD and XBT data from the region was downloaded from the World Ocean Database maintained by NOAA's National Centers for Environmental Information. All measurements made during August and September were included and an average gradient with depth was determined to extrapolate the XBT data to the seafloor. Figure 9 shows the recorded temperature and sound velocity profiles from CE24010 along with the range indicated by the global database. The velocity profiles were used in processing the multibeam data.

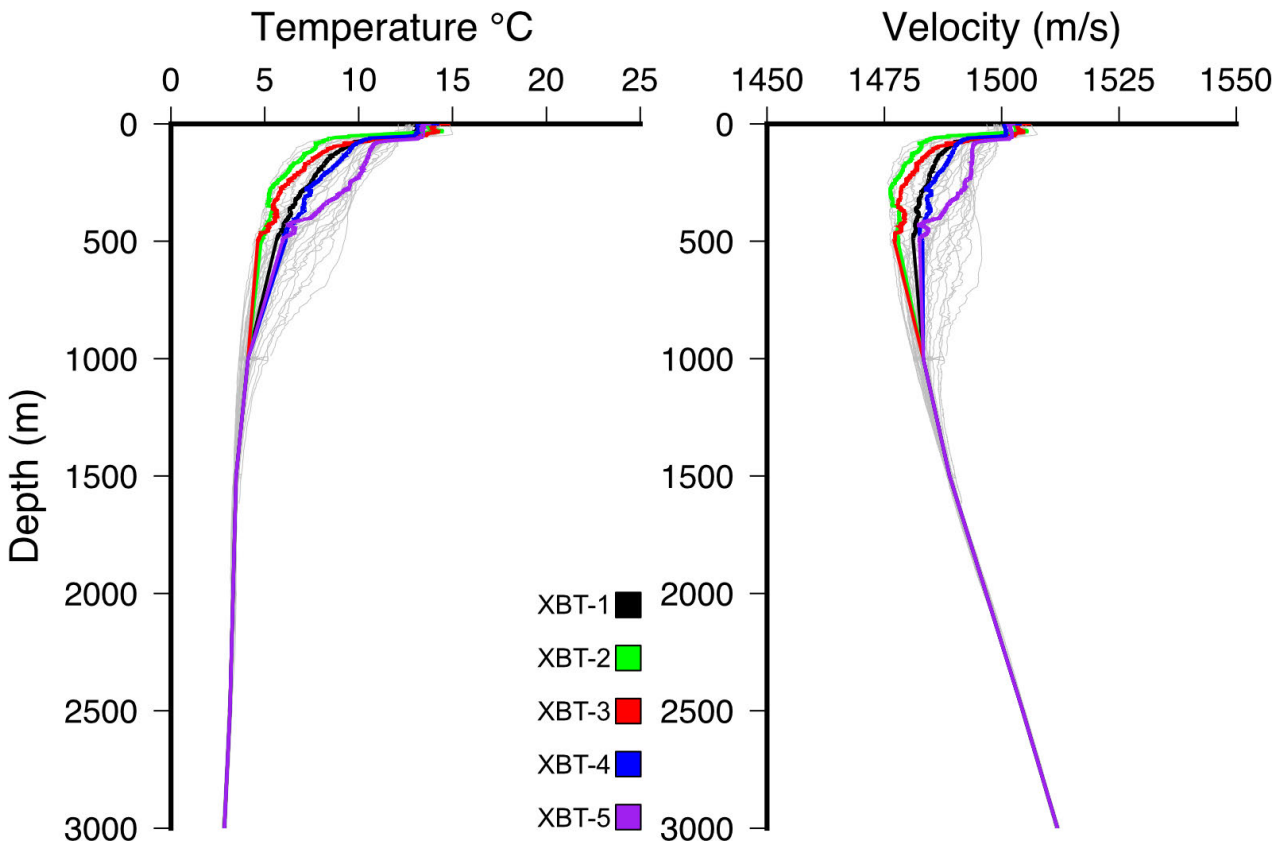


Figure 9. Temperature and sound velocity recorded by the XBTs during acquisition of the magnetic and multibeam profiles. Light grey background plots are CTD and XBT measurements from the same area recorded during the months of August and September that are available from the World Ocean Database. Extrapolation below 1000 m is based on the world database trends.

4.3. Objective 3 - ROV Sampling: Eriador Ridge

Unfortunately, we were unable to sample the main target area because the medical emergency forced us to alter the program several hours before we were scheduled to arrive on site to carry out the two dives.

4.4. Objective 4 - ROV Sampling: Fanghorn & Edoras Banks

En route to the main work area, we successfully carried out three dives on Fanghorn Bank (Figure 10). On the first two dives 8 samples were recovered on each, and on the third dive, 5 samples were recovered for a total of 21 samples. Photographs of the sample baskets were taken prior to emptying the bins and bringing them into the wet lab. Samples were laid out on the table for photographing and cataloguing prior to splitting them open for preliminary descriptions. They were then packed for shipping.

14 samples were a mix of lithologies tentatively identified as granites, gabbroes, sandstones, limestones, serpentinites, among others. 7 of the samples are aphyric basalt and these form a majority of the rock types

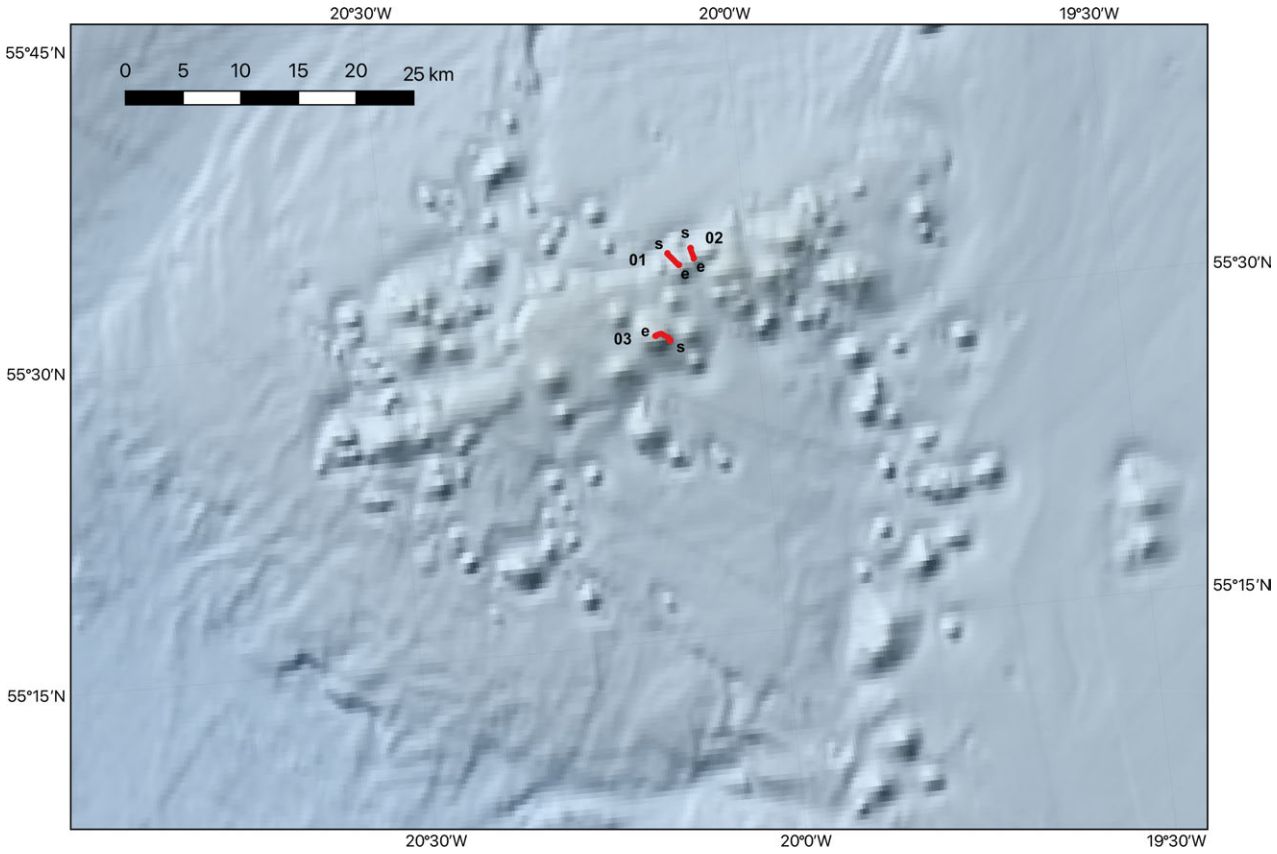


Figure 10. Location of the three ROV dives on Fangorn Bank. The start (s) and end (e) points of each transect are marked.

recovered, suggesting that they are likely related to the underlying basement rocks hypothesized to be volcanic rocks.

4.5. Extra ROV Sampling: Offshore Kerry

After abandoning the attempt to return to the main work area, we headed towards the area off counties Kerry and Clare that weather reports indicated would be relatively sheltered from various storm systems. We successfully completed 21 dives. We retrieved basement rocks from all but two of the sites. The sampling locations are shown in Figure 11. All samples were photographed in the sample baskets prior to transferring them into the wet lab, where they were laid out on the table and photographed again before samples were packed for shipping (see appendix).

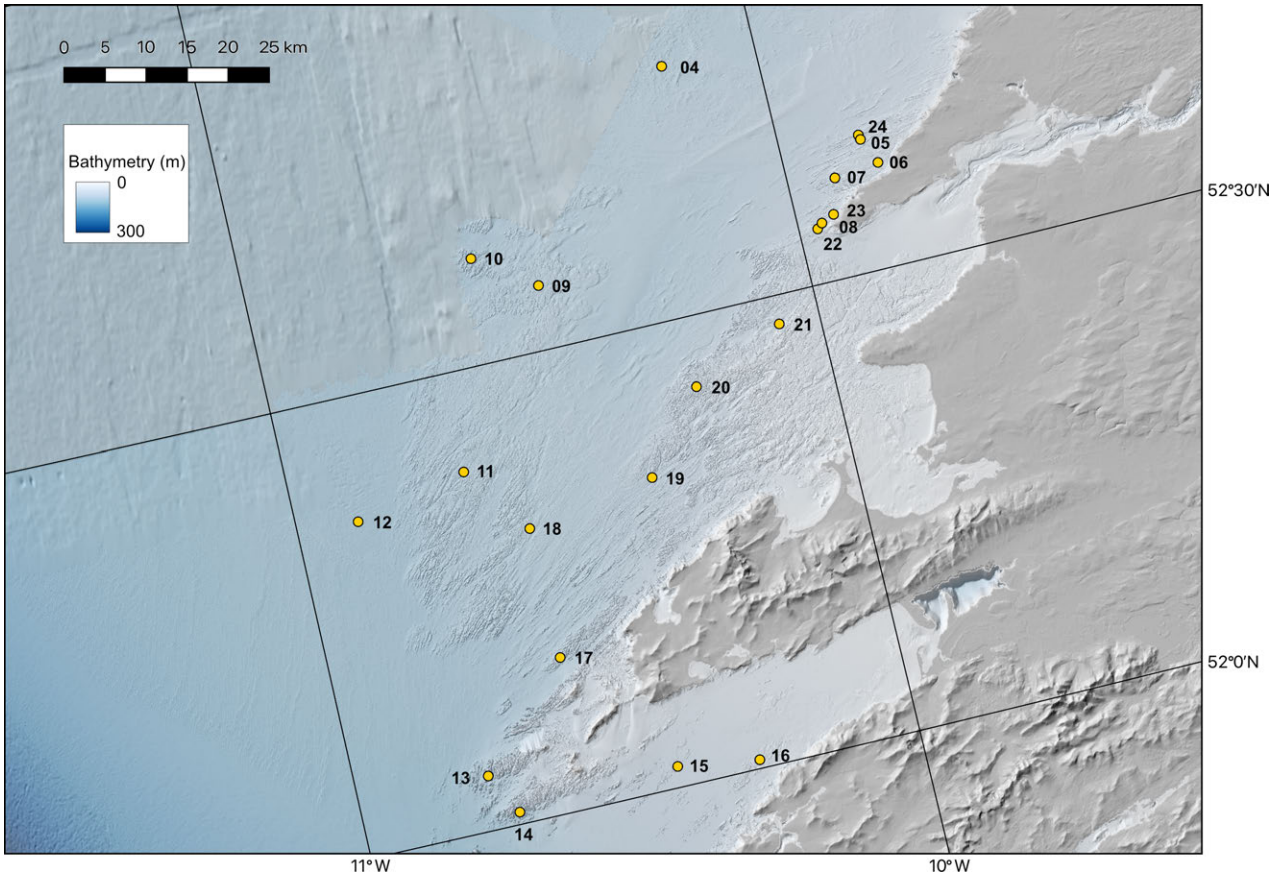


Figure 11. Location of the 21 ROV dives off counties Clare and Kerry. Bathymetry from EMODNET and topography from the ASTOR GDEM database (NASA/METI/AIST/Japan Spacesystems And U.S./Japan ASTER Science Team. (2019). ASTER Global Digital Elevation Model V003 [Data set]. NASA Land Processes Distributed Active Archive Center. https://doi.org/10.5067/ASTER/ASTGTM.003 Date Accessed: 2025-03-31).

5. Data Storage and Availability

Copies of all multibeam and magnetic data have been provided to GEUS, University of Birmhingham, and University College Cork. The raw and processed data will be permanently archived in the GEUS data archive and be made publicly available on the GEUS dataverse site. In addition, processed multibeam data will be sent to GEBCO for incorporation into the global bathymetric databases. There is no moratorium on these data sets.

All rock samples collected from the cruise were sent to University College Cork for further work. Access to sample material is by request to Andrew Wheeler, UC Cork.

