



SEAROVER 2017

Deep Water Reef Habitat & Species Video Analysis

Full Report, July 2018

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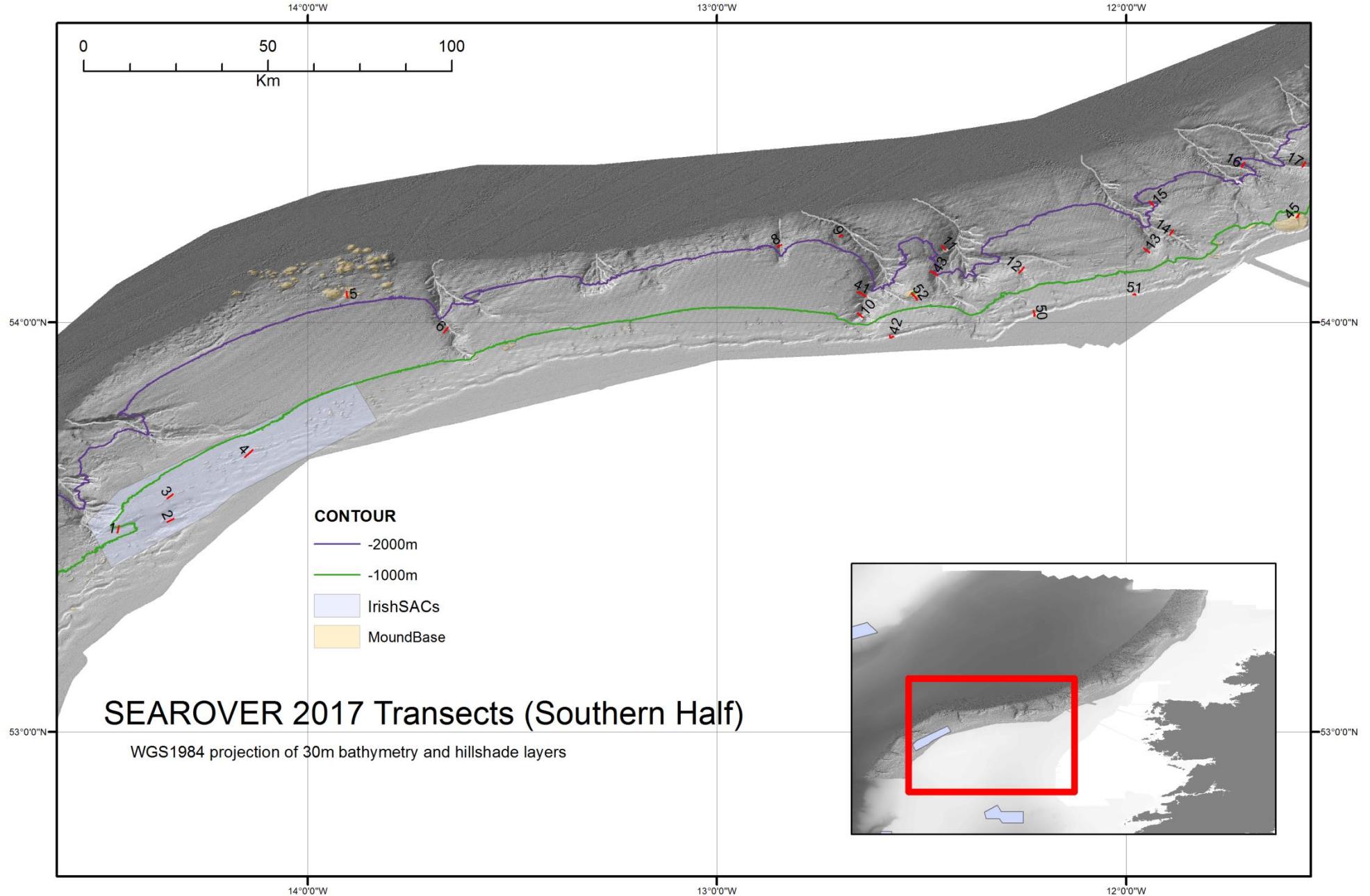
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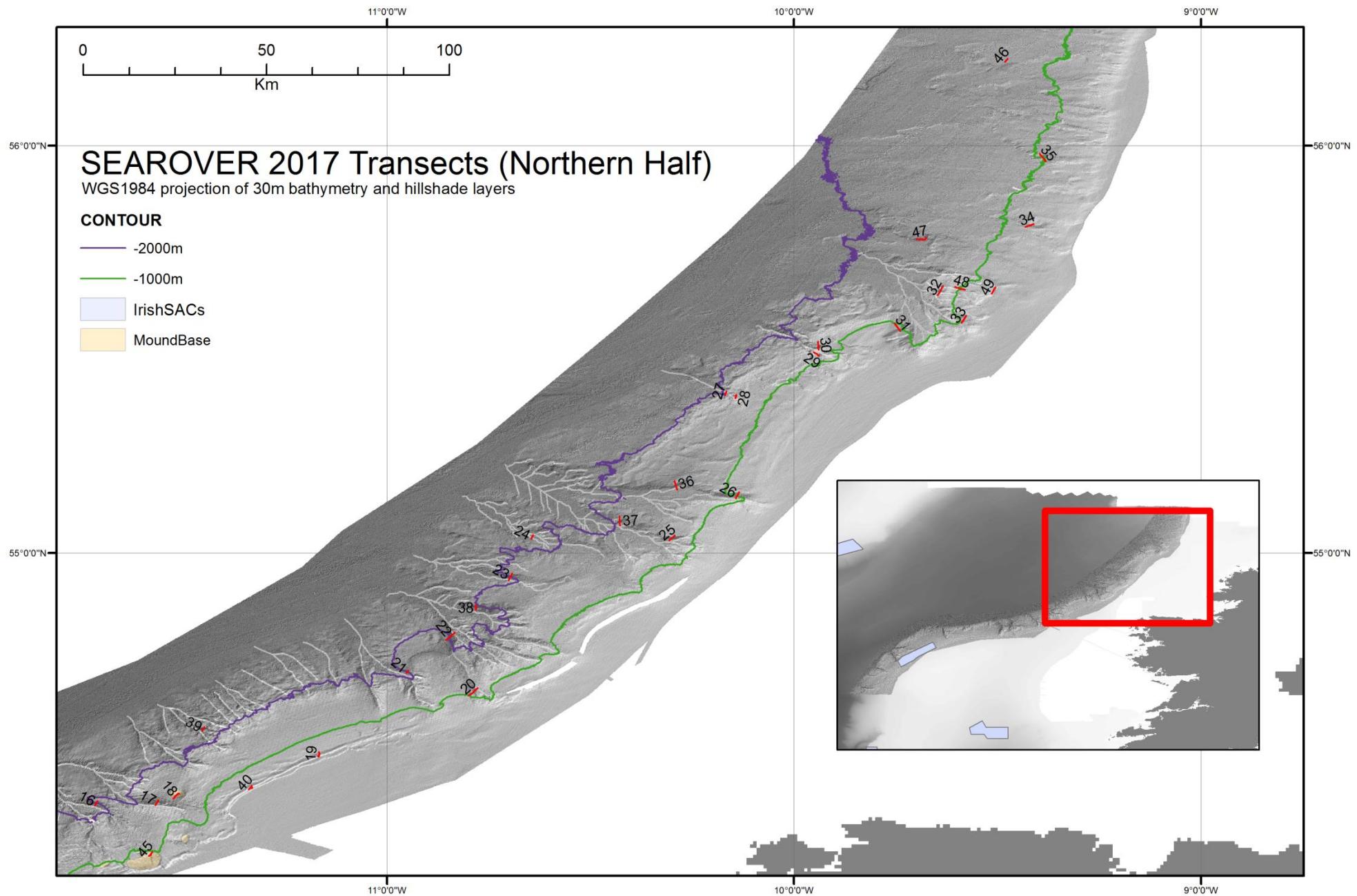
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Figure 1 (OVERLEAF) The survey area and locations of dives undertaken during SeaRover 2017 split into southern and northern halves for ease of viewing.





1. Executive Summary

1.1 General Findings

The Sensitive Ecosystem Assessment and ROV Exploration of Reef (SeaRover) 2017 survey was commissioned by the National Parks and Wildlife Service (NPWS), funded by the European Maritime and Fisheries Fund (EMFF), and coordinated and led by INFOMAR (Integrated Mapping for the Sustainable Development of Ireland's Marine Resources) and Ireland's Marine Institute.