6. Participants

CE24010 participants on board

Name	Early career	Gender	Affliliation	Onboard tasks
John R. Hopper	N	M	Geological Survey of Denmark and Greenland & University of Copenhagen, Denmark	Chief scientist, project coPI, science watch leader
Andrew Wheeler	N	M	University College Cork, Ireland	Science watch leader, multibeam, responsible for sampling program
Manfredo Capriolo	Y	M	University of Birmingham, UK	Science watch leader, sampling program and rock descriptions
Ibrahim Yusuf	Y	M	University of Birmingham, UK	Watchstander, magnetic data processing on board
Leon Berry-Walshe	Y	M	Dublin Institute of Advanced Studies, Ireland	Watchstander
Rebekka Danielsen	Y	F	University of Copenhagen, Denmark	Watchstander, multibeam processing
Jonathan Hasselgaard	Y	M	University of Copenhagen, Denmark	Watchstander
Naomi Clarke	Y	F	University of Birmingham, UK	Watchstander

CE24010 participants not sailing

Name	Early career	Gender	Affliliation	Tasks
Stephen Jones	N	M	University of Birmingham, UK	Project PI, regional tectonics
Brian O'Reilly	N	M	Dublin Institute for Advanced Studies, Ireland	Project co-PI, regional tectonics

7. Station List

7.1. Magnetic profiles

Profile	Start of Line				End of Line			
	Date (2024)	Time (UTC)	Lon (°W)	Lat (°N)	Date (2024)	Time (UTC)	Lon (°W)	Lat (°N)
MAG-1	07/09	22:09:46	24.214044	53.586823	08/09	16:09:46	28.045856	53.607572
MAG-2	08/09	18:02:16	28.004779	53.843039	09/09	11:57:30	24.125130	53.827770
MAG-3	09/09	14:00:00	24.131846	54.0640864	10/09	14:42:30	27.898520	54.071506

7.2. XBT casts

Station	Date (2024)	Time (UTC)	Lon (°W)	Lon (min)	Lat (°N)	Lat (min)	Water depth (m)	Notes (see key below)
1	07/09	21:50	24	11.21	53	35.17	3461	O
2	08/09	11:45	27	7.34	53	36.15	3300	O
3	08/09	18:09	27	59.06	53	50.61	3400	O
4	09/09	09:06	24	44.99	54	49.84	3255	O
5	10/09	12:43	27	31.66	54	4.19	3013	O, ship at 5 kts
6	10/09	12:54	27	33.08	54	4.24	3013	O, ship at 5 kts Old P&O T7 XBT, failed at 250 m and not used for processing

Notes Codes:
D Did not launch
E Error message on MK21 console but data appears good
F Copper wire fouled ship or equipment at depth indicated; data below this depth deleted
L Lost data file
N Noisy data, probably not useful
O Specified terminal depth over-ridden to get more/deeper data
X No useful data

7.3. ROV dives

Profile	Start of Line				End of Line			
	Date (2024)	Time (UTC)	Lon (°W)	Lat (°N)	Date (2024)	Time (UTC)	Lon (°W)	Lat (°N)
ROV-1	06/09/2024	11:58:0.31	20.10968735	55.55069064	06/09/2024	16:47:0.97	20.09599981	55.54038271
ROV2	06/09/2024	17:39:0.08	20.07828385	55.55271520	06/09/2024	21:18:0.40	20.07492319	55.54418604
ROV-3	06/09/2024	22:29:16.02	20.11767134	55.48261960	07/09/2024	02:34:0.94	20.13721484	55.48705224
ROV-4	15/09/2024	05:56:0.05	10.17082434	52.77312217	15/09/2024	06:47:9.30	10.17185072	52.77342808
ROV-5	15/09/2024	09:07:0.07	9.85361569	52.64384719	15/09/2024	09:51:59.94	9.85379402	52.64422104
ROV-6	15/09/2024	11:00:0.09	9.83290809	52.61480762	15/09/2024	11:53:59.96	9.83341322	52.61493535

Profile	Start of Line				End of Line			
	Date (2024)	Time (UTC)	Lon (°W)	Lat (°N)	Date (2024)	Time (UTC)	Lon (°W)	Lat (°N)
ROV-7	15/09/2024	13:01:1.83	9.91475110	52.60955475	15/09/2024	13:59:59.95	9.91523575	52.61070440
ROV-8	15/09/2024	15:03:0.05	9.95659572	52.56484137	15/09/2024	15:47:59.91	9.95689650	52.56541635
ROV-9	15/09/2024	18:41:0.09	10.47838915	52.57059098	15/09/2024	20:27:59.17	10.48498510	52.57721407
ROV-10	15/09/2024	23:33:0.03	10.58572371	52.61616209	16/09/2024	00:49:59.90	10.58980635	52.61736950
ROV-11	16/09/2024	03:16:0.07	10.68517428	52.39059199	16/09/2024	04:41:59.90	10.69331383	52.39257211
ROV-12	16/09/2024	06:16:36.00	10.88951217	52.36343317	16/09/2024	07:01:34.00	10.890006	52.36494567
ROV-13	16/09/2024	10:09:0.06	10.76452907	52.05966186	16/09/2024	11:32:0.97	10.76865919	52.05924113
ROV-14	16/09/2024	13:11:0.00	10.72412474	52.01330917	16/09/2024	14:11:59.96	10.72529268	52.01370658
ROV-15	16/09/2024	16:00:0.03	10.43260439	52.02292911	16/09/2024	17:03:59.94	10.43358239	52.02375597
ROV-16	16/09/2024	18:08:0.05	10.28799159	52.00945042	16/09/2024	18:40:59.92	10.28907404	52.00899046
ROV-17	16/09/2024	21:12:0.00	10.59225261	52.16852095	16/09/2024	22:17:59.92	10.59268666	52.17107180
ROV-18	16/09/2024	23:52:0.03	10.59289929	52.31381496	17/09/2024	02:13:59.21	10.60246287	52.31855374
ROV-19	17/09/2024	03:57:0.07	10.35899038	52.33758678	17/09/2024	06:04:59.91	10.36706800	52.34653229
ROV20	17/09/2024	07:39:0.03	10.24428845	52.42269455	17/09/2024	08:38:59.19	10.24052132	52.42156698
ROV21	17/09/2024	10:14:0.05	10.07372018	52.46842719	17/09/2024	11:26:59.96	10.07104295	52.46619940
ROV22	17/09/2024	13:19:0.09	9.96647229	52.55971271	17/09/2024	14:14:59.90	9.96768217	52.56056145
ROV23	17/09/2024	15:41:0.09	9.93261813	52.57108655	17/09/2024	17:08:59.93	9.93937084	52.57552866
ROV24	17/09/2024	18:26:0.03	9.85546103	52.64910853	17/09/2024	19:12:59.93	9.85831391	52.65004569

8. Outreach Program

Although the original plan was to have a relatively active public outreach program, we scaled back significantly do to the short-handed staffing. The person coordinating the outreach who had planned significant activities could not sail, so many of the planned activities could not be realized.

Date	Person/People	Activity
06/09/2024	Ibrahim Yusuf	Posts on Instagram and Twitter
07/09/2024	Jonathan Hasselgaard Rebekka Danielsen	Post on GEUS Linked In
07/09/2024	Ibrahim Yusuf	Posts on Instagram and Twitter
08/09/2024	Ibrahim Yusuf	Posts on Instagram and Twitter
10/09/2024	Jonathan Hasselgaard Rebekka Danielsen	Post on KU Instagram
11/09/2024	Jonathan Hasselgaard Rebekka Danielsen	Post on KU Instagram
11/09/2024	Jonathan Hasselgaard Rebekka Danielsen	Post on GEUS Linked In with ROV Dive video
11/09/2024	Ibrahim Yusuf	Posts on Instagram and Twitter
13/09/2024	Jonathan Hasselgaard Rebekka Danielsen	Post on KU Instagram

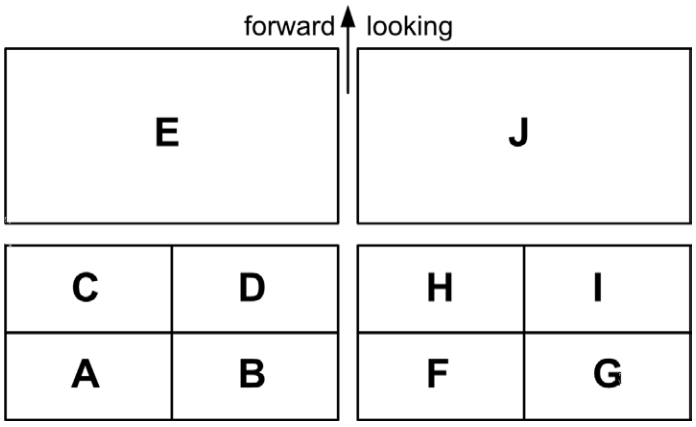
Date	Person/People	Activity
14/09/2024	Ibrahim Yusuf	Posts on Instagram and Twitter
18/09/2024	Manfredo Capriolo	News article for Italian science magazine

9. Acknowledgements

We thank the captain and the crew of the *Celtic Explorer* for their hard work and efforts to help get as much science work accomplished as possible given the often difficult circumstances. We also the thank the *Holland I* team for their hard work and professionalism to collect nearly one ton of rock samples. Finally, we thank onshore support from P&O who were efficient and helpful at all stages from pre-cruise to final demobilization.

Appendix - ROV dive logs, pictures, and rock descriptions descriptions

To ensure we had an accurate location of all samples, and did not misplace any, we set up a procedure where each sample was placed into a specific basket on the ROV which was logged as samples were taken. Two large and 8 small baskets were arranged as follows:



After pulling out the tray, the samples were photographed while still in the baskets. Each sample was then transferred to the table in the wet lab on similarly labeled places, and the collection photographed again. Finally, photographs of each individual sample was taken. Samples were then dried as much as possible, labeled on the rock with a sharpie marker, and transferred to labeled sample bags. Samples were then packed into rice bags for shipping.

For each dive, this appendix includes the dive log, the sample log sheets, and the basket and table photos. Individual sample photos are not included.

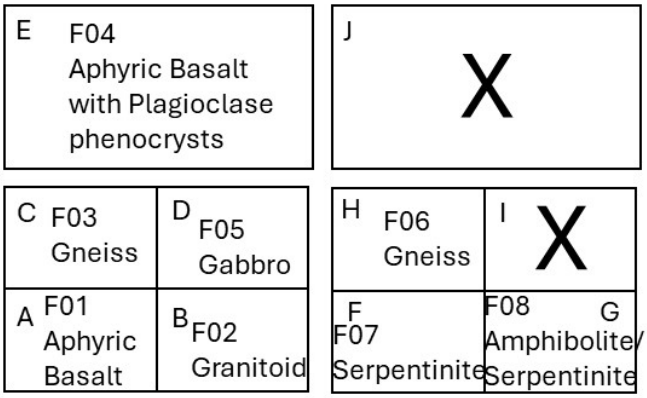
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV1 Scientists Andy /Manfredo
Date: 6/9/2024 Location: Fangorn

Time	Lat Deg	Min	Long Deg	Min	Depth (m)	Observation
13.00	55	33.04	20	6.62	1159	On bottom
13.03	55	33.04	20	6.62	1159	HD recording started
13.15	55	33.044	20	6.6222	1157	Lasers on and **F01 rock samplecollected**
13.19	55	33.0336	20	6.608	1154	**F02 rock sample collected**
13.23	55	33.021	20	6.59	1149	on mnove for c.200m
13.47	55	32.9296	20	6.4643	1120	**F03 rock sample collected**
14.01	55	32.8691	20	6.3885	1082	Landed for F04
14.04	55	32.8691	20	6.387	1088	**F04 rock sample collected**
14.28	55	32.7462	20	6.21093	1020	Area of hardground
14.31	55	32.746	20	6.21136	1020	**F05 rock sample collected**
14.32	55	32.746	20	6.21136	1020	Change media. HD recording started non second tape
14.51	55	32.6641	20	6.0997	952	Rock pavement with boulders on it
14.51	55	32.6641	20	6.0997	952	**F06 rock sample collected**
15.10	55	32.5835	20	5.9943	888	Off of rock pavement
15.20	55	32.5447	20	5.9357	881	Back on exposed rock with stones, ROV passes over ridge
15.23	55	32.544	20	5.9367	878	**F07 rock sample collected**
15.28	55	32.5448	20	5.9319	882	**F08 rock sample collected.** Small isolated rock
15.54	55	32.4581	20	5.8181	859	2nd rock ridge with rocks but couldn't pick any up
16.04	55	32.4291	20	5.7632	866	Stop HD. End of dive

ROCK SAMPLE LOG SHEET

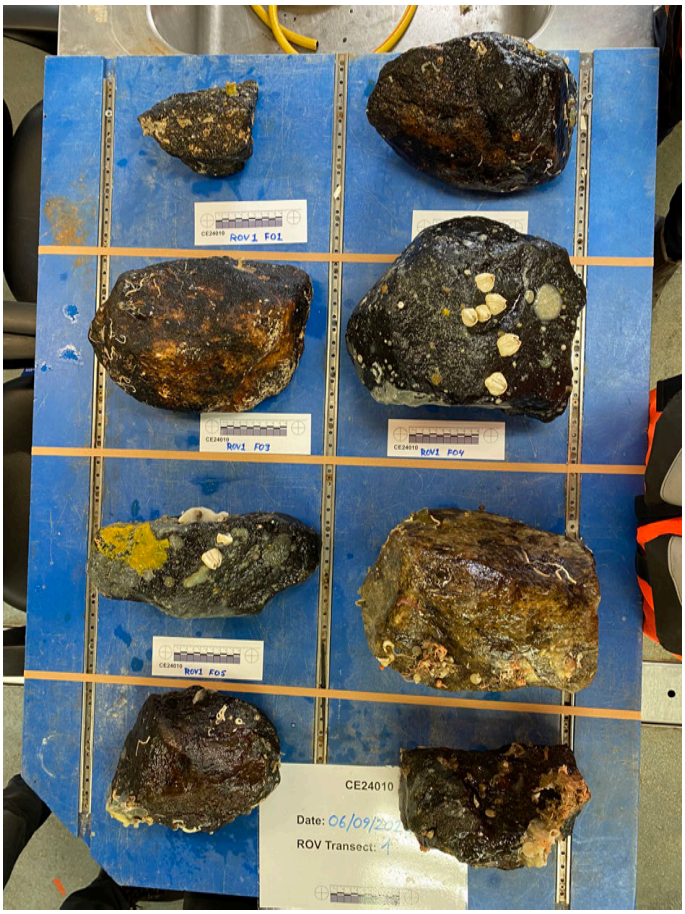
Survey: CE24010 PoroClim2
Date: 06/09/2024
Dive: **CE24010_ ROV1**
Location: **Fangorn**
Scientists: Andy Wheeler / Naomi / Leon



Box	Sample	Lat (N)	Long (W)	Depth (m)	Time	Comment
A	F01	55° 33.043	20° 6.624	1155	13.11	**Aphyric Basalt** (NB some minor [10s m] inaccuracies in position and depth). In situ?
B	F02	55° 33.0336	20° 6.6080	1154	13.19	Granitoid (NB some minor [10(NB some minor [10s m] inaccuracies in position and depth IRD?
C	F03	55° 32.9296	20° 6.4643	1120	13.47	Slightly foliated Gneiss (NB some minor [10s m] inaccuracies in position and depth) IRD?
D	F05	55° 32.746	20° 6.2109	1020	14.33	**Gabbro** In situ?
E	F04	55° 32.8692	20° 6.3887	1088	14.05	**Pyritic Basalt with plagioclase phenocrysts** (NB some minor [10s m] inaccuracies in position and depth) In situ?
F	FO7	55° 32.544	20° 5.9396	882	15.23	Serpentinite?? In site? / IRD?
G	F08	55° 32.5447	20° 5.932	882	15.28	Microcrystalline amphibolite/ serpentinite? IRD?
H	F06	55° 32.6638	20° 6.0966	953	14.55	Well foliated gneiss IRD?
I						
J						

CE24010-ROV1 Basket photo

CE24010-ROV1 Wet lab photo



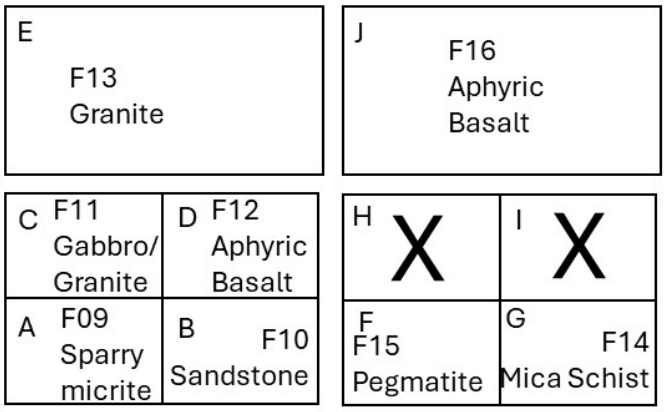
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV2 Scientists Andy Wheeler/Leon
Date: 6/9/2024 Location: Fangorn

Time	Lat Deg	Min	Long Deg	Min	Depth (m)	Observation
18.28	55	33.16317	20	4.6141	1068	HD recording started
18.31	55	33.162	20	4.6138	1068	**F09 rock sample collected** on fractured hardground pavement
18.35	55	33.6078	20	4.6149	1067	**F10 rock sample collected**
18.57	55	33.058	20	4.632	1038	**F11 rock sample collected**
19.00	55	33.049	20	4.63125	1034	Travelling across exposed flat bedrock
19.10	55	32.9908	20	4.6013	1012	A continuation fo lots of rocks
19.18	55	32.959	20	4.5902	1003	**F12 rock sample collected.** On bedrock
19.23	55	32.959	20	4.5902	1003	**F13 rock sample collected.** Collected next to F12 **.** On bedrock
19.37	55	32.8744	20	4.55175	970	Bedrock exposure again
19.44	55	32.8361	20	4.5324	955	New HD cartridge loaded
19.48	55	32.8362	20	4.5322	955	**F14 rock sample collected.**
20.09	55	32.7539	20	4.4807	917	**F15 rock sample collected** on hard pavement
20.19	55	32.7543	20	4.481	917	**F16 rock sample collected.** Next to F15
20.42	55	32.6659	20	4.4593	859	End dive. HD off

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 06/09/2024
Dive: **CE24010_ ROV2**
Location: **Fangorn**
Scientists: Andy Wheeler / Manfredo / Leon



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	F09	55° 33.162	20° 4.6138	1068	18.31	Sparmicrite Limestone
B	F10	55° 33.6078	20° 4.6149	1067	18.35	Sandstone?
C	F11	55° 33.058	20° 4.632	1067	18.57	Gabbro/Granite contact
D	F12	55° 32.9602	20° 4.5903	1003	19.22	Aphyric basalt
E	F13	55° 32.9602	20° 4.5903	1003	19.23	Granite
F	F15	55° 32.7544	20° 4.4818	917	20.15	Pegmatite
G	F14	55° 32.8357	20° 4.5324	955	19.52	Mica schist
H						
I						
J	F16	55° 32.7543	20° 4.4810	917	20.19	Aphyric basalt

CE24010-ROV2 Basket photo

CE24010-ROV2 Wet lab photo

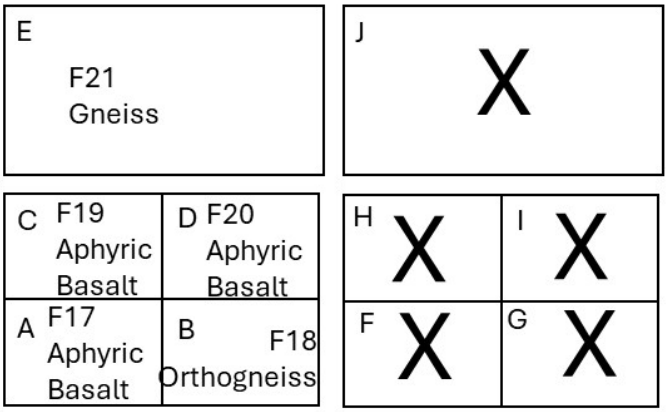
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV3 Scientists Andy/ Manfredo
Date: 6-7/9/2024 Location: Fangorn

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
23.23	55	29.0071	20	7.1105	931	A lot of sharks
23.25	55	29.0071	20	7.1105	931	HD recording turned on
0.03	55	29.0944	20	7.2084	860	**Rock sampling** for **F17 to F2**0 at base of slope. Now heading up
0.34	55	29.1807	20	7.4055	729	Lots of coreal thickets
0.58	55	29.2844	20	7.65157	743	Larghe plateau are of sand and dropstones
1.08	55	29.31007	20	7.748	741	HD recording stopped and new HD loaded
1.11	55	29.32338	20	7.75901	741	HD recording turned on for second cartridge
1.33	55	29.3011	20	7.938	735	Pebbly plain continues with semi-lithified hardgrounds and dropstones
2.03	55	29.2433	20	8.2858	688	End of dive, stopped recording

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 06/09/2024 to 07/09/2024
Dive: **CE24010_ ROV3**
Location: **Fangorn**
Scientists: Andy Wheeler / Manfredo / Leon



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	F17	55° 29.0239	20° 7.1281	921	23.35	**Microcystalline aphyric basalt** In situ?
B	F18	55° 29.0235	20° 7.1268	922	23.40	Grey banded Orthogneiss IRD?
C	F19	55° 29.0595	20° 7.1628	897	23.55	**Aphyric basalt** In situ?
D	F20	55° 29.0595	20° 7.1628	897	23.55	**Aphyric amygdaloidal basalt** In situ?
E	F21	55° 29.1282	20° 7.2684	818	00.20	Gneiss IRD?
F						
G						
H						
I						
J						

CE24010-ROV3 Basket photo

CE24010-ROV3 Wet lab photo

ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV4 Scientists AW/RED
Date: 15/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
5:51	52	46.3879	-10	10.2490	97	On bottom
5:56	52	46.3808	-10	10.2478	97	HD on, heading south
6:08	52	46.3340	-10	10.2550	94	Turning south-west ridge of boulders
6:14	52	46.3194	-10	10.2836	96	Heading west to next ridge/dock?
6:19	52	46.3190	-10	10.3343	95.5	Back on boulder ridge
6:21	52	46.3100	-10	10.3501	96.1	Turning south, laterally moving to the north
6:24	52	46.3175	-10	10.3505	95	Turning north, heading back over the ridge to the next
6:36	52	46.3681	-10	10.3473	96	Heading north-east, 3rd ridge
6:46	52	46.4050	-10	10.3122	96	End of dive, NO BEDROCK FOUND, HD stopped recording

ROV DIVE 4

No samples because no bedrock found.

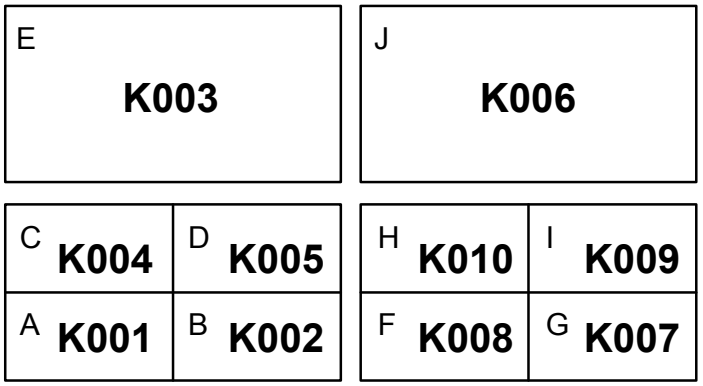
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV5 Scientists Andy / Leon
Date: 15/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
9:07	52	38.6318	-9	51.2173	67.5	On bottom, HD started
9:09	52	38.6318	-9	51.2173	67.5	Sample 1, clear bedrock visible K001
9:11	52	38.6318	-9	51.2173	67.5	Sample 2, clear bedrock visible K002
9:14	52	38.6318	-9	51.2173	67.5	Sample 3, clear bedrock
9:16	52	38.6339	-9	51.2195	66.9	Move to second landing for sampling
9:18	52	38.6339	-9	51.2195	66.9	Sample 4, clear bedrock K004
9:19	52	38.6339	-9	51.2195	66.9	Sample 5, clear bedrock K005
9:25	52	38.6428	-9	51.2226	66.6	Move to third landing for sampling (forward 14m North)
9:28	52	38.6428	-9	51.2226	66.6	Sample 6
9:28	52	38.6428	-9	51.2226	66.6	Moving to fourth landing for sampling
9:30	52	38.6422	-9	51.2251	66.5	Arrive at fourth landing
9:31	52	38.6422	-9	51.2251	66.5	Sample 7, K007
9:37	52	38.6422	-9	51.2251	66.5	Sample 8, K008
9:41	52	38.6542	-9	51.2274	67.3	Move to fifth landing for sampling North
9:47	52	38.6542	-9	51.2274	67.3	Sample 9, K009
9:50	52	38.6542	-9	51.2274	67.3	Sample 10, K010
9:51	52	38.6542	-9	51.2274	67.3	End of dive, HD off

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 15/9/2024
Dive: CE24010_ ROV 5
Location: Offshore Kerry
Scientists: Andy Wheeler



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K001	52°38.6318	9°51.2173	67.5	9:09	Next to clear bedrock, med-big
B	K002	52°38.6318	9°51.2173	67.5	9:11	Next to clear bedrock, small-med
C	K004	52°38.6339	9°51.2195	66.9	9:18	Next to clear bedrock
D	K005	52°38.6339	9°51.2195	66.9	9:19	Next to clear bedrock
E	K003	52°38.6318	9°51.2173	67.5	9:14	Next to clear bedrock, big+flat
F	K008	52°38.6422	9°51.2251	66.5	9:37	Clear bedrock
G	K007	52°38.6422	9°51.2251	66.5	9:31	Next to clear bedrock
H	K010	52°38.6542	9°51.2274	67.3	9:50	Next to clear bedrock
I	K009	52°38.6542	9°51.2274	67.3	9:47	Next to clear bedrock
J	K006	52°38.6428	9°51.2226	66.6	9:28	Next to clear bedrock

CE24010-ROV5 Basket photo

CE24010-ROV5 Wet lab photo

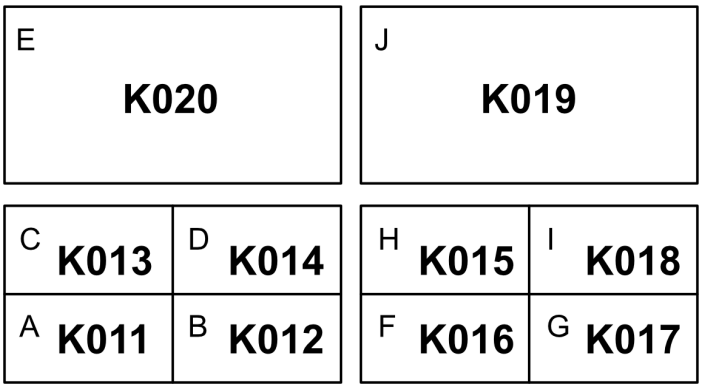
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV6 Scientists Andy Wheeler and Ibrahim Yusuf
Date: 15/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
11:00	52	36.8898	-9	49.9749	50.5	HD on
11:11	52	36.9048	-9	49.9704	52	On bottom trying to sample
11:12	52	36.9048	-9	49.9704	52	Sample: K11
11:15	52	36.9048	-9	49.9704	52.3	Sample: K12
11:17	52	36.9053	-9	49.9672	52.3	Sample: K13
11:20	52	36.82	-9	48.9	50.5	Heading west for new sample sites
11:28	52	36.9024	-9	49.9837	52	On bottom for sampling
11:31	52	36.9024	-9	49.9837	52	Sample: K14
11:32	52	36.9024	-9	49.9837	52	Sample: K15
11:35	52	36.9024	-9	49.9837	52	Sample: K16
11:42	52	36.8996	-9	49.9959	51.5	On bottom for sampling
11:44	52	36.8996	-9	49.9959	51.5	Sample: K17
11:45	52	36.8996	-9	49.9959	51.5	Sample:K18 -> heading west for new sample sites
11:50	52	36.8951	-9	50.0033	52.5	On bottom for sampling
12:50	52	36.8951	-9	50.0053	52.5	Sample: K19
12:52	52	36.8951	-9	50.0053	52.5	Sample: K20
12:53		36.8951	-9	50.0053	52.5	End of dive HD off

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 15/09/2024
Dive: CE24010_ ROV 6
Location: Offshore Kerry
Scientists: Andy Wheeler / Ibrahim Yusuf



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K011	52°36.9048	9°49.9704	52	11:12	
B	K012	52°36.9048	9°49.9704	52.3	11:15	
C	K013	52°36.9053	9°49.9672	52.3	11:17	
D	K014	52°36.9024	9°49.9837	52	11:31	
E	K020	52°36.8951	9°50.0053	52.5	11:52	
F	K016	52°36.9024	9°49.9837	52	11:35	
G	K017	52°36.8996	9°49.9959	51.5	11:44	
H	K015	52°36.9024	9°49.9837	52	11:33	
I	K018	52°36.8996	9°49.9959	51.5	11:45	
J	K019	52°36.8951	9°50.0053	52.5	11:50	

CE24010-ROV6 Basket photo

CE24010-ROV6 Wet lab photo

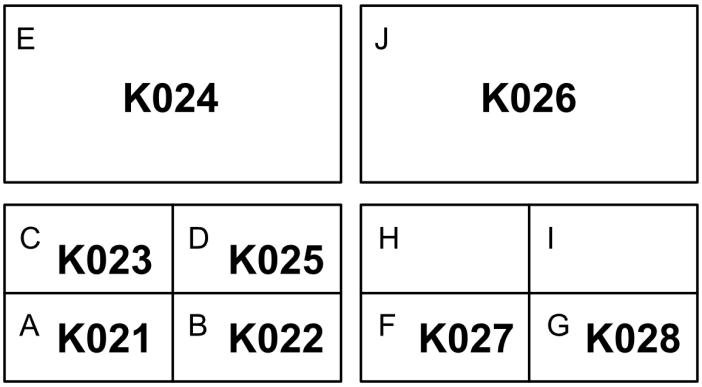
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV7 Scientists Andy Wheeler and Manfredo
Date: 15/9/2024 Location: Offshore Kerry