SeaRover 2017 aimed to map the distribution and abundance of Ireland's biogenic and geogenic reef along the Irish continental margin from Porcupine Bank up to the northern border with UK waters (Figure 1). This report provides a detailed ecological analysis of the HD footage acquired over the 50 ROV dives undertaken during this survey, and represents a baseline dataset for future monitoring efforts in the region.

The following briefly summarises the findings of this analysis, with additional detail available in the subsequent chapters.

Reef/Non-reef

- 40 dives encountered geogenic reef
- 13 dives encountered biogenic reef, of which:
 - 6 may be described as healthy
 - 5 naturally dead due to being formed beneath cliff features
 - 2 dead due to climate, fishing pressures, or both
- 9 dives hosted neither biogenic nor geogenic reef, but:
 - 3 of these hosted other vulnerable biotopes

Diversity

- 367 putative species were identified from HD video footage supplemented by high resolution imagery (using an operational taxonomic unit (OTU) system as it is not always possible to identify fauna to species level)
- 137 OTUs were identified in the most species rich dive (Dive 488/ Transect 20)
- 34 OTUs were identified in the least species rich dive (D470/ T24)
- 66 OTUs were identified on the average dive
- 23 OTUs were found in more than half of the transects
- 56 OTUs were found in only one transect

Biotopes

- 101 potential biotopes were identified in line with the Marine Habitat Classification for Britain and Ireland (v.15.03), of which:
 - 58 are existing biotopes, un-altered from the MHCBI listing
 - 37 are minor variants of existing biotopes
 - 5 are potential new biotopes, or variants which may warrant becoming new child biotopes

- A transitional/co-occurring biotope complex was also encountered multiple times which may warrant future consideration as a biotope of its own.

Conservation targets

- 44 dives encountered conservation listed habitats, being either an ICES Vulnerable Marine Ecosystem, and/or an OSPAR Threatened and/or Declining Habitat.
- 21 dives encountered conservation listed species (ICES/IUCN)
- 2 conservation listed species were encountered repeatedly:
 - 15 dives encountered *Hoplostethus atlanticus* (Orange Roughy) including one dive where they were aggregated and abundant (D464B/T18)
 - 8 dives encountered *Centrophorus squamosus* (Leafscale Gulper Shark)

Observations of note

- The pigtail coral, *Radicipes cf gracilis*, has only rarely been recorded in the Rockall Trough, but was encountered on 7 SeaRover dives, and was twice encountered in loose aggregations (D467/T22, D469/T23).
- *Solenosmilia variabilis* reefs were encountered as deep as 1757m (on D458/T43).
- The community found on D453/T5 included many species that were either not encountered again, or that were found only rarely on other dives (e.g. OTU1157 Keratoisis sp (a fine, branched morphotype), was common on this dive but never encountered again). This dive offered the most unique community, probably due to being one of only a very few dives below 2000m on hard substrate. There were also multiple elasmobranch egg cases encountered here suggesting that this mound may be a nursery area.

1.2 Recommendations

Future surveys of this nature will be able to follow the SeaRover 2017 protocol with good results. The survey design was comprehensive and well co-ordinated. The following advice is therefore offered for consideration only but may be able to provide minor improvements. The aim of these recommendations is to improve consistency, ease analysis, and enhance the versatility of the data once acquired.

1.2.1 OFOP Logging Preparation

The OFOP logging process provides a useful overview and initial analysis of dive observations. However, the process is intensive and prone to mistakes and inconsistent identifications. Consistency and ease of use could be improved by using one or both of these suggestions.

a) Pre-familiarise scientists with categories

Ideally, the OFOP logging scientists should be aware of all the buttons available on the OFOP list prior to their first logging session. The vast majority of button pushes during SeaRover2017 were generic labels (thousands of records each, e.g. sea pens, anemones, fish). This is highly appropriate if the observer is uncertain about species identification, however more training might increase the usage of species or taxonomic group names which would benefit those who need the OFOP logs to provide early analysis data.

A guide booklet with images associated to the categories offered may be a useful addition, allowing people to flick through and familiarise themselves with example images of species, geomorphology, and habitats that correspond with the button list. One could be kept in the ROV shack as an *ad hoc* reminder. Furthermore this could be targeted to ensure that conservation important species are focussed upon, in order to get a more accurate representation of those species important to the OFOP data users, across the whole survey area as early as possible.

Here are a few key common misidentifications from SeaRover 2017:

- *Solenosmilia*, *Lophelia*, and *Madrepora* were logged interchangeably. Identification improved throughout the cruise but there were still often misidentifications. This common misidentification improves with experience, but early training might reduce the chances of this. The *Solenosmilia* button was only used in Leg 2 (this may have only been switched on then).
- Leafscale gulper shark: there are 329 OFOP records of this animal, but only 14 were observed in the subsequent analysis. This button was probably used to note any sharks present, rather than this species. However as a listed species of conservation interest it would be beneficial for scientists to recognise it above other species and a generic button highlighted for more general use.
- *Aphrocallistes sp*: often mis-identified, but it is unclear what it was confused with. E.g. in D497_T52 it was recorded in OFOP 8 times, representing at least 3 occasions with large gaps between, but this species was not present. This species was recorded 11 times in leg one, and 539 times in leg 2, but only a couple of dives hosted this species (this will be investigated further to discover what it may have been mistaken for).
- *Stichopathes sp* (whip like): was used for most whips corals (e.g. *Lepidisis*, *Radicipes*, *Distichoptilum gracile* and the two forms of *Stichopathes*). This is an example of where a more generic button may have helped, and how records of the species (which is quickly recognisable if known) would not be representative of the distribution of the orange antipatharian coral it suggests it represents.
- There are a lot of under-used buttons, with less than ten OFOP records but frequent encounters throughout the cruise. Many will have been captured with more generic buttons, but could be highlighted as likely encounters on future trips for more accurate recording. e.g.
 - *Ophiomuseum lymani* is a recognisable large white ophiuroid that forms the basis for a biotope on mixed sediment and was encountered as such many times but was recorded only once.
 - *Pennatula aculeata*: a small purple sea pen, resembling a stooped feather. This was seen in vast fields on one dive, and was frequently encountered throughout the cruise

b) Consider changing buttons (some reordering, additions, and list reduction)

There are many useful categories included in the existing OFOP button list, however given the large geographic, depth, and habitat ranges being surveyed, different locations will need different buttons. A long list makes it very difficult to find all the buttons that may be required, resulting in some features being missed or mis-logged. To avoid this, the button list should be reviewed and refined if possible to improve the chances of finding buttons and logging observations appropriately. The

following are only suggestions that could be considered, expanded upon, altered, or ignored with the advice of OFOP loggers and users of the output observation files. To aid this process more smoothly and offer more specific suggestions, a re-organised button list is provided with this report.

List arrangements:

THE TOP 15 BUTTONS (button IDs 1-15):

- These should be the most generic or important to log.
- Consider removing “terrace” and moving “soft sediment” up here from the substrata list.
- “Living Coral” could be changed to “Coral Reef”, as this category is captured by more specific buttons (e.g. Gorgonacea, Black/Thorny, Stony Coral, or species specific categories).
- “*Solenosmilia*” should be added to this list of buttons.
- “White Chalk” could be moved to the hard substrate section of list 3 and exchanged for “coarse” to capture gravel/pebble bottoms.
- There are some empty slots that could be filled here. “Coral garden” might also be useful to log as it is representative of mixed coral aggregations which is a listed habitat. Also a “sampling” button would be useful to indicate when a sample has been taken.
- Some minor reordering would allow these to be grouped into columns i.e. hard substrates (vertical/inclined/horizontal), other substrates (rocks, coarse, soft), Coral habitats (reef, garden, rubble), reef building species (Lophelia, Madrepora, *Solenosmilia*), and notes (Sampling, OBSCURED, Interesting?). This might make it quicker and easier to find buttons whilst logging.

“MORE BUTTONS” (16-33)

- Currently there are buttons for both % living (<25%, 25-50%, >75%), and % dead (<25%, 25-50%, >75%). However these are co-dependent values meaning that e.g. 25% living implies 75% dead. These lists could be collapsed into one with no loss of data. This would free up 3 quick access buttons for other categories.
- The coral and biology sections are currently named the wrong way round.
- The biology category has one free button, perhaps a generic “coral” button would be useful if not sure what type beyond this.
- “Solitary colony” is not a useful button as it is captured by more specific buttons regarding what type of colony is observed. This could be replaced with the “Black/Thorny” button from the lists to make it accessible next to “Gorgonians”.
- “Cup corals” could be added to complete the set of generic coral buttons.
- Candidates for additional slots (unused or freed up by changes above) could be “Sea pens”, “xenophyophores”, and “sponge aggregation”; all of which are conservation listed biotopes and worth marking easily, perhaps under a heading such as “other listed habitats” supplemented by the suggested “coral reef” and “coral garden” buttons in the top 15 to complete the set.