Time	Lat Deg	Min	Long Deg	Min	Depth (m)	Observation
13.01	52	36.5749	-9	54.8983	55.8	Start dive (reached sea bottom) HD on
13.07	52	36.5781	-9	54.898	54.3	Sample K021
13.09	52	36.5781	-9	54.898	54.3	Sample K022
13.14	52	36.5781	-9	54.898	54.3	Sample K023 then heading W on initial dive spot
13.24	52	36.57921	-9	54.92576	59.5	At dive spot ready to sample
13.26	52	36.57925	-9	54.92572	59.4	Sample K024
13.28	52	36.57925	-9	54.92572	59.5	Sample K025, took 2, left 1
13.28	52	36.57925	-9	54.9257	59.5	Sample K026, large rock in basket
13.46	52	36.61	-9	54.9255	60.6	Sample K027
13.49	52	36.61	-9	54.9255	60.6	Sample K028
13.59	52	36.64273	-9	54.91674	57.8	End of dive HD stopped

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 15/9/24
Dive: CE24010_ ROV 7
Location: Offshore Kerry
Scientists: Andy Wheeler / Manfredo



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K021	52°36.5781	9°54.8980	59.3	13:07	Likely from bedrock
B	K022	52°36.5781	9°54.8980	59.3	13:09	Likely from bedrock
C	K023	52°36.5781	9°54.8980	59.3	13:14	Likely from bedrock
D	K025	52°36.5792	9°54.9257	59.4	13:28	2 pieces
E	K024	52°36.5792	9°54.9257	59.4	13:26	Probably bedrock
F	K027	52°36.6100	9°54.9255	60.6	13:44	Large flat rock
G	K028	52°36.6100	9°54.9255	60.6	13:49	Large flat rock
H	**X**					NO SAMPLE
I	**X**					NO SAMPLE
J	K026	52°36.5792	9°54.9257	59.4	13:28	Large rock

CE24010-ROV7 Basket photo

CE24010-ROV7 Wet lab photo

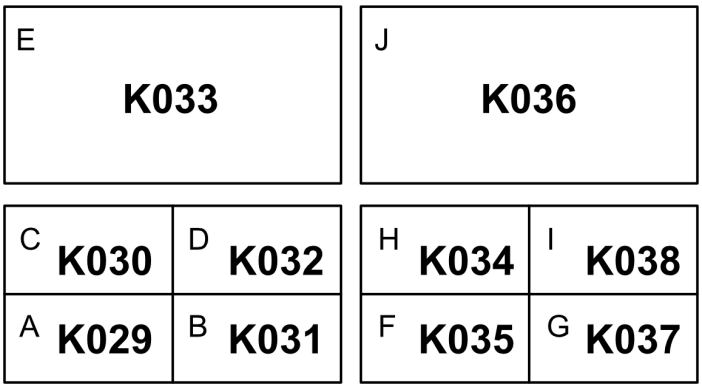
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV8 Scientists Andy Wheeler and Johnathan and Manfredo
Date: 15/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
15:02	52	33.8972	-9	57.4015	57.0	HD on, start dive heading NW
15:07	52	33.8972	-9	57.4015	57.0	K29 collected
15:19	52	33.8972	-9	57.4015	57.0	Collected 3 samples continuing N
15:23	52	33.9083	-9	57.4078	59.0	New location, K32 collected
15:27	52	33.9083	-9	57.4078	59.0	Heading N
15:30	52	33.9171	-9	57.4144	58.0	New location
15:35	52	33.9171	-9	57.4144	58.0	Heading N
15:40	52	33.9245	-9	57.4160	59.0	New location
15:47	52	33.9245	-9	57.4160	59.0	End dive, stop HD

ROCK SAMPLE LOG SHEET

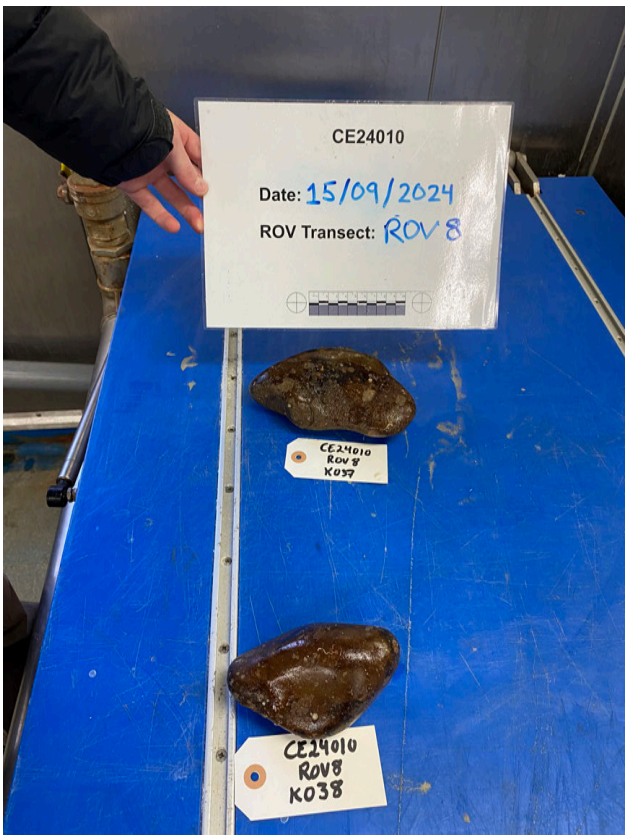
Survey: CE24010 PoroClim2
Date: 15/09/2024
Dive: CE24010_ ROV 8
Location: Offshore Kerry
Scientists: Andy Wheeler / Johnathan / Manfredo



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K029	52°33.8972	9°57.4015	57	15:07	Close to clear bed rock Small-med
B	K031	52°33.8927	9°57.4015	57	15:17	Close to clear bed rock Med-large
C	K030	52°33.8927	9°57.4015	57	15:10	Close to clear bed rock Med-large
D	K032	52°33.9083	9°57.4078	59	15:24	Close to clear bed rock Med-large
E	K033	52°33.9083	9°57.4078	59	15:26	Med-large
F	K035	52°33.9171	9°57.4114	58	15:35	Med + round
G	K037	52°33.9245	9°57.4160	59	15:43	Small-med
H	K034	52°33.9171	9°57.4114	58	15:33	Close to bedrock Long + flat
I	K038	52°33.9245	9°57.4160	59	15:45	Small
J	K036	52°33.9245	9°57.4160	59	15:41	Close to bedrock Large

CE24010-ROV8 Basket photo

CE24010-ROV8 Wet lab photo



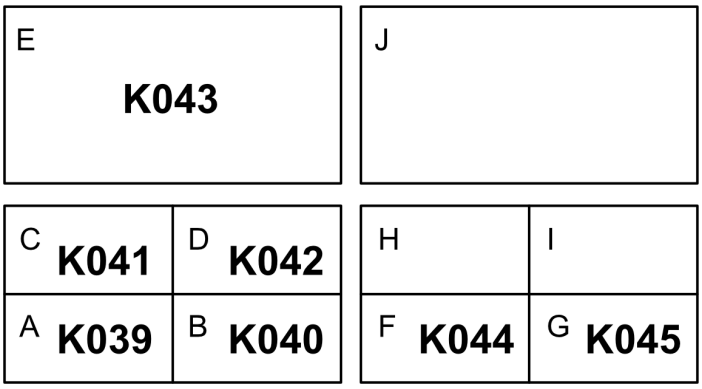
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV9 Scientists Andy Wheeler and John Hopper and Leon Berry-Walshe
Date: 15/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
18:41	52	34.2359	-10	28.7090	95.2	HD on, heading to the starting point
18:48	52	34.2658	-10	28.7390	93.2	At the starting point
19:02	52	34.3418	-10	28.8144	94.4	Hard ground
19:19	52	34.4183	-10	28.8868	94.7	Sample K39, Calcite vein?
19:24	52	34.4186	-10	28.8868	94.7	Sample K40, Bedrock?
19:40	52	34.4837	-10	24.9474	95.0	Sample K41, Bedrock?
19:41	52	34.4837	-10	24.9474	95.0	Sample K42, Bedrock?
19:44	52	34.4837	-10	24.9474	95.0	Sample K43, Bedrock?
19:45	52	34.4837	-10	24.9474	95.0	Course change: gone North for 10m to follow the bedrock
19:48	52	34.4931	-10	28.9520	95.0	Changing back to original course
20:05	52	34.5746	-10	29.0432	95.5	Stop for sampling
20:07	52	34.5746	-10	29.0432	95.5	Sample K44, Bedrock?
20:18	52	34.5759	-10	29.0420	95.4	Sample K45, Bedrock?
20:27	52	34.6334	-10	29.1003	93.7	HD stop, end of dive

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 15/09/2024
Dive: CE24010_ ROV 9
Location: Offshore Kerry
Scientists: Andy Wheeler / John Hopper / Leon Berry-Walshe

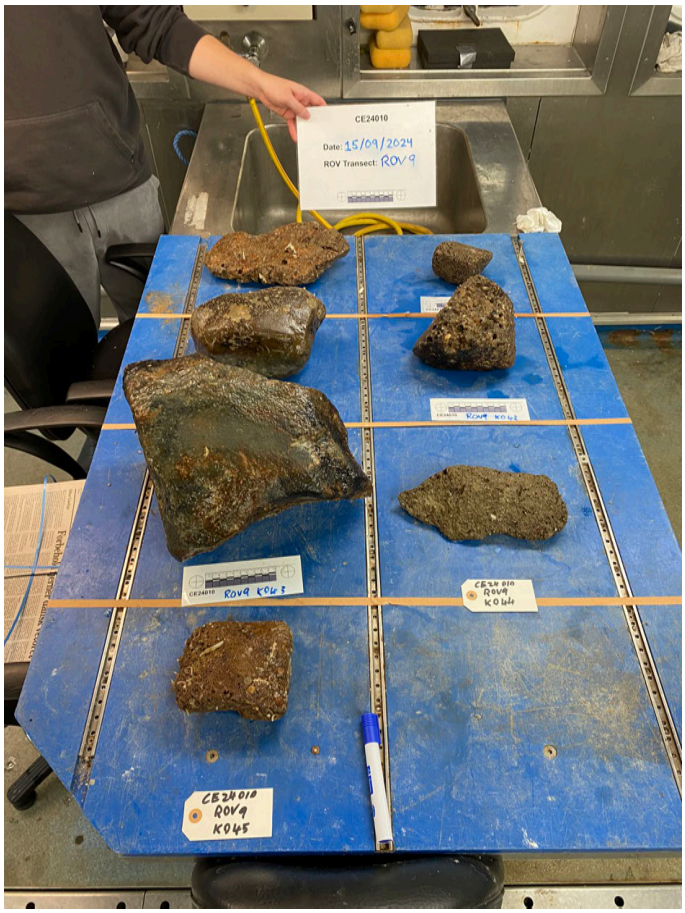


Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K039	52°34.41860	10°28.8869	96.6	19:20	Calcite vein?
B	K040	52°34.41859	10°28.8863	96.4	19:24	Bedrock?
C	K041	52°34.48381	10°28.9495	96.4	19:41	Bedrock?
D	K042	52°34.48381	10°28.9495	96.4	19:42	Bedrock?
E	K043	52°34.48381	10°28.9495	96.4	19:45	Bedrock?
F	K044	52°34.5746	10°29.0432	95.5	20:07	Bedrock?
G	K045	52°34.5746	10°29.0420	95.4	20:08	Bedrock? square
H						
I						
J						

CE24010-ROV9 Basket photo

No basket photos

CE24010-ROV9 Wet lab photo



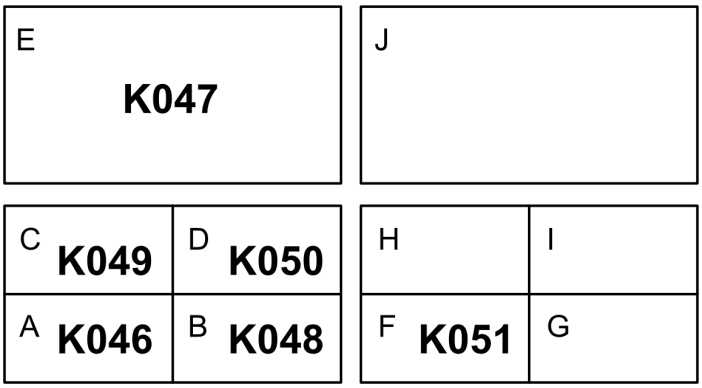
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV10 Scientists Manfredo
Date: 15-16/09/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
23:33	52	36.9711	-10	35.1455	102.0	Start ROV dive, HD on
23:52	52	36.9878	-10	35.2759	106.6	Sample 1 - K046, fragment of hard ground
23:58	52	36.9800	-10	35.3000	102.6	Sample 2 - K047, huge chunk into basket
0:06	52	36.9908	-10	35.3115	106.7	Sample 3 - BIG? - K048 - just drop stones?
0:12	52	36.9943	-10	35.3186	106.4	Sample 4 - K049 - farthest right from cluster
0:18	52	36.9943	-10	35.3186	106.4	Sample 5 - K050
0:20	52	36.9943	-10	35.3186	106.4	Sample 6 - K051
0:49	52	37.0423	-10	35.3887	106.8	End of ROV dive - on sea floor, HD off

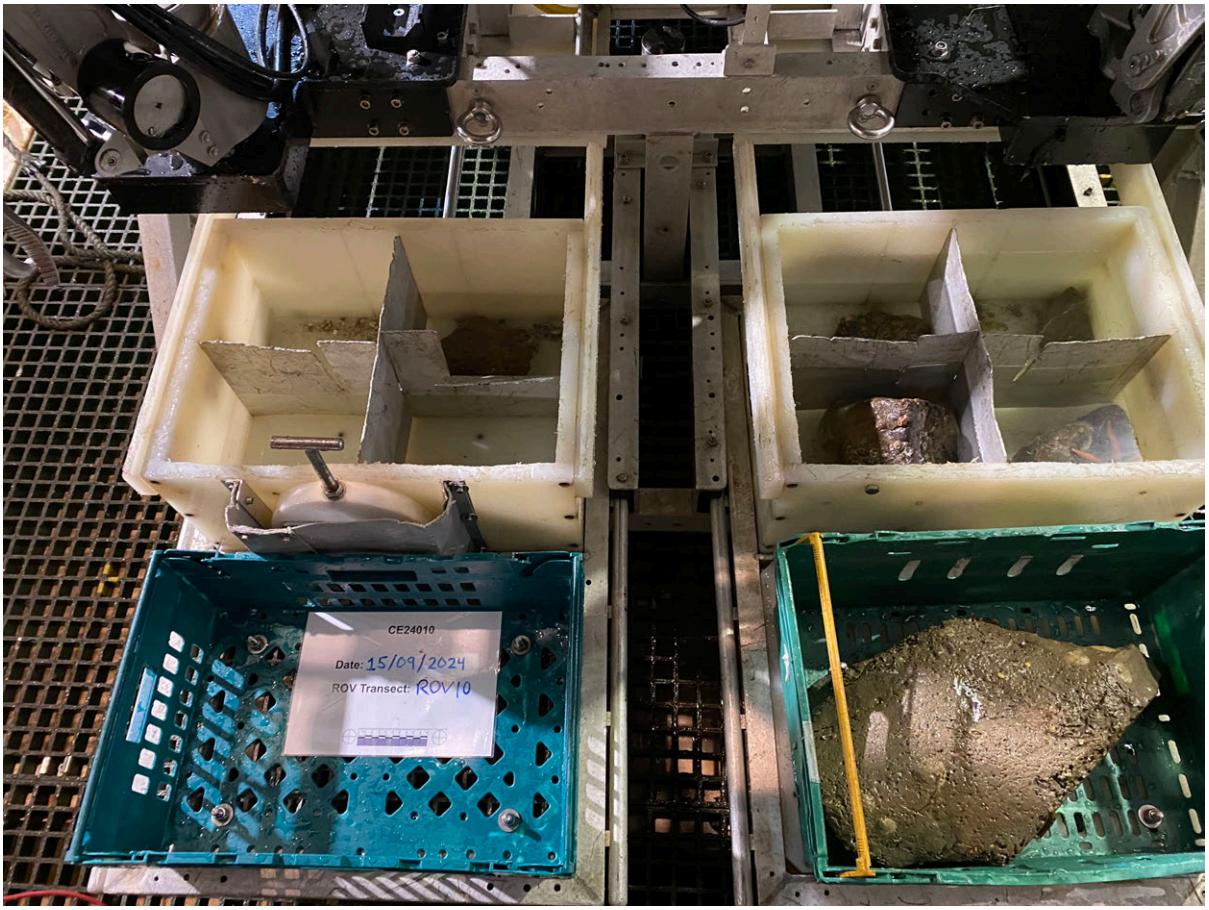
ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 15-16/09/2024
Dive: CE24010_ ROV 10
Location: Offshore Kerry
Scientists: Andy Wheeler / Manfredo



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K046	52°36.9879	10°35.2759	103.1	23:55 15/9	Small fragment of sea floor
B	K048	52°36.9908	10°35.3115	106.4	00:06 16/9	Drop stone potentially?
C	K049	52°36.9943	10°35.3186	106.4	00:12 16/9	One of a cluster found Likely bedrock
D	K050	52°36.9943	10°35.3186	106.4	00:18 16/9	One of a cluster found Likely bedrock
E	K047	52°36.9800	10°35.3000	103.1	23:58 15/9	Huge chunk, basket
F	K051	52°36.9943	10°35.3186	106.4	00:20 16/9	One of a cluster found Hard ground
G	**X**					**NO SAMPLE**
H	**X**					**NO SAMPLE**
I	**X**					**NO SAMPLE**
J	**X**					**NO SAMPLE**

CE24010-ROV10 Basket photo



CE24010-ROV10 Wet lab photo

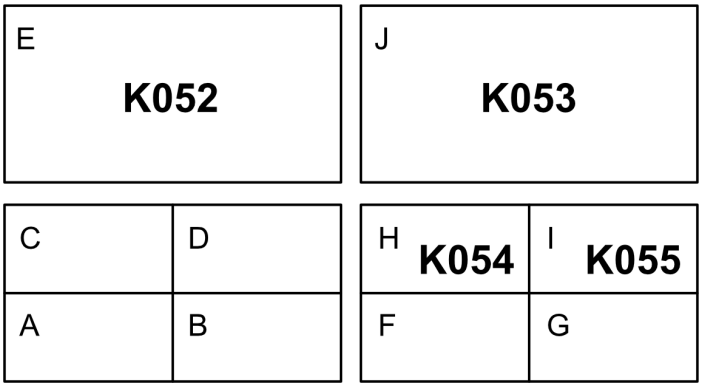
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV11 Scientists John and Jonathan
Date: 16/9/2024 Location: Offshore Kerry

Time	Lat Deg	Min	Long Deg	Min	Depth (m)	Observation
3:16	52	23.4356	-10	41.1082	104.0	Reached seabed, landed 375m east of J, heading W-NW
3:24	52	23.4367	-10	41.1530	103.0	HD live
3:36	52	23.4711	-10	41.2664	101.0	Mostly hard ground and sediments, continuing NW
3:52	52	23.5184	-10	41.4382	103.0	Continue SW along SW-NE trending feature
4:08	52	23.4802	-10	41.5024	102.0	Contiinuing NW to investigate another feature
4:20	52	23.5203	-10	41.5631	101.0	Picking up sample K052, doesn't look like hard ground but is isolated
4:33	52	23.5489	-10	41.5969	102.0	Picking up sample K053 and K054 at pile of cobbles and stones
4:38	52	23.5489	-10	41.5969	102.0	Picking up sample K055 at pile of cobbles and stones
4:41	52	23.5542	-10	41.5989	102.0	End of dive, HD stop

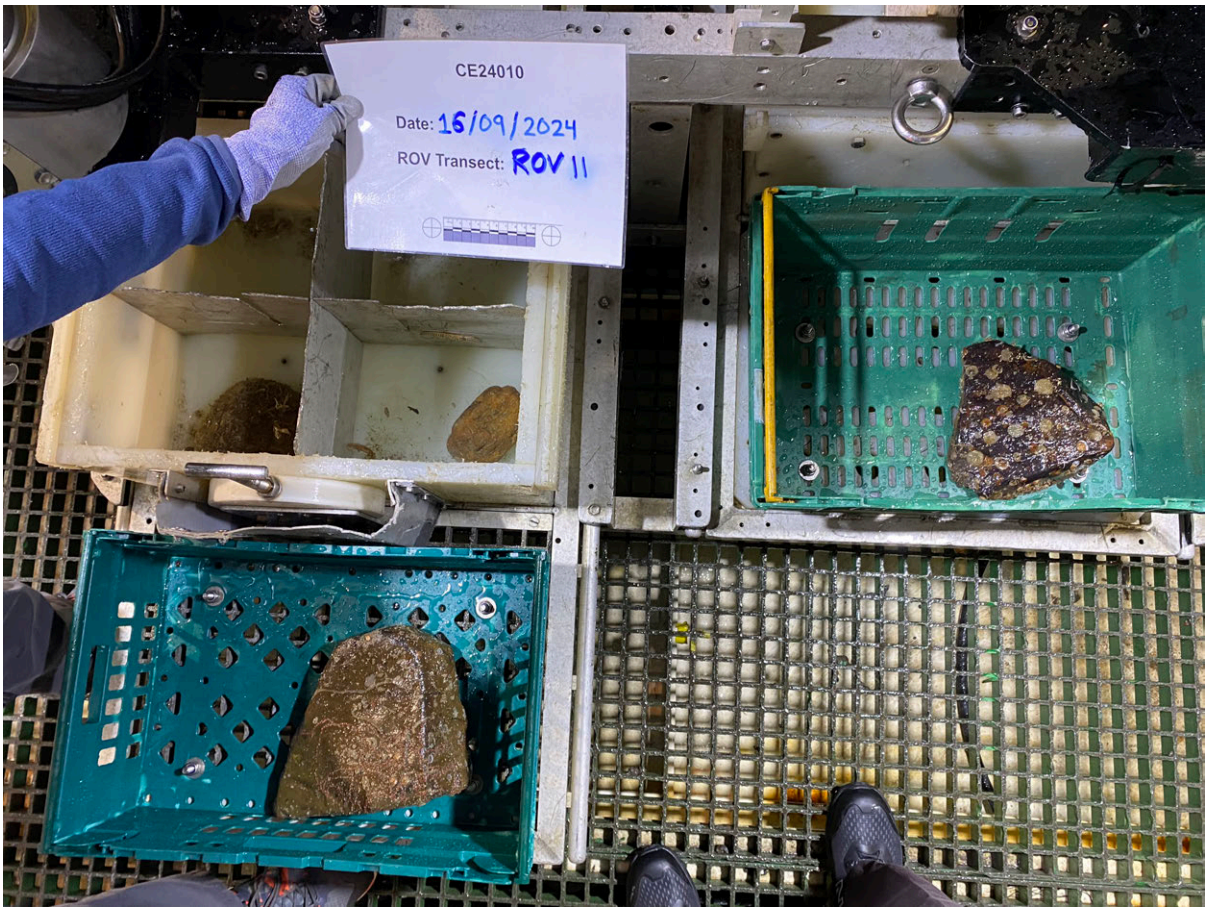
ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 16/09/2024
Dive: CE24010_ ROV 11
Location: Offshore Kerry
Scientists: John / Jonathan / Rebekka



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	**X**					**NO SAMPLE**
B	**X**					**NO SAMPLE**
C	**X**					**NO SAMPLE**
D	**X**					**NO SAMPLE**
E	K052	52°23.5215	10°41.5644	104.9	04:20	Isolated rock?
F	**X**					**NO SAMPLE**
G	**X**					**NO SAMPLE**
H	K054	52°23.5452	10°41.5580	105.1	04:36	
I	K055	52°23.2355	10°41.5989	105.0	04:39	
J	K053	52°23.5452	10°41.5980	105.1	04:35	

CE24010-ROV11 Basket photo



CE24010-ROV11 Wet lab photo

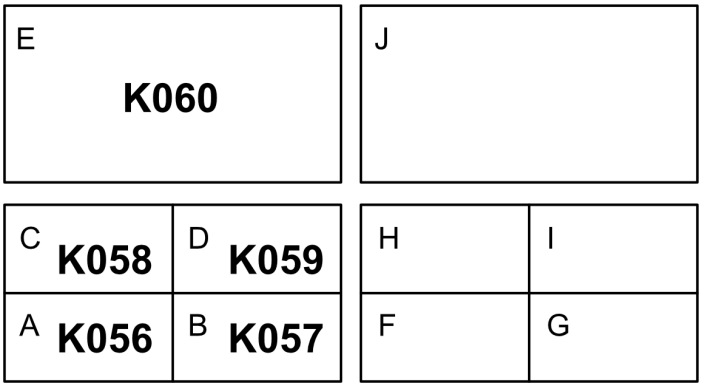
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV12 Scientists John and Rebekka
Date: 16/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
6:18	52	21.8009	-10	53.3828	121.2	Reached the bottom
6:19	52	21.8009	-10	53.3828	123.4	HD on, heading North-West
6:26	52	21.8179	-10	53.4064	123.1	Heading North-East
6:33	52	21.8339	-10	53.4043	123.6	Heading North
6:38	52	21.8381	-10	53.4026	123.6	Sample K056
6:40	52	21.8392	-10	53.4022	123.7	Sample K057, heading North
6:49	52	21.8675	-10	53.4016	123.7	Sample K058
6:50	52	21.8675	-10	53.4016	123.7	Sample K059
6:53	52	21.8623	-10	53.4012	123.7	Sample K060, heading North
7:01	52	21.8916	-10	53.9972	123.3	End of dive, HD off

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 16/09/2024
Dive: CE24010_ ROV 12
Location: Offshore Kerry
Scientists: John Hopper / Rebekka



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K056	52°21.8396	10°53.4025	126.4	06:38	IRD?
B	K057	52°21.8407	10°53.4020	126.5	06:39	Bedrock?
C	K058	52°21.8675	10°53.4006	125.9	06:49	Bedrock?
D	K059	52°21.8675	10°53.4006	125.9	06:50	Bedrock?
E	K060	52°21.8675	10°53.4006	125.9	06:51	Bedrock?
F	**X**					**NO SAMPLE**
G	**X**					**NO SAMPLE**
H	**X**					**NO SAMPLE**
I	**X**					**NO SAMPLE**
J	**X**					**NO SAMPLE**

CE24010-ROV12 Basket photo

No basket photos

CE24010-ROV12 Wet lab photo

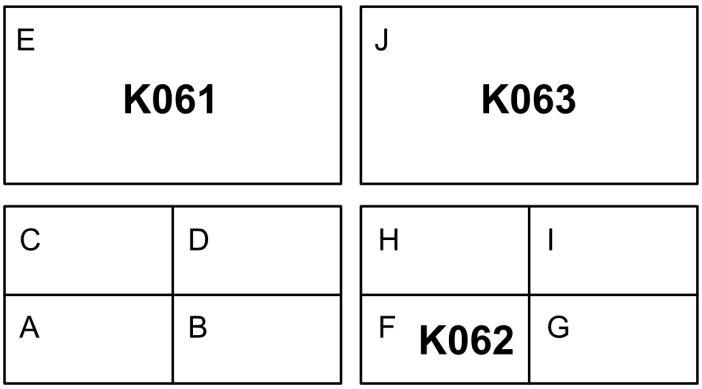
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV13 Scientists Andy and Leon
Date: 16/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
10:09	52	03.5792	-10	45.8729	60.5	Reached the bottom, HD on
10:26	52	03.5792	-10	45.8729	60.5	Heading South-West
10:32	52	03.5681	-10	45.8887	72.1	Conglomerates at seabed, devonian?
10:48	52	03.5550	-10	45.9471	55.8	Heading South
10:55	52	03.5450	-10	45.9707	62.2	Facing South moving Westward, Constant bedrock, no loose stones
10:56	52	03.5453	-10	45.9701	61.4	Heading South
10:58	52	03.5458	-10	45.9703	61.8	Heading West
11:15	52	03.5442	-10	46.1012	92.5	Stop for sampling
11:21	52	03.5442	-10	46.1012	92.5	Sample K061
11:24	52	03.5442	-10	46.1012	92.5	Sample K062
11:26	52	03.5442	-10	46.1012	92.5	Sample K063
11:26	52	03.5442	-10	46.1012	92.5	Exploring area just sampled further
11:29	52	03.5453	-10	46.1099	92.2	Heading up slope from where rocks seemingly fell from
11:31	52	03.5545	-10	46.1166	87.2	End of dive, HD stopped