- Note: while logging in OFOP you are flipping between this tab and the lists tab, it could therefore be worth moving all of these to the lists so that no flipping back-and-forth is necessary.

THE SIX LISTS (1XX to 6XX)

- As users spend most of their time flipping through these lists, it is worth making these as intuitively organised as possible. Currently the arrangement of categories is as seen in this simplified Table 1. It would be advantageous to reorder the categories and their buttons to ensure that:
 - only generic categories are in lists 1 and 2 (and 3) and that they adhere to category names (e.g. move the worm (indeterminate) from motile to sessile)
 - only specific species names are in the bottom three lists so that the logger knows to look in these panes only if they know exactly what they saw, otherwise they should focus on the top three lists.
 - The bottom lists could be reordered to improve search-ability, ensuring that major taxa are obviously grouped and labelled and species are alphabetically listed within these.

Species and Categories:

These should be reviewed to ensure they contain easy to identify species, and that the labels are easy to find.

- Check that shallow water species are turned off
- Switch off or rename those that are too specific to ensure consistent identification (e.g. there are four specific Umbellula species listed as well as an “Umbellula sp” button. IDs are more likely to be consistent if using only the “Umbellula sp” button.)
- Some species are listed by common name and others by Latin name (e.g. “googly-eyed cod” and “*Lepidion eques*”). It would be helpful to provide a label that captures both if possible, allowing people who know one name, but not the other, to locate the same button e.g. the existing label “Bluemouth redfish *Helicolenus*”.
- Sponges could be reduced to morphotypes rather than some of the species names, retaining only names for those which are quickly identifiable. (E.g. add “Lamellate”, “Spherical”, “Cup”, “Branching”, “Massive”, “Rock-Boring”, and retain “Pheronema – bird’s nest sponge”, “*Hyalonema sp*”, and “Venus Flower Basket” [Euplectella]).
- Buttons which are unclear, e.g. “Coral sp#1” should be removed.
- Species names should be grouped under relevant titles e.g. “Corals and anemones” should be renamed to “sea pens”.

1.2.2 Photograph Intervalometer

The SeaRover 2017 protocol for photography was to take images whenever something interesting appeared. This meant that on some dives there were hundreds of images taken, and on others there were only four.

The analysis process uses these images for species ID, sediment characterisation, representative images of the dive and a quick overview of what the dive surveyed. When the photographs were not

available screengrabs from the HD video were used but were of much lower quality than the photographs can provide.

Given that the photographs do not take up a lot of digital memory, we would advise that future surveys **increase the number of photographs taken per dive**. However, with a lot going on in the ROV shack during a dive, it is easy to overlook this task, and may be a burden to do manually. The optimal suggestion is therefore to:

- **ask the ROV pilots to set up an intervalometer** to take images e.g. once every minute
- then **continue to manually take images when subjects of interest appear** (as per SeaRover 2017).

Table 1 The order of the “lists” tab windows in the OFOP buttons for SeaRover 2017. Some alterations in where categories are located may make button searches more intuitive.

<p>List 1 MOTILE</p> <p>- motile inverts (includes echinoderms, arthropods, molluscs, and worms. Mostly generic, some specific species)</p>	<p>List 2 SESSILE</p> <p>- sessile (includes anemones sponges, corals, ascidians, and additional worms, echinoderms, molluscs. Mostly generic, some specific species)</p>	<p>List 3 SUBSTRATA</p> <p>- substrata - hard sediment (includes soft, hard and some biogenic sediment types, as well as sponge field)</p>
<p>List 4</p> <p>- swimming - asteroids - brisgingidae - crinoids - ophiuroids - echinoids - holothurians - segmented worms (includes specific species and some generic categories of each, the first being mainly generic fish categories)</p>	<p>List 5</p> <p>- fish - crabs - squat lobsters - gastropods (includes specific fish species and specific species/generic categories under each of the other headings)</p>	<p>List 6</p> <p>- bryozoa - xenophyophore - gorgonian corals - stony corals - glass sponges - sponges - Corals and anemones (includes specific species/generic categories each of the headings, the last being sea pens)</p>

This will result in a minimum number of images per dive and provide an easy-view comprehensive overview of the dive whether subjects of interest were encountered or not.

1.2.3 ROV Operations Reminders

A lot is going on in the ROV shack during survey but it is important to continually consider the quality of the data being collected. The following issues were encountered on multiple occasions during SeaRover2017, all of which are quick and easy to rectify during footage acquisition provided you notice that they are occurring.



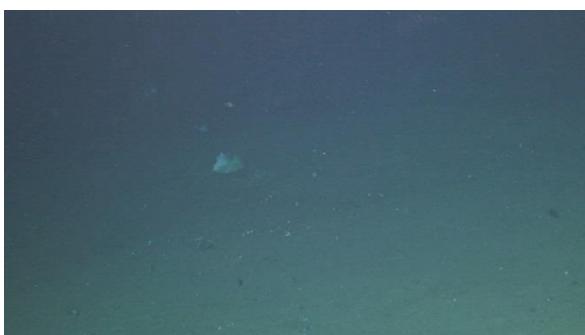
a) White balance

The ROV pilots are often on top of this but can still forget to make sure this is done. The result is footage which appears overly blue/green. If white balance adjustments have been made but this is still the case, check whether the height of the ROV is correct and whether you still have issues when closer to a subject.



b) ROV Height

If the ROV is flying too high any smaller species encountered will be hard to identify. Counter this by switching on lasers and ensuring that you could see and identify anything that falls between them and occupies 1/3 of that span (~3cm). (The light-pool here is also an issue, see next point)



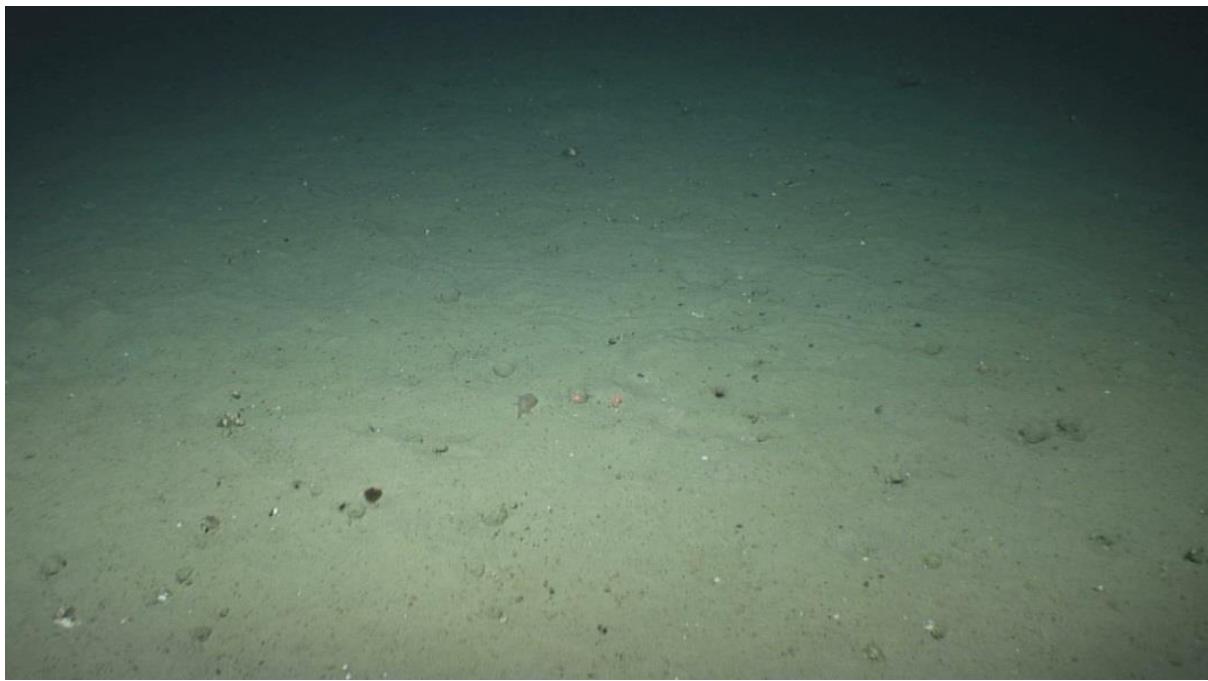
c) Camera angle/ Light pool

Monitor the camera angle relative to the light pool. In this image the light pool is off to the bottom left but the camera is focussed in the dark area beyond. This offers poor quality data and misses the good quality imagery that would be available if the camera panned down. Make the light pool fill a minimum of 2/3 of the image.



d) Zoom

It is great to stop and zoom and get the detail of species and interesting sights but when moving again remember to zoom back out. Again the lasers can provide a guide.