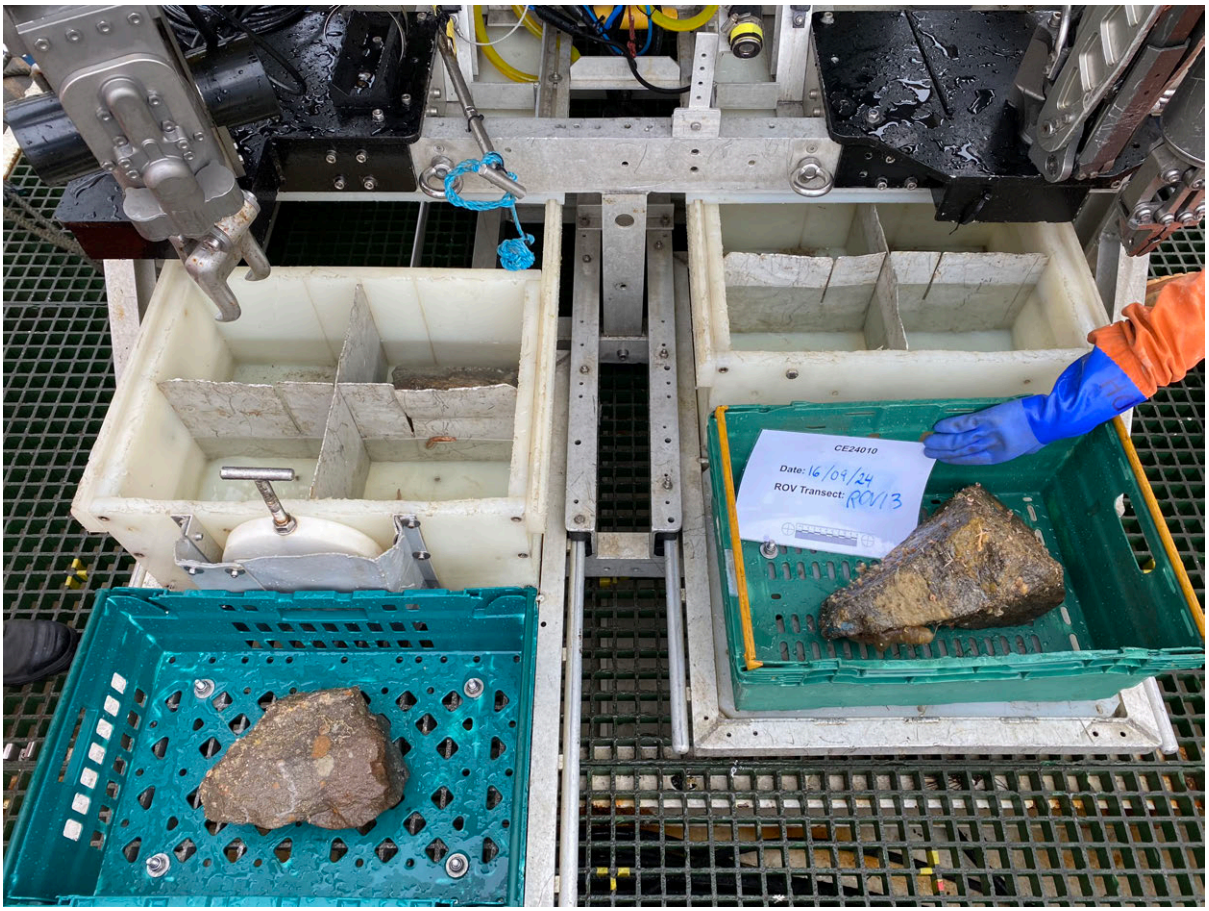
ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 16/09/2024
Dive: CE24010_ ROV 13
Location: Offshore Kerry
Scientists: Andy Wheeler / Leon



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	**X**					**NO SAMPLE**
B	**X**					**NO SAMPLE**
C	**X**					**NO SAMPLE**
D	**X**					**NO SAMPLE**
E	K061	52°03.5442	10°46.1012	92.5	11:21	Bedrock?
F	K062	52°03.5442	10°46.1012	92.5	11:24	Bedrock?
G	**X**					**NO SAMPLE**
H	**X**					**NO SAMPLE**
I	**X**					**NO SAMPLE**
J	K063	52°03.5442	10°46.1012	92.5	11:26	Bedrock?

CE24010-ROV13 Basket photo



CE24010-ROV13 Wet lab photo

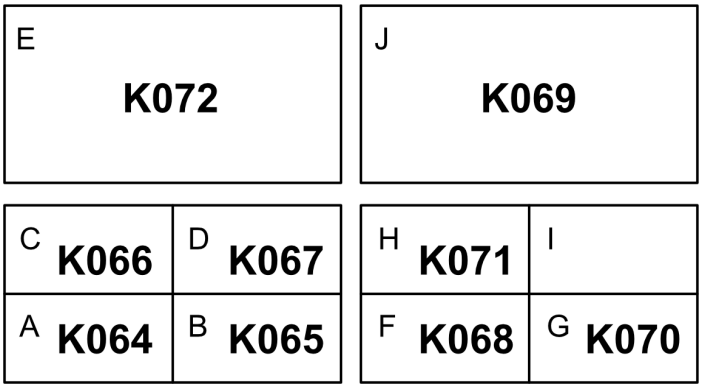
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV14 Scientists Ibrahim and Manfredo
Date: 16/9/2024 Location: Offshore Kerry

Time	Lat Deg	Min	Long Deg	Min	Depth (m)	Observation
13:11	52	0.7925	-10	43.4445	80.7	On seafloor looking for samples, HD on
13:27	52	0.7934	-10	43.4679	81.6	Sample K064
13:29	52	0.7934	-10	43.4679	81.6	Sample K065
13:31	52	0.7934	-10	43.4679	81.6	Sample K066, heading NW
13:38	52	0.7988	-10	43.4754	79.1	Sample K067
13:43	52	0.7988	-10	43.4754	79.1	Sample K068
13:43	52	0.7988	-10	43.4754	79.1	Sample K069, heading NW
13:58	52	0.8226	-10	43.5200	71.3	Sample K070
14:03	52	0.8226	-10	43.5200	71.3	Sample K071
14:11	52	0.8226	-10	43.5200	71.3	Sample K072, HD off

ROCK SAMPLE LOG SHEET

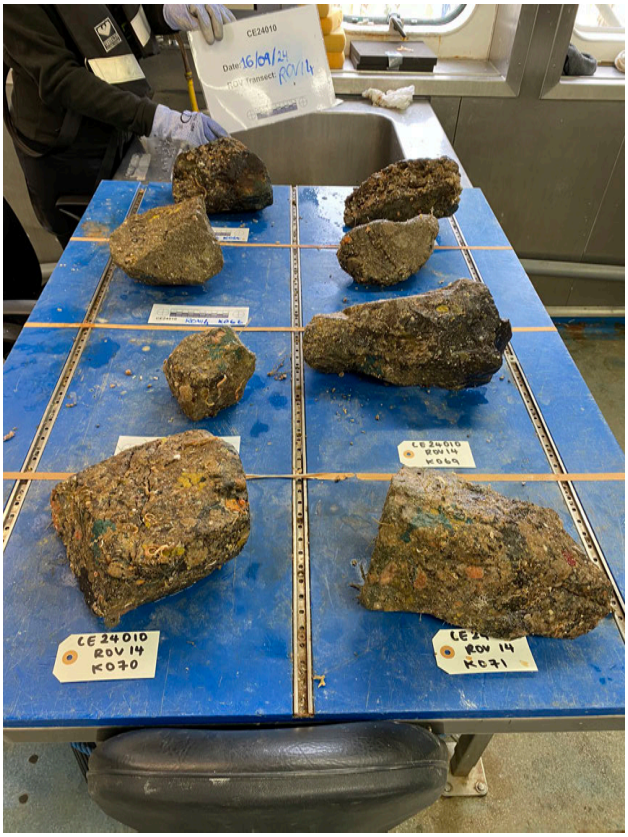
Survey: CE24010 PoroClim2
Date: 16/09/2024
Dive: CE24010_ ROV 14
Location: Offshore Kerry
Scientists: Andy Wheeler / Ibrahim / Manfredo

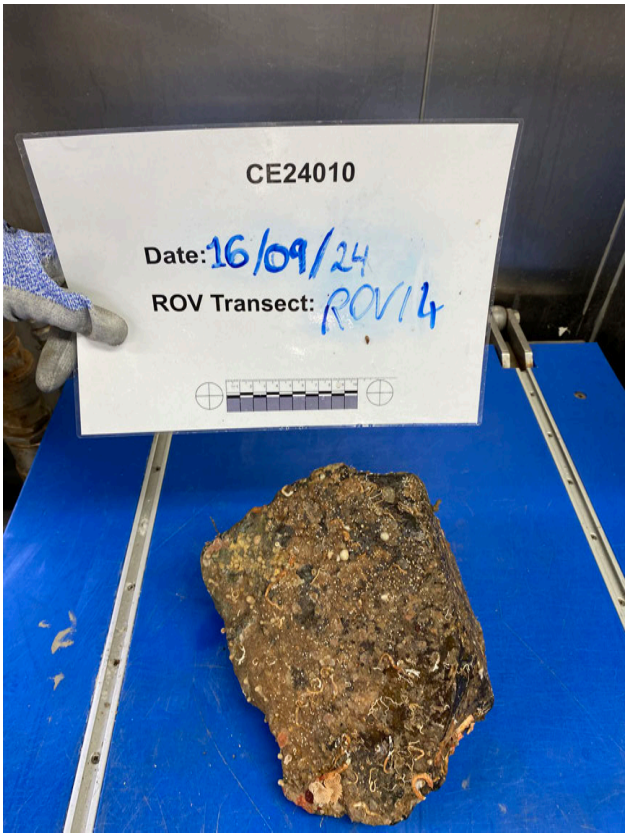


Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K064	52°00.7934	10°43.4679	81.6	13:27	
B	K065	52°00.7934	10°43.4679	81.6	13:29	
C	K066	52°00.7934	10°43.4679	81.6	13:31	
D	K067	52°00.7988	10°43.4794	79.1	13:38	
E	K072	52°00.8226	10°43.4970	79.3	14:11	
F	K068	52°00.7988	10°43.4794	79.1	13:43	
G	K070	52°00.8226	10°43.5200	71.3	13:58	
H	K071	52°00.8226	10°43.5200	71.3	14:03	
I	**X**					**NO SAMPLE**
J	K069	52°00.7988	10°43.4794	79.1	13:44	

CE24010-ROV14 Basket photo

CE24010-ROV14 Wet lab photo





ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV15 Scientists John and Jonathon
Date: 16/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
16:00	52	1.3718	-10	25.9531	64.0	HD on, heading southwest
16:12	52	1.3447	-10	25.9886	66.0	Sediments and isolated rocks so far, heading SW
16:31	52	1.2959	-10	26.0918	67.0	Turning North, seabed still the same
16:50	52	1.3744	-10	26.0543	64.0	Following NE trending feature lost c. 10 minutes, all sediments so far
16:56	52	1.3950	-10	26.0110	64.0	Heading north again
17:03	52	1.4309	-10	26.0084	64.0	HD stop, end dive, coming up to the surface

ROV DIVE 15

No samples because no bedrock found.

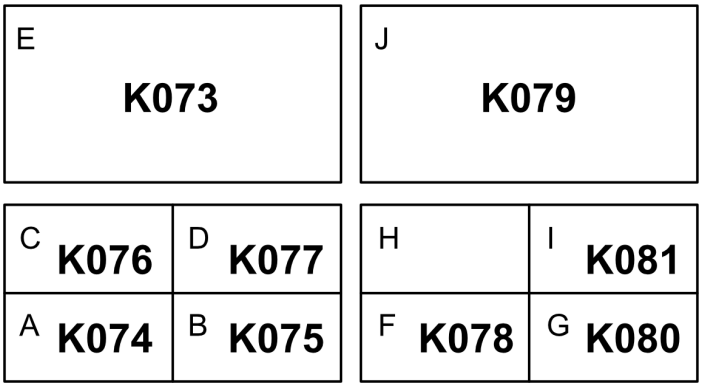
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV16 Scientists John and Rebekka
Date: 16/09/2024 Location: Offshore Kerry

Time	Lat Deg	Min	Long Deg	Min	Depth (m)	Observation
18:08	52	0.5594	-10	17.2791	46.9	HD on, heading SW
18:16	52	0.5542	-10	17.3054	49.5	Sample K073
18:19	52	0.5542	-10	17.3054	49.5	Sample K074
18:21	52	0.5542	-10	17.3054	49.5	Sample K075
18:27	52	0.5474	-10	17.3323	49.7	Sample K076
18:28	52	0.5474	-10	17.3323	49.6	Sample K077
18:30	52	0.5474	-10	17.3323	49.6	Sample K078, heading South
18:37	52	0.5396	-10	17.3439	50.1	Sample K079
18:38	52	0.5396	-10	17.3437	50.1	Sample K080
18:39	52	0.5398	-10	17.3441	50.1	Sample K081
18:40	52	0.53978	-10	17.3439	50.1	Stop HD

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 16/09/2024
Dive: CE24010_ ROV 16
Location: Offshore Kerry
Scientists: John Hopper / Rebekka



Box	Sample	Lat	Long	Depth m	Time	Comment
A	K073	52°0.55435	10°17.30729	51	18:18	
B	K074	52°0.55431	10°17.30735	51	18:19	
C	K075	52°0.55431	10°17.30735	51	18:20	
D	K076	52°0.54738	10°17.33411	51	18:27	
E	K077	52°0.54753	10°17.33422	51	18:28	
F	**K078**	**52°0.547**	**10°17.33422**	**51**	**18:31**	
G	**K079**	**52°0.58342**	**10°17.34441**	**51.7**	**18:37**	
H	**K080**	**52°0.58342**	**10°17.34441**	**51.7**	**18:38**	
I	**K081**	**52°0.58342**	**10°17.34441**	**51.7**	**18:39**	
J	**X**					NO SAMPLE

CE24010-ROV16 Basket photo

CE24010-ROV16 Wet lab photo

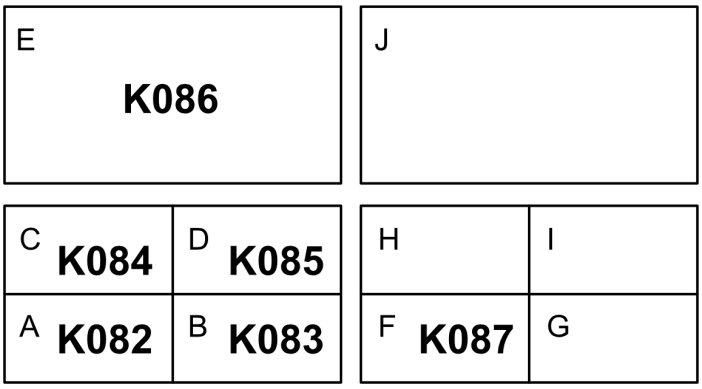
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV17 Scientists Andy / Leon
Date: 16/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
21:12	52	10.1081	-10	35.5309	78.8	Start of dive. HD on
21:14	52	10.1081	-10	35.5309	78.8	Heading North.
21:15	52	10.1081	-10	35.5321	81	Hard ground.
21:17	52	10.1109	-10	35.529	81.1	Heading 50 m North.
21:22	52	10.1286	-10	35.5196	88	Bottom of slope, sand and sorted shell fragments, no stones, sand waves contouring bottom o
21:33	52	10.1789	-10	35.514	85	Following crack in hard ground, slightly West of North.
21:36	52	10.1816	-10	35.5147	85.9	Sample K082.
21:39	52	10.1816	-10	35.5147	86	Sample K083, next to K082.
21:44	52	10.182	-10	35.5123	83.9	Sample K084.
21:47	52	10.1917	-10	35.5186	81.2	Continuing NW.
21:51	52	10.203	-10	35.5261	80.9	Fissure being followed in hard ground notably deep.
21:53	52	10.2095	-10	35.5327	82.7	Move to new fissure on portside.
21:56	52	10.2182	-10	35.5367	82.7	Sample K085.
21:59	52	10.2182	-10	35.5367	82.7	Sample K086.
22:00	52	10.2182	-10	35.5367	82.7	Sample K087.
22:01	52	10.2182	-10	35.5367	82.7	Resume heading NW, sediment very thick with gulleys, no bedrock, are stones from bedrock?
22:12	52	10.2539	-10	35.5608	82.6	Calcite veins (?)through hard ground.
22:17	52	10.2651	-10	35.5615	81.7	End of dive. HD stop. Andy not convinced stones acquired are bedrock. Hard ground suggests