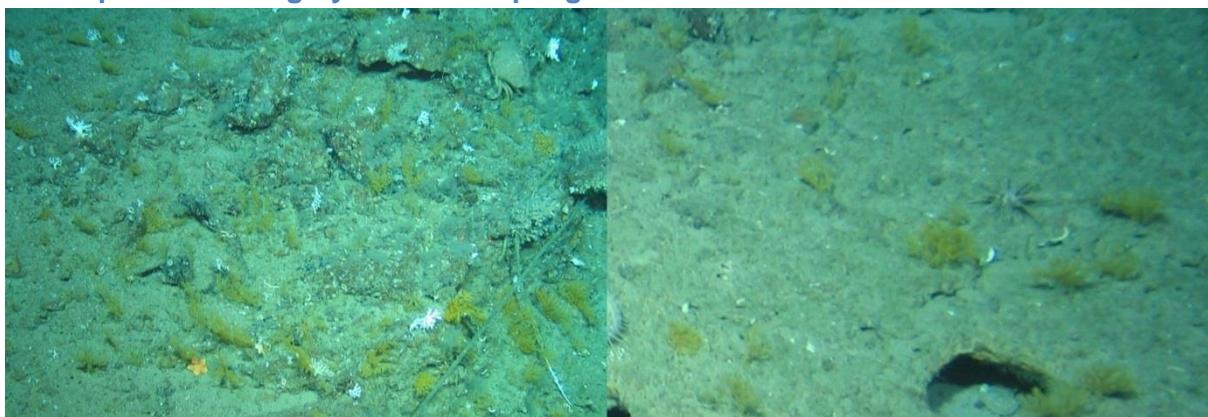


This image provides a good guideline:

- **white balance is optimised** i.e. the image is not too blue/green
- the **lasers are on** so we can see how high the ROV is and can make out species ~ 3cm in size
- the **light pool fills the majority of the image** giving detail across the whole screen
- the **zoom level is good for moving** along, the field of view is about 2m wide (the lasers occupying about 1/20th of the image but still at a height where you can identify smaller species).

NB: one option that has worked in the past is to use “blu tack” (or equivalent) to leave two dots on the bezel above the screen in the ROV shack showing the optimal width of laser points. This provides a quick visual reference check that ROV height/zoom is optimised and lasers are on.

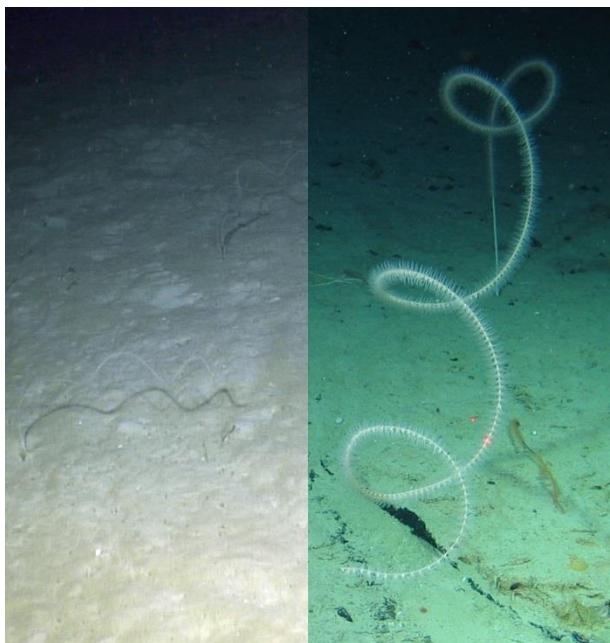
1.2.4 Species ID imagery and/or sampling



There are many species encountered during SeaRover 2017 that are hard to identify, especially when the ROV never stops to take a more detailed look. Despite encountering them in large

numbers on several dives, the above yellow corals remain unidentified to the extent that they are logged as Unknown Anthozoans!

It is very hard to know whether another scientist would be confident of the species, so we recommend a **policy of stopping to get at least one high resolution image** or a small amount of close up footage when an animal unknown to those in the ROV shack is observed. This sacrifices just a minute of survey time, but may provide valuable analysis data and may even offer new records of species not previously known from Irish waters.



One species that this was conducted successfully for during SeaRover 2017 is *Radicipes cf gracilis*.

The image on the left is typically how they appear on the video, very fine whips whose shadow is easier to make out than the animal itself. One stop to take close up imagery (right) provided the polyp arrangement detail able to get a good identification. This resulted in the first official records of this species forming aggregations in Irish waters (and it is also unknown in UK waters). Current records are from Norwegian, Icelandic and Canadian waters with a conspicuous gap in the Rockall Trough region (Buhl-Mortensen et al 2014).

If time and situation permits, a sample of any species that is easy to grab the whole of (i.e. if you can fit the entire animal in a ROV sample box) would be very valuable for ID purposes, especially if many of these animals are encountered.

A “wanted” list with species “mugshots” will be provided based on SeaRover2017 data ready for SeaRover 2018.

1.3 New Biotopes

It is important first to note that this analysis cannot offer any definitive new biotopes as all biotope assessments were made by eye. All suggested new biotopes should be quantitatively re-analysed to ensure that these suggestions are sufficiently distinct from existing biotopes before being suggested for official consideration.

Biotope assessments were made in line with the Marine Habitat Classification for Britain and Ireland (v.15.03) new deep-sea section as a reference point.

Additional details of all biotopes encountered are available in Table 12 and Table 13 in the “quick-view metadata” section of this report.

1.3.1 Minor variants

The non-listed biotopes considered here as “minor variants” represent those biotopes which were found to be similar to existing biotopes but existed in different depth zones, substrates, or

morphologies. The existing classification acknowledges that these are likely to be found, but were not yet listed due to a lack of official records. This dataset may be able to offer such records for future list expansion.

Depth zones

The MHCBI list operates on a basis where biotopes are categorised by depth zone (mid bathyal, lower bathyal, upper abyssal, etc). Depth variant biotopes follow existing descriptions but are found in a new depth zone. For example, an “*Acanella arbuscula* assemblage on Atlantic lower bathyal mud (M.AtLB.Mu.EreCor.AcaArb)” is already listed, as are similar assemblages in shallower zones. This analysis encountered an “*Acanella arbuscula* assemblage on Atlantic upper abyssal mud” which is currently not listed in the classification but clearly warrants duplicating to this depth zone for future encoding as M.AtUA.Mu.EreCor.AcaArb.

- 25 potential depth zone biotope variants were encountered in this analysis

Substrates

The MHCBI also incorporates substrate information into biotope codes, meaning that variations in substrate type from existing listings should also be considered for future inclusion in the classification. These are more tentative suggestions than the depth variants as definitions of “mud”, “sand”, “coarse”, and “mixed” substrates are not always clear cut from video analysis. These suggestions should be reviewed with direct substrate comparisons of similar assemblages.

- 13 potential substrate biotope variants were encountered in this analysis

Morphologies

There were a couple of subtle variations on existing biotope encodings or detailed descriptions which are more likely to warrant either broadening the description of existing biotopes, or creating new child biotopes that could be nested into the existing structure. For example, there are descriptions of crinoid dominated communities in several depth zones and substrates, but this analysis encountered stalked crinoid communities which warrant expansion of this biotope grouping into new depth zones and perhaps substrates too. These may work better as a distinct child grouping of the crinoid community description that is currently has one child: the “*Leptometra celtica* assemblage”, capturing a comatulid crinoid community found in the mid bathyal. The *Democrinus sp* stalked crinoid community found in this analysis is considerably distinct from this group, bearing similarity only in the dominance of crinoids in the community. Consideration could therefore be given to diversifying the parent crinoid community biotope and adding a new child that captures the deeper sub-grouping of crinoid dominated communities.

1.3.2 Potential new biotopes

The following five variants observed in this analysis can be grouped into three potential new biotope complexes with variable depth and even morphology components, but considerable similarities that should be investigated further.

Potential New Escarpment biotope



Figure 2 Example image of the potential new escarpment biotope (IMG_8254 from D492/T50)

Noted in the analysis as:

- (var) M.AtMB.Ro.MixCor.DisLop: (Escarpment variant of) Discrete *Lophelia pertusa* colonies on Atlantic mid bathyal rock and other hard substrata
- (var) M.AtUB.Ro.MixCor: (Escarpment variant of) Mixed cold water coral community on Atlantic upper bathyal rock and other hard substrata
- Seen in transects 19, 42, 50, 51

This potential new biotope is associated with vertical walls, and notably is dominated by *Desmophyllum sp* solitary scleractinians, purple anemones (*Actiniaria sp13*, OTU478), *Ceremaster sp* sea stars, *Cidaris cidaris* echinids, and encrusting fauna. This may occur with or without discrete *Lophelia pertusa* colonies.

Although logged as a variant of a mixed coral assemblage, this could equally be termed a Solitary Scleractinian community on (vertical or overhanging) rock.

Note that similar has definitely been observed before, but the consistency of the assemblage on escarpments and canyon walls may recommend this as at least a new child biotope.

Potential New Deep Stalked Crinoids, Sponges, and Corals biotope

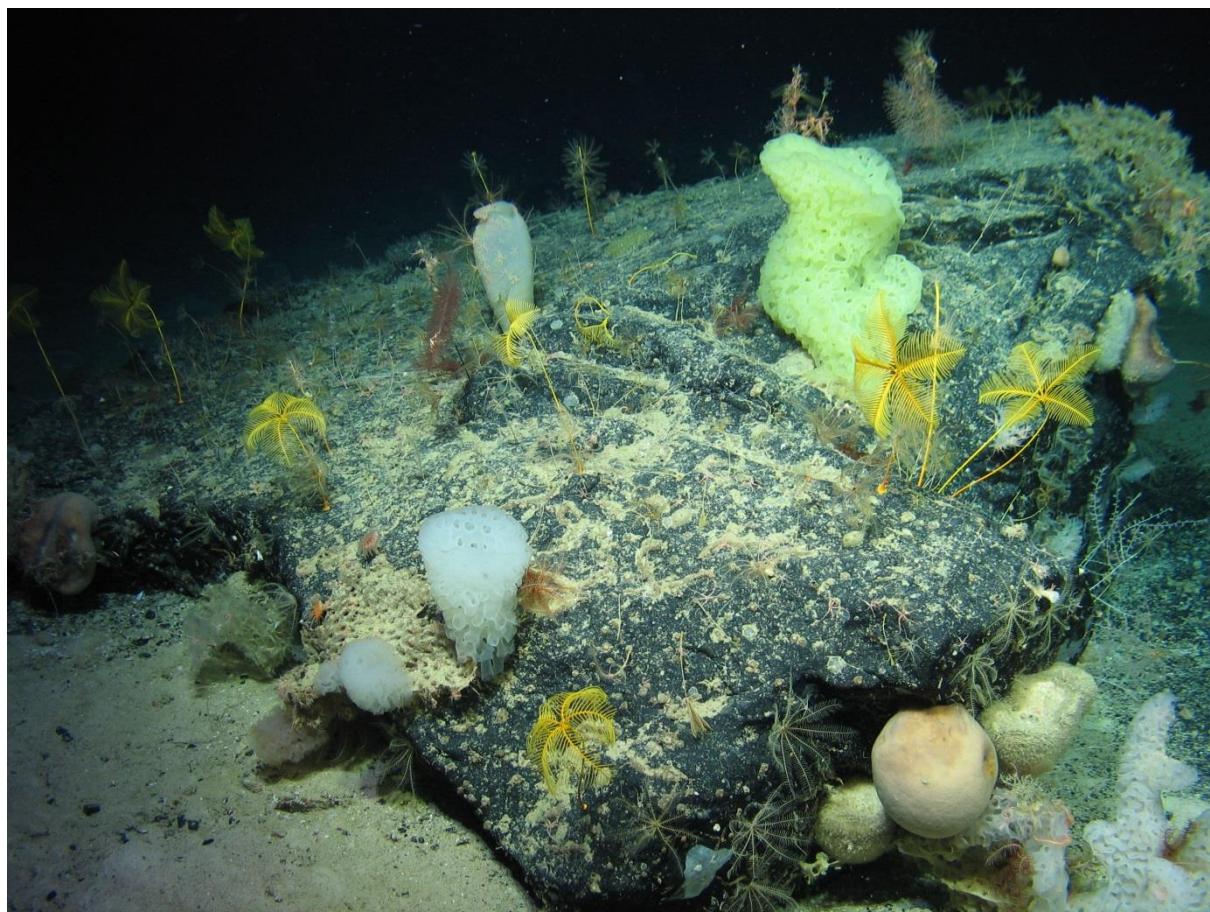


Figure 3 Image of potential new deep biotope with stalked crinoids sponges and corals (IMG_3346 from D453/T5)

Noted in the analysis as:

- (var) M.AtLB.Ro: (stalked crinoids, sponges, and corals on) Atlantic lower bathyal rock and other hard substrata
- (var) M.AtUA.Ro: (stalked crinoids, sponges, and corals on) Atlantic upper abyssal rock and other hard substrata
- Seen in transects 5, 8, 16, 22, 39, 41

This assemblage was found on deeper transects attached to hard substrate. It appeared to be diverse, always hosting mixed stalked crinoids, sponges, and corals (especially Chrysogorgiids) in order of abundance. It resembles the mixed coral rock assemblages, but the corals are rarely dominant.

This assemblage is likely to be new to the classification due to previous sampling bias. The UK region of the Rockall Trough rarely reaches this depth, and it is only recently that visual sampling gear with sufficient depth range has become available. Water mass boundaries at these depths are likely to promote diversity with species limited to each water mass meeting at the interface. There are likely to be more undiscovered upper abyssal rock assemblages in Irish waters, and exploring geogenic features that promote them should be a priority for the future.

Potential New Hydrozoan and Bryozoan biotope

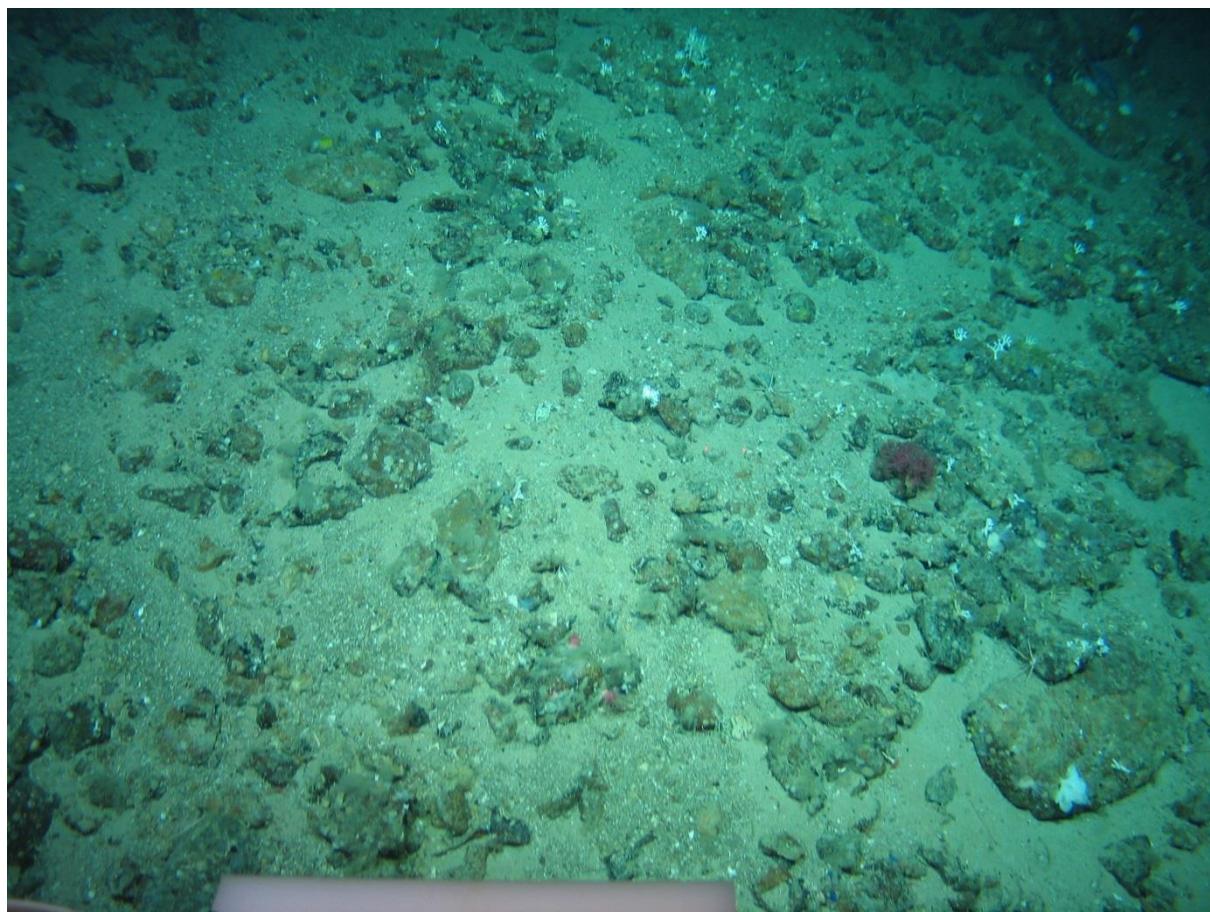


Figure 4 Image of potential new biotope dominated by hydrozoans and bryozoans (IMG_8215, D492/T50)