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 16/09/2024
Dive: CE24010_ ROV_17
Location: Offshore Kerry
Scientists: Andy / Leon

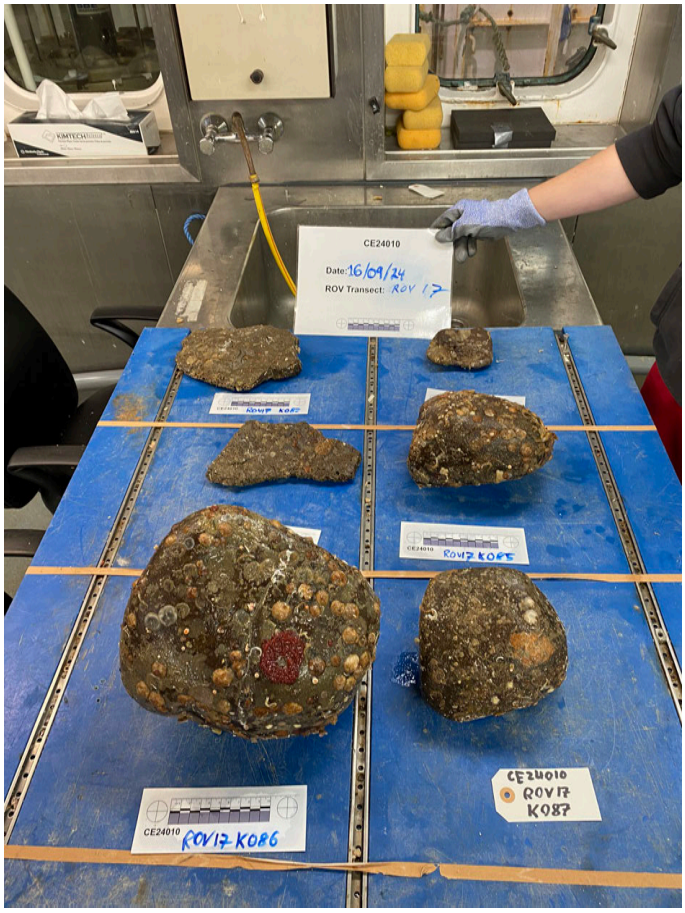


Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K082	52°10.1816	10°35.5147	85.9	21:38	Slab
B	K083	52°10.1816	10°35.5147	85.9	21:39	Beside sample K082
C	K084	52°10.1820	10°35.5123	86.0	21:44	
D	K085	52°10.2182	10°35.5367	82.7	21:56	
E	K086	52°10.2182	10°35.5367	82.7	21:59	
F	K087	52°10.2182	10°35.5367	82.7	22:00	
G	**X**					**NO SAMPLE**
H	**X**					**NO SAMPLE**
I	**X**					**NO SAMPLE**
J	**X**					**NO SAMPLE**

CE24010-ROV17 Basket photo

No basket photo

CE24010-ROV17 Wet lab photo



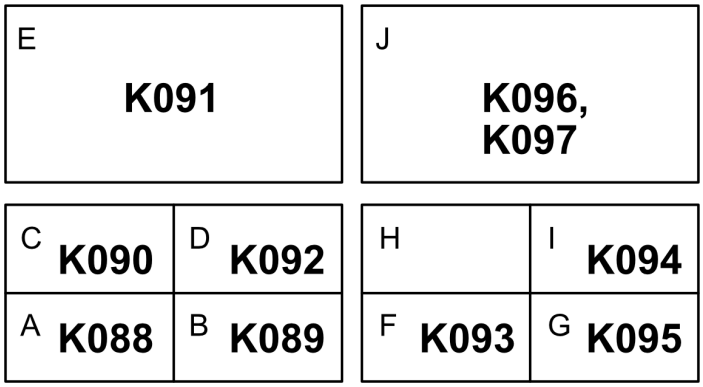
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV18 Scientists Manfredo/Ibrahim
Date: 16-17/09/24 Location: Offshore Kerry

Time UTC	Lat Deg	Min	Long Deg	Min	Depth (m)	Observation
23.52	52	18.8282	-10	35.5753	97.3	On seafloor
23.54	52	18.8282	-10	35.5253	97.3	HD camera on
0.19	52	18.8572	-10	35.7011	97.7	Sample K088, could be a dropstone?
0.27	52	18.8622	-10	35.7199	96.9	Sample K089, hardground? Fragmented hardground?
0.29	52	18.8622	-10	35.7199	96.9	Sample K090, hardground
0.47	52	18.8773	-10	35.7579	98.1	Sample K091
0.48	52	18.8773	-10	35.7579	98.1	Sample K092
0.51	52	18.8773	-10	35.7579	98.1	Sample K093
1.16	52	18.9497	-10	35.8916	97.6	Sample K094
1.24	52	18.9567	-10	35.9021	97.1	Sample K095
1.39	52	18.9902	-10	35.9289	91.4	Sample K096 & Sample K097
2.13	52	19.1136	-10	36.1507	93.2	End of dive, HD off

ROCK SAMPLE LOG SHEET

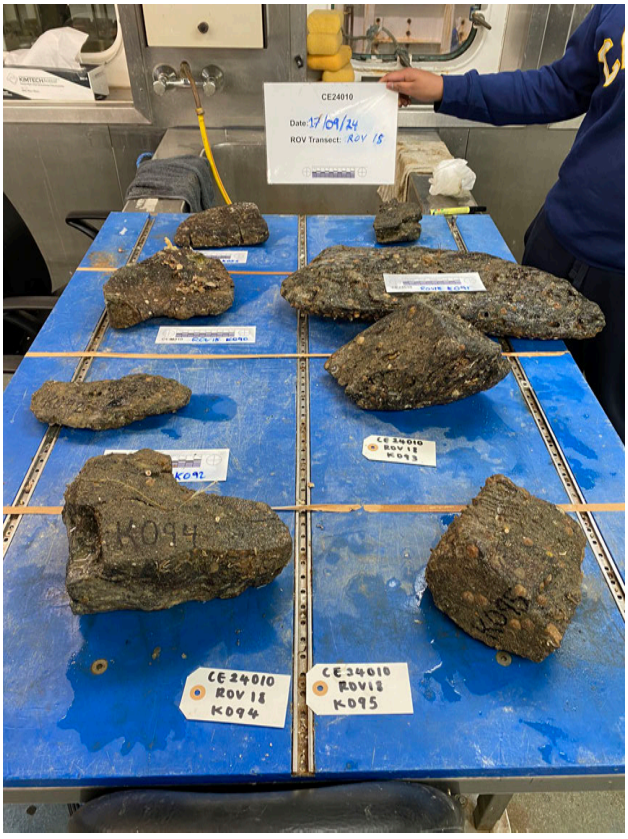
Survey: CE24010 PoroClim2
Date: 16-17/09/2024
Dive: CE24010_ ROV_18
Location: Offshore Kerry
Scientists: Manfredo / Ibrahim



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K088	52° 18.8572	10° 35.7011	97.7	0.19	Could be dropstone?
B	K089	52° 18.8622	10° 35.7199	96.9	0.28	Hard ground?
C	K090	52° 18.8622	10° 35.7199	96.9	0.29	Hard ground?
D	K092	52° 18.8773	10° 35.7579	98.1	0.48	
E	K091	52° 18.8773	10° 35.7579	98.1	0.49	
F	K093	52° 18.8773	10° 35.7579	98.1	0.51	
G	K095	52° 18.9567	10° 35.9021	97.1	1.24	
H	**X**					**NO SAMPLE**
I	K094	52° 18.9497	10° 35.8916	97.6	1.16	
J	K096 K097	52° 18.9902	10° 35.9289	91.4	1.39	K096 (small, rounded) K097 (big)

CE24010-ROV18 Basket photo

CE24010-ROV18 Wet lab photo



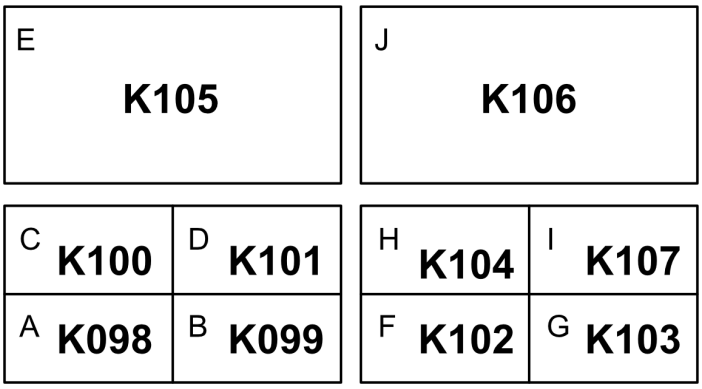
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV19 Scientists John/ Jonathon
Date: 17/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
3:57	52	20.2553	-10	21.5371	89	HD camera on, start of dive
4:02	52	20.2594	-10	21.5325	89	Sampling at clear bedrock
4:08	52	20.2594	-10	21.5325	89	Bedrock is dark colour
4:15	52	20.2572	-10	21.5375	90	Heading towards transect
5:03	52	20.5647	-10	21.8311	83	Going along transect - two lithologies so far? Halfway done
5:15	52	20.6158	-10	21.8107	84	Sampling on mid-transect ridge
5:33	52	20.6562	-10	21.8987	85	Heading to end of transect to investigate 3rd lithology
5:55	52	20.7893	-10	22.0237	82	Arrive sampling now
6:04	52	20.792	-10	22.0242	81	Basket full. HD stop, end of dive

ROCK SAMPLE LOG SHEET

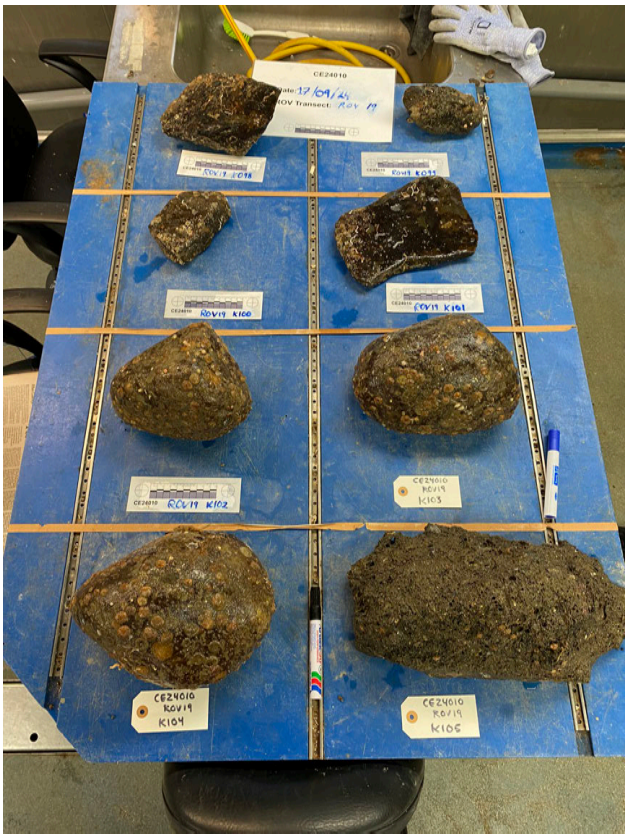
Survey: CE24010 PoroClim2
Date: 17/09/2024
Dive: CE24010_ ROV_19
Location: Offshore Kerry
Scientists: John / Jonothan



Box	Sample	Lat	Long	Depth m	Time	Comment
A	K098	52o20.25561	10o21.53465	91.9	3.59	Possibly 2 lithologies, lighter and darker ones
B	K099	52o20.25561	10o21.53465	91.9	4.04	Possibly 2 lithologies, lighter and darker ones
C	K100	52o20.25561	10o21.53465	91.9	4.08	Possibly 2 lithologies, lighter and darker ones
D	K101	52o20.25529	10o21.53811	91.5	4.11	Possibly 2 lithologies, lighter and darker ones
E	K105	52o20.79036	10o22.02321	83.6	5.56	
F	K102	52o20.61613	10o21.81213	86.0	5.17	
G	K103	52o20.61613	10o21.81213	86.0	5.18	
H	K104	52o20.61613	10o21.81213	86.0	5.19	
I	K107	52o20.79270	10o22.02262	83.5	06.02	
J	K106	52o20.79270	10o22.02262	83.5	05.59	

CE24010-ROV19 Basket photo

CE24010-ROV19 Wet lab photo



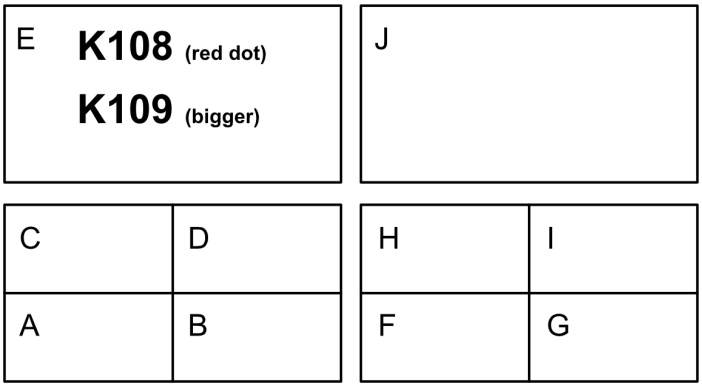
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV20 Scientists Andy / Leon
Date: 17/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
7:39	52	25.3543	-10	14.6364	61.50	Reached bottom
7:42	52	25.3526	-10	14.6267	61.00	HD on
7:43	52	25.3526	-10	14.6267	61.00	Heading South
7:50	52	25.3662	-10	14.6277	57.80	Eroded sediment, no bedrock, sediment thickness > 0.5m, hole all the way through, continue south
7:56	52	25.3172	-10	14.6267	56.00	Turning East
7:59	52	25.3076	-10	14.5816	54.00	Came up 40m off seabed, trying to return to seabed, lost seabed visibility
8:02	52	25.3036	-10	14.5480	55.90	Bottom visible again, resume search to the East, sandy base
8:08	52	25.3092	-10	14.5262	52.90	ROV to surface, HD left on
8:11	52	25.3110	-10	14.5493	56.20	Back on seabed, heading East
8:16	52	25.3070	-10	14.5191	55.80	Samples K108 and K109
8:22	52	25.3070	-10	14.5191	55.80	Continue heading East
8:26	52	25.3047	-10	14.4816	59.90	Big ridge of rounded cobbles, headed over it, morraine?
8:32	52	25.3021	-10	14.4313	54.00	Turn to SE to investigate apparent ridge on sonar
8:38	52	25.2927	-10	14.4300	55.50	HD off, End of dive