Noted in the analysis as:

- (var) M.AtUB.Ro.SpaEnc(.HydBry): (variant) Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata (dominated by Hydrozoans [e.g. Stylaster/Pliobothrus] and Bryozoans [e.g. Reteporella])
- (var) M.AtUB.Ro.MixCor(.HydBry): (variant of) Mixed cold water coral community on Atlantic mid bathyal rock and other hard substrata (with dominant Hydrozoans and Bryozoans) NB similar presented with more corals present, possibly transitional, logged as a coral dominant biotope in transects 4 and 42.
- Seen in transects 4, 42, 50, 51

This assemblage seems to resemble the sparse encrusting community often dominated by *Psolus squamatus* sedentary holothurians. However in this instance *Psolus* is rare/ non-dominant, with hydrozoan (*Pliobothrus sp*, stylasterids, and hydroids) and bryozoan (*Reteporella sp*) species now dominating the community. Some discrete *Lophelia pertusa* colonies were also present but not prolific.

This analysis recommends this assemblage as a potential child of the existing sparse encrusting community, but subsequent quantitative analysis may warrant a different classification.

1.3.3 Co-occurring biotope complex

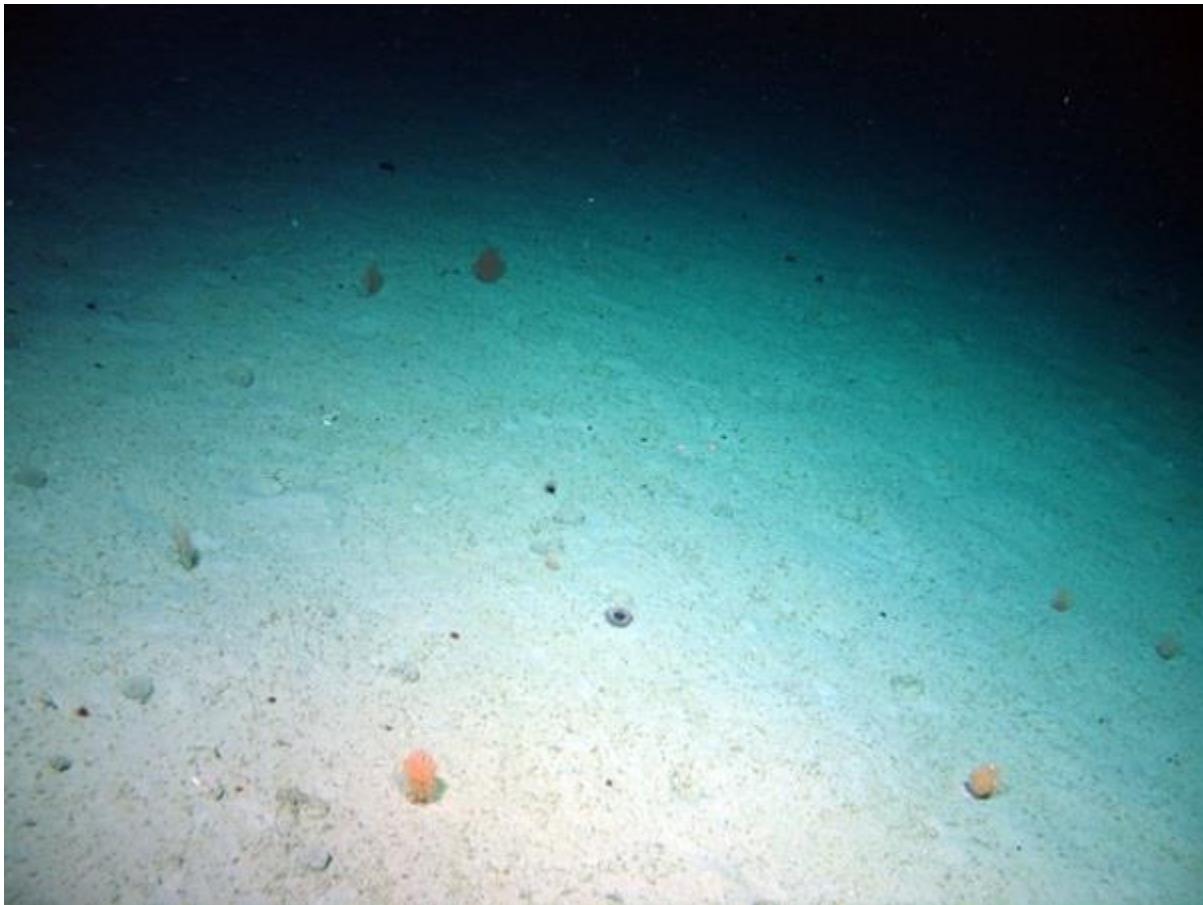


Figure 5 Image of the epifaunally diverse soft sediment biotope complex that was frequently encountered (IMG_7100, D487/T25).

Noted in the analysis as biotope co-occurrences of two biotopes with additional dominant species
e.g.:

- M.AtLB.Mu.SolScl/M.AtLB.Mx.XenCom.SyrFra
- M.AtMB.Mx.SyrFra/M.AtMB.Mu.SpnMeg
- M.AtLB.Mu.XenCom.SyrFra/M.AtLB.Mu.EreCor.AcaArb
- M.AtLB.Mu.SolScl/M.AtLB.Mx.XenCom.SyrFra (*Acanella arbuscula* also a dominant species)

Whether a transitional biotope or a potential new “biotope complex”, these interesting assemblages are tentatively referred to in dive summaries as “epifaunally diverse soft sediment”. There is some variation in how this biotope complex co-occurs, and the analysis sought to reduce its appearance to a dominant/secondary biotope record, giving precedence to the more abundant biotope-forming species, while recording additional dominant species alongside.

Characteristically soft sediment hosts the assemblage (or assemblages), with co-dominant species usually consisting of two or more of the following: *Syringammina fragilissima* xenophyophores, *Acanella arbuscula* erect corals, Solitary Scleractinians (Caryophyllidae/Flabellidae), sea pens, and burrowing anemones. Mixed echinoderms (e.g. *Zoroaster fulgens* sea stars, *Amperima rosea* holothurians, *Phormosoma placenta* echinoids) may also be present and abundant.

It remains unclear whether this should be considered a series of transitional biotopes or a new assemblage, but the diversity and repeat encounters suggest that further work should be done to characterise and classify this assemblage accordingly.

1.4 Future Work

The SeaRover 2017 expedition has provided a rich dataset from the northwest Irish continental margin. Despite being situated in one of the best explored regions of deep sea in the world (the Rockall Trough has been described as the “cradle of deep sea biology” (Gage 2001)), SeaRover 2017 has definitely encountered new species and habitats never seen before in the region.

The main reason for the new discoveries is the remit to target geogenic and biogenic reef, and then exploring the full depth range of the landscape in question. Historic studies will have explored the region with trawls that are not suited to sampling reef features, and previous visual surveys did not have either the depth range or the high resolution that the Holland I ROV can now offer. This survey therefore stratified its sampling design to target areas previously beyond the reach of sampling efforts.

It seems imperative that future SeaRover surveys continue this exploration over other parts of Irish waters. The targeting of deep (>2000m) seabed features is the most likely strategy to continue to yield new discoveries, and would be beneficial to place SeaRover 2017 observations in a wider context. For example, the apparently unique community and species observed in transect cannot yet be described as unique, as it may be ubiquitous when exploring comparable substrates and depths.

Future survey efforts could focus on:

- The continental margin south of the 2017 survey area, tracing from Porcupine Bank to Whittard Canyon (although this should be tempered by existing well documented surveys in the Porcupine Seabight and Whittard Canyon areas)
- Rockall bank and its eastern flank
- Lorien Knoll, Fangorn Bank, and Edoras Bank in the western extent of Irish waters. These areas in particular offer the best chance of finding more unique geogenic and biogenic reef features due to their depth and offshore location offering a lower chance of impact from fisheries.

This dataset was also designed to offer a baseline for future conservation decisions and monitoring efforts. Many sensitive OSPAR and ICES listed habitats were encountered on SeaRover 2017 and may warrant the establishment of new areas of conservation after consultation with the fishing community.

Should any new conservation areas be created these will need to be monitored periodically to ensure the efficacy of protection measures and to confirm that protection efforts are worth maintaining. Thought should be given to the most effective monitoring strategies, with reference to scientific experimental design. The HD video collected on SeaRover 2017 is certain to offer an effective medium for future comparisons due to the ability to “revist” past statuses. Measures of diversity are likely to be useful, but care should be given to understanding natural variability and ensuring like-for-like comparisons across depths and substrates (Howell et al 2010).

2. Introduction

Ireland, as an EU member state, is obliged under the Habitats Directive (EC 92/43/EEC, sub-article 6.2) to protect vulnerable habitats from destructive human activities. This includes marine habitats in offshore waters which are mainly threatened by fishing pressures.

This survey was commissioned by the National Parks and Wildlife Service (NPWS), funded by the European Maritime and Fisheries Fund (EMFF), and coordinated and led by INFOMAR (Integrated Mapping for the Sustainable Development of Ireland's Marine Resources) and Ireland's Marine Institute. The aim of this survey was to map the distribution and abundance of Irelands offshore biogenic and geogenic reefs, and create a baseline dataset which will inform the future monitoring of these habitats.

The Sensitive Ecosystem Assessment and ROV Exploration of Reef (SeaRover) survey was undertaken in July 2017 aboard the ILV Granuaile. The Marine Institute's Holland I ROV was used to explore along the Irish continental margin from Porcupine Bank SAC up to the northern border with UK waters.

50 Transects were completed, collecting 147 biological specimens and 49 sediment samples over the four week period. All transects are accompanied by HD footage, high resolution digistills images, and standard definition footage from several angles.

This report provides a detailed biological analysis of the HD footage collected, supplemented by the stills images and standard definition footage if necessary.

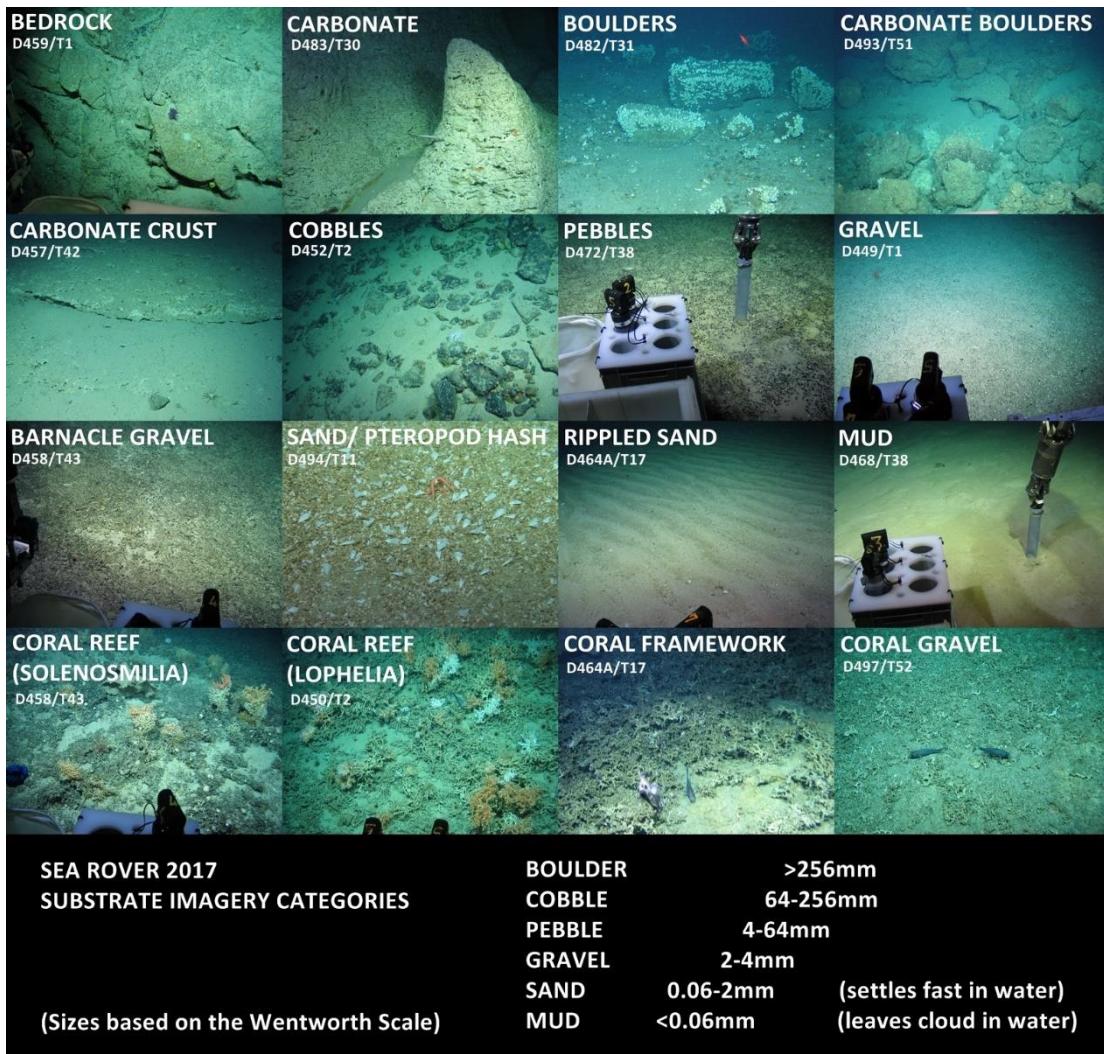
3. Methods

All data was generated after review of transect HD video. This was supplemented by high resolution digistills and standard definition composite video if necessary.

Each HD video was reviewed at least twice at up to 4x speed depending on the complexity of content. The first viewing was used to create the enhanced OFOP files, characterising substrate, geomorphologies and features, reef presence, Annex I reef type, biotopes, their dominant species, and the presence of listed species and biotopes. The second viewing was used to create a species list with the benefit of *a priori* SACFOR abundance estimates having previously reviewed the whole dive. This viewing also allowed for any amendments to the enhanced OFOP file data after a complete review of the transect.

3.1 Physical Data

Figure 6 Substrate categories used in this analysis



3.1.1 Substrate characterisation

Substrate characterisation may be done in many ways, the choice of method being dependent on the data types gathered and objectives of analysis. This analysis aimed to record substrate at a level that may be relevant to the fauna and biotopes being observed, with data resolution tempered by the resolution of HD video and stills imagery. An adapted Wentworth grain size scale was used, as shown by the chart in Figure 6 (all images in the chart are from SeaRover2017).

Primary and secondary substrates were logged where necessary, representing either mixed or mosaicked substrate areas. (e.g. boulders on sand, or frequently alternating patches of exposed carbonate protruding through mud). Some areas displayed a complex mixed substrate. Here either a primary and secondary substrate from the perspective of the dominant fauna were recorded, or a list of

3.1.2 Geomorphology, Features and Annex I habitat types

Geomorphological features were logged, primarily referring to the Annex I habitat list of geogenic and biogenic morphologies, but supplemented by additional descriptors where necessary (e.g. soft

sediment slope). Over-arching geomorphologies were assigned on the basis of transect locations, and larger landscape features targeted during transect planning. The features category highlighted any notable interesting landscapes observed (e.g. pinnacles, depressions). Strictly Annex I habitat categories were also recorded allowing these to be located and highlighted easily in the future.

3.3 Reef presence

Where biogenic or geogenic reef was encountered this was logged. There was an assumed minimum patch size of 5m x 5m (this is a standard minimum area used for biotope classification). The percentage of reef presence per transect is summarised as a proportion of cells marked as reef in the enhanced OFOP file when compared with the length of the dive. This means that the reef presence estimate is based on time, so may be skewed when there have been lots of stops for sampling or beauty shots.

If biogenic reef was present then an estimate of percentage living reef-forming-coral: percentage dead reef-forming-coral was also provided. However it should be recognised that a healthy reef rarely has >50% living colonies; the dead framework or parts of colonies providing the main habitat for other species. Table 6 provides a quick-view summary of all transects, what percentage was reef, and if biogenic what percentage are living. An additional note is provided as a provisional assessment of reef health and should be considered in tandem with the percentage data. For example, a 99% dead reef at the base of a cliff is likely to be a sign of healthy living colonies attached to the cliffs above rather than an unhealthy reef.