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 17/09/2024
Dive: CE24010_ ROV_20
Location: Offshore Kerry
Scientists: Andy / Leon



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A						
B						
C						
D						
E	K108 K109	52°25.3070	10°14.5191	55.8	08:20	No bedrock, same place, May not be in situ
F						
G						
H						
I						
J						

CE24010-ROV20 Basket photo

CE24010-ROV20 Wet lab photo

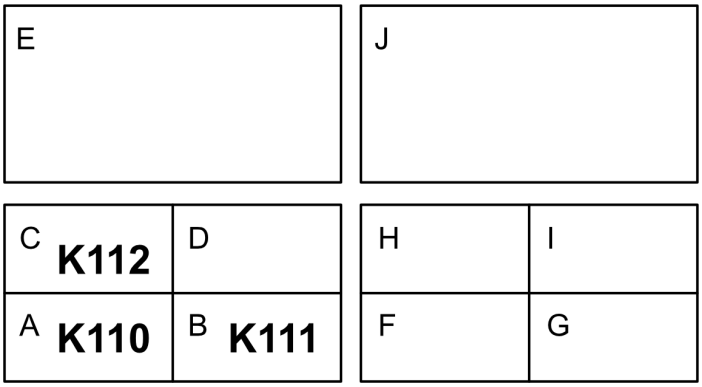
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV21 Scientists Andy / Leon
Date: 17/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
10:15	52	28.1056	-10	04.4268	48.7	Reached bottom
10:17	52	28.1054	-10	04.4276	48.1	Heading NE, towards middle of target, Hard ground underneath
10:20	52	28.0950	-10	04.3980	49.7	HD on, Hard ground underneath
10:28	52	28.1124	-10	04.3657	48.2	Headed slightly port to where sonar suggests rougher terrain
10:33	52	28.1141	-10	04.3505	50.1	Landed for sampling, 2 types of stone, no beedrock visible, not sure where they came from, sea bed just hard ground,sampling anyways
10:36	52	28.1141	-10	04.3505	50.1	Sample K110, Sandstone?
10:42	52	28.1141	-10	04.3505	50.1	Sample K111, Limestone?
10:53	52	28.1138	-10	04.3481	50.6	Sample K112, 3 rock types, type 3
10:56	52	28.1137	-10	04.3479	49.3	Heading S-SE
11:06	52	28.0793	-10	04.3297	48.8	continuing S-SE toward Kerry Head Shoal (~200m)
11:08	52	28.0651	-10	04.3207	48.7	Rippled flat sand with sorted gravels in the troughs, then back on hard ground
11:14	52	28.0281	-10	04.2985	48.7	Mixed sand and hard grounds, very flat
11:18	52	28.0142	-10	04.2881	44.4	Headin up Kerry Head Shoal on hard ground
11:21	52	27.9960	-10	04.2748	37.4	Hole/cave structure showing soft sediment for at least a metre under hard ground
11:26	52	27.9705	-10	04.2625	29.6	End of dive,HD stop, rapidly shallowing seabed, all hard grounds no bed rock

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 17/09/2024
Dive: CE24010_ ROV21
Location: Offshore Kerry
Scientists: Andy / Leon



Box	Sample	Lat (N)	Long (W)	Depth m	Time	Comment
A	K110	52°28.1141	10°04.3505	50.1	10:36	On hard ground, not sure if related to bedrock, sandstone?
B	K111	52°20.1141	10°04.3505	50.1	10:42	Limestone?
C	K112	52°20.1138	10°04.3481	50.6	10:53	3rd rock type in area Black stone?
D	**X**					**NO SAMPLE**
E	**X**					**NO SAMPLE**
F	**X**					**NO SAMPLE**
G	**X**					**NO SAMPLE**
H	**X**					**NO SAMPLE**
I	**X**					**NO SAMPLE**
J	**X**					**NO SAMPLE**

CE24010-ROV21 Basket photo

CE24010-ROV21 Wet lab photo

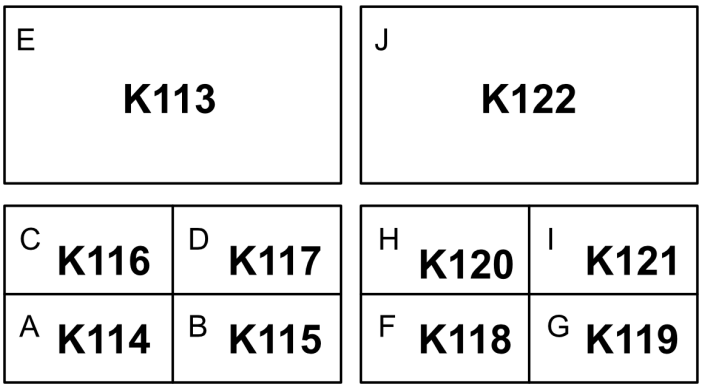
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV22 Scientists Manfredo / Ibrahim
Date: 17/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
13:19	52	33.5864	-9	58.0011	56.0	ROV on deafloor, HD on
13:23	52	33.5909	-9	58.0089	55.0	Sample K113
13:24	52	33.5909	-9	58.0089	55.0	Sample K114
13:32	52	33.6071	-9	57.9984	56.2	Sample K115
13:34	52	33.6071	-9	57.9984	56.2	Sample K116
13:40	52	33.6137	-9	57.9993	56.8	Sample K117
13:47	52	33.6137	-9	57.9993	56.8	Sample K118
13:55	52	33.6176	-9	58.0035	57.0	Sample K119
14:03	52	33.6427	-9	58.0108	57.0	Sample K120
14:05	52	33.6427	-9	58.0108	57.0	Sample K121
14:14	52	33.6337	-9	58.0625	57.0	Sample K122, HD off

ROCK SAMPLE LOG SHEET

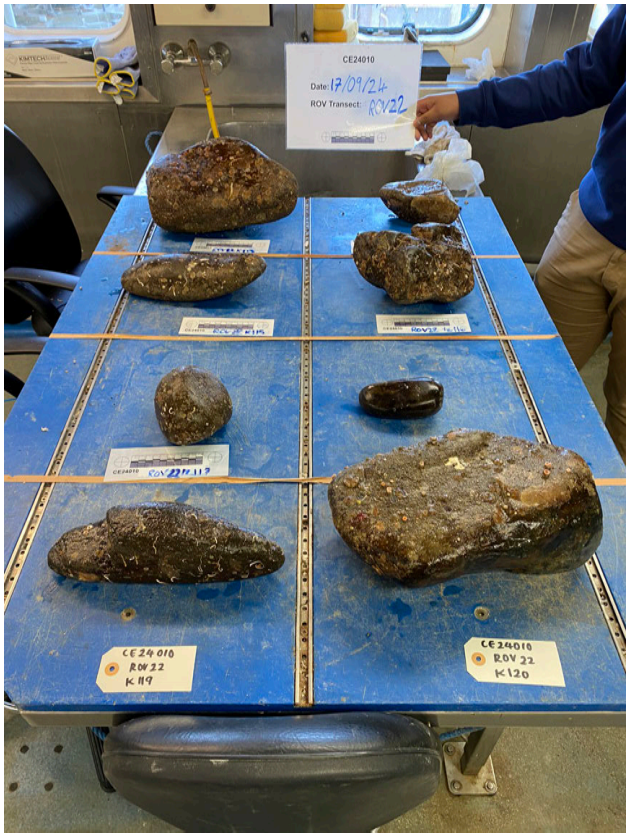
Survey: CE24010 PoroClim2
Date: 17/09/2024
Dive: CE24010_ ROV_22
Location: Offshore Kerry
Scientists: Andy / Manfredo / Ibrahim



	Sample	Lat	Long	Depth m	Time	Comment
A	K114	52°33.5909	9°58.0089	55.0	13:24	
B	K115	52°33.6071	9°57.9987	56.2	13:32	
C	K116	52°33.6071	9°57.9987	56.2	13:34	
D	K117	52°33.6137	9°57.9993	56.8	13:40	
E	K113	52°33.5909	9°58.0089	55.0	13:23	
F	K118	52°33.6137	9°57.9993	56.8	13:47	
G	K119	52°33.6176	9°58.0035	57.0	13:55	
H	K120	52°33.6427	9°58.0108	57.0	14:03	
I	K121	52°33.3427	9°58.0108	57.0	14:05	
J	K122	52°33.6337	9°58.0625	57.0	14:14	

CE24010-ROV22 Basket photo

CE24010-ROV22 Wet lab photo



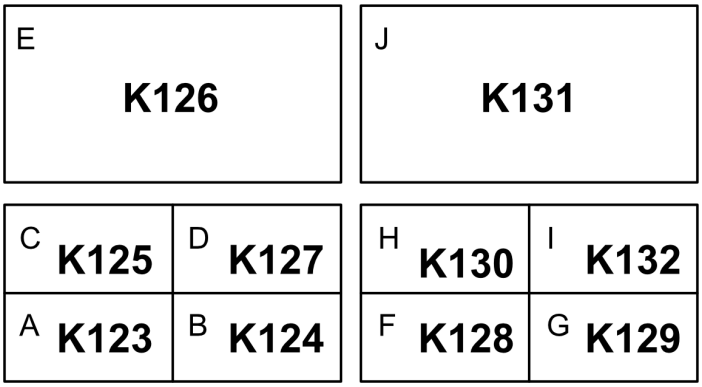
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV23 Scientists John / Rebekka
Date: 17/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
15:41	52	34.2698	-9	55.9744	50.9	HD on, heading NW
15:48	52	34.2880	-9	56.0003	53.2	Sample K123 (slight discrepancy from rock sample log, take this sheet as correct coordinate)
15:53	52	34.2881	-9	56.0003	53.1	Sample K124
16:03	52	34.3140	-9	56.0267	54.7	Sample K125
16:05	52	34.3141	-9	56.0251	54.8	Sample K126
16:09	52	34.3142	-9	56.0245	54.5	Sample K127
16:11	52	34.3141	-9	56.0248	54.7	Heading North
16:45	52	34.4734	-9	56.2411	58.2	Sample K128
16:47	52	34.4738	-9	56.2413	58.5	Sample K129
17:04	52	34.5312	-9	56.3627	60.5	Sample K130
17:06	52	34.5311	-9	56.3627	60.6	Sample K131
17:07	52	34.5311	-9	56.3630	60.6	Sample K132
17:08	52	34.5311	-9	56.3630	60.1	HD off, End of dive

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 17/09/2024
Dive: CE24010_ ROV_23
Location: Offshore Kerry
Scientists: John / Rebekka



Box	Sample	Lat	Long	Depth m	Time	Comment
A	K123	52°34.2893	9°56.0014	56.3	15:48	
B	K124	52°34.2893	9°56.0014	56.3	15:53	
C	K125	52°34.3153	9°56.0276	57.4	16:04	
D	K127	52°34.3158	9°56.0261	57.7	16:09	
E	K126	52°34.3158	9°56.0261	57.7	16:07	
F	K128	52°34.4795	9°56.2430	61.3	16:45	
G	K129	52°34.2430	9°56.2430	61.3	16:47	
H	K130	52°34.5327	9°56.3634	62.5	17:05	
I	K132	52°34.5327	9°56.3634	62.5	17:07	
J	K131	52°34.5327	9°56.3634	62.5	17:06	

CE24010-ROV23 Basket photo

CE24010-ROV23 Wet lab photo

No wet lab photo

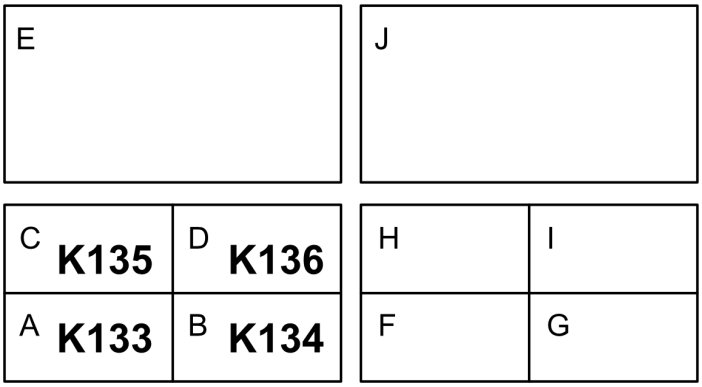
ROV DIVE LOG

Survey : CE24010 ROV Dive: ROV24 Scientists Andy / John / Jonathon / Leon
Date: 17/9/2024 Location: Offshore Kerry

Time	Lat		Long		Depth	Observation
	Deg	Min	Deg	Min	(m)	
18:26	52	38.9450	-9	51.3275	56.0	HD live, dive started
18:41	52	38.9771	-9	51.4143	58.0	Been heading NW, s0 far, too rugged to land
18:59	52	39.0022	-9	51.4691	63.0	Heading West
19:03	52	39.0019	-9	51.5021	66.2	Stopping to attempt sampling, got Sample K133
19:05	52	39.0019	-9	51.5021	66.2	Sample K134
19:10	52	39.0029	-9	51.5012	66.7	Sample K135
19:11	52	39.0029	-9	51.5012	66.7	Sample K136 (1 big stone, 1 small ston, small stone returned to ocean)
19:12	52	39.0026	-9	51.5026	66.7	HD stop, End of dive

ROCK SAMPLE LOG SHEET

Survey: CE24010 PoroClim2
Date: 17/09/2024
Dive: CE24010_ ROV_24
Location: Offshore Kerry
Scientists: John / Jonathon



Box	Sample	Lat	Long	Depth m	Time	Comment
A	K133	52°30.0019	9°51.5021	68.0	19:05	
B	K134	52°30.0019	9°51.5021	68.0	19:09	
C	K135	52°30.0028	9°51.5015	68.4	19:10	
D	K136	52°30.0028	9°51.5015	68.4	19:11	
E	**X**					**NO SAMPLE**
F	**X**					**NO SAMPLE**
G	**X**					**NO SAMPLE**
H	**X**					**NO SAMPLE**
I	**X**					**NO SAMPLE**
J	**X**					**NO SAMPLE**

CE24010-ROV24 Basket photo

CE24010-ROV24 Wet lab photo