Percentages of living reef are estimated by eye, and therefore are roughly categorised as: <1%, <10%, <25%, 25-50%, >50%.

3.2 Biological Data

3.2.1 Biotopes

All biotopes were logged in line with the Marine Habitat Classification for Britain and Ireland (v.15.03) new deep-sea section where possible. Some new biotopes encountered were clear extensions of existing categories recorded at new depths. These were marked as a variant for future consideration e.g.

Existing Biotope:	Variant Logged in SeaRover 2017:	Potential future biotope:
M.AtUB.Ro.DeeSpo Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	(var) M.AtUB.Ro.DeeSpo (lower bathyal variant) Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	M.AtLB.Ro.DeeSpo Deep sponge aggregation on Atlantic lower bathyal rock and other hard substrata

If the biotope appeared entirely new then the nearest appropriate parent biotope was identified and the biotope marked as a variant with new child label indicated in brackets e.g.

Existing Biotope:	Variant Logged in SeaRover 2017:	Potential future biotope:
M.AtUB.Ro.SpaEnc Sparse encrusting community on Atlantic upper bathyal rock and	(var) M.AtUB.Ro.SpaEnc(.HydBry) (variant) Sparse encrusting community on Atlantic upper bathyal rock and other hard	M.AtUB.Ro.SpaEnc.HydBry Sparse encrusting community with Stylasterid hydrozoans and bryozoans on Atlantic

other hard substrata	substrata (dominated by Hydrozoans [e.g. Stylander/Pliobothrus] and Bryozoans [e.g. Reteporella])	upper bathyal rock and other hard substrata
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Biotope changes were logged when patch size was assumed to be 5m x 5m or greater. Primary and secondary biotopes, like sediments, are logged to represent either concurrent or mosaicked biotopes. E.g. burrowing anemones are only associated with the mud in an area that also presents with dropstone boulders hosting mixed corals. Transitions or overlapping biotopes may also be encountered e.g. an echinoid dominated sediment bottom may also present patchy juvenile elpiid holothurian aggregations. Where two biotopes are present, one is always assigned as dominant.

3.2.2 Dominant Species

The dominant species were logged per biotope transition, as judged by eye. These are often intrinsically linked with the biotope description e.g. If “M.AtLB.Mx.SurOph.OphCer, *Ophiomusium lymani* and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment” is logged as the dominant biotope, it is likely that *Ophiomuseum lymani* that is the dominant species. However the biotope can be more vague in description e.g. M.AtLB.Ro.MixCor, Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata so the dominant species may indicate whether it was e.g. a *Solenosmilia variabilis*, *Chrysogorgiidae sp*, or *Stichopathes sp* dominated coral garden. Some of these more generic biotopes may warrant further subdivision in the future in line with reoccurring dominant species.

Occasionally no dominant species were apparent and this is logged accordingly. “No dominant species” usually occurs on soft sediment (which is not the main target of this survey) and is more indicative of the need to undertake infaunal sampling in these regions to better characterise the biotopes present.

3.2.3 Conservation Listed Species & Habitats

As the main purpose of this survey was to identify the occurrence of conservation targets in Irish waters, any species or habitats known to be listed by OSPAR or ICES were highlighted, with species counted where appropriate. The following list offers a complete overview of the potential listed habitats (OSPAR/ICES Type combinations) with the potential to be encountered in Irish offshore waters.

Table 2 OSPAR and ICES categories and subcategories, aligned to show where overlaps occur

OSPAR	ICES	ICES subcategory
Lophelia pertusa reefs	Cold-water coral reef	Lophelia pertusa/Madrepora oculata reef
(Lophelia pertusa reefs)	Cold-water coral reef	Solenosmilia variabilis reef
Coral gardens	Coral garden	Hard-bottom coral garden
Coral gardens	Coral garden	Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens
Coral gardens	Coral garden	Hard-bottom coral garden: Colonial scleractinians on rocky outcrops
Coral gardens	Coral garden	Hard-bottom coral garden: Non-reefal scleractinian aggregations
Coral gardens	Coral garden	Hard-bottom coral garden: Stylerid corals on hard substrata
Coral gardens	Coral garden	Soft-bottom coral garden
Coral gardens	Coral garden	Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens
Coral gardens	Coral garden	Soft-bottom coral garden: Cup-coral fields
Coral gardens	Coral garden	Soft-bottom coral garden: Cauliflower Coral Fields
Deep-sea sponge aggregations	Deep-sea sponge aggregations	Soft-bottom sponge aggregations
Deep-sea sponge aggregations	Deep-sea sponge aggregations	Hard-bottom sponge aggregations
Sea-pen and burrowing megafauna communities	Seapen fields	-
-	Anemone aggregations	Soft-bottom anemone aggregations
-	Anemone aggregations	Hard-bottom anemone aggregations
-	Mud and sand emergent fauna	-
-	Bryozoan patches	-
-	Hydrothermal vents/fields	-
-	Cold seeps	-

There are only four OSPAR listed species likely to be encountered at depth in Irish waters, all of which are fish or shark species.

- Portuguese Dogfish (*Centroscymnus coelolepis*, IUCN Near threatened)
- Gulper Shark (*Centrophorus granulosus*, IUCN Data Deficient)
- Leafscale Gulper Shark (*Centrophorus squamosus*, IUCN Endangered)
- Orange Roughy (*Hoplostethus atlanticus*, IUCN Vulnerable)

3.2.4 Species Lists & SACFOR

Species lists were compiled on a second viewing of the video. All species have been identified in line with Howell, Davies & van den Beld (2017, available online at <http://www.deepseacatalogue.fr/>) and supplemented with taxonomic literature. Expert advice was also sought from Kerry Howell, Louise Allcock, and known experts on twitter (e.g. Chris Bird (CEFAS, @SharkDevocean), Graham Johnston (MI, @GJShark), and Brit Finucci (NIWA, @BritFinucci) helped with Fish IDs).

All identifications were made to the highest taxonomic resolution possible from the footage and images available, and operational taxonomic units assigned to aid tracking future better IDs (in line with & supplementary to Howell, Davies & van den Beld 2017).

Species abundance measures were recorded using the MNCR SACFOR method (see Table 3). This method categorises abundances into six categories (**S**uper-abundant, **A**bundant, **C**ommon, **F**requent, **O**ccasional, **R**are) allowing faster approximation of abundance than more accurate count data, while allowing better agreement between observers than un-categorised count estimates.

Table 3 A SACFOR Table of abundance measures adapted from [JNCC's online table](#) to give corresponding counts/densities per average 2hr/2km transect length for SeaRover.

	Growth form		Size of Individuals/Colonies	COUNTS (1st col Based on 2hr/2km transect)				
	EncrSponge	Barnacles		S	M	L		
% cover	Crust/meadow	Massive/Turf		1-3 cm	3-15 cm	>15 cm	Densitiy measures	
>80%	S			S		>	1000-9999 / m ²	
40-79%	A	S		A	S		100-999 / m ²	
20-39%	C	A		C	A	S	10-99 / m ²	
10-19%	F	C		F	C	A	1-9 per 1m	
5-9%	O	F		O	F	C	1-9 per 10m	
1-5% or density	R	O		R	O	F	1-9 per 100m	
<1% or density		R			R	O	2-20 per transect	
					R	1-2 per transect	<1/1000 m ²	

3.2.5 Quality Assurance

To ensure the standard of identifications of animals 5% of transects (3 transects) were independently analysed by Dr Kerry Howell. Transects were selected to cover a range of habitats and depths and were as follows: T5, T22, T42. Each transect was reviewed and all taxa observed were noted. Taxa were identified using the species catalogue produced for the project. Taxon lists produced by Drs Ross and Howell were then compared for consistency. The results of the QA analysis show minor differences in the number of OTU's recorded between observers (Table 4). These differences are primarily a result of missed OTUs rather than discrepancies in identification (where observers disagreed on the identification of an animal). In many cases the missed OTU's resulted from differences in taxonomic resolution between observers. For example where one observer distinguished different forms of Bathycrinidae the other had identified all forms at the family level thus giving the impression of 'missed' taxa. In only a limited number of cases, the missed OTU's were taxa that the observer had overlooked. For all transects the combined number of OTU's observed on any one transect was consistently higher than that recorded by a single observer. This suggests lists of OTU's provided in this project are under-estimates of the number of taxa present rather than over estimates. Trends in the number of species between transects remained consistent between observers, as well as when considering only those OTU's in common, or the combined total number of OTU's. With interobserver agreement at >73%, this analysis is at a high quality level relative to published averages of 67-83% self-consistency, and 43-72% interobserver agreement (MacLeod, Benfield & Culverhouse 2010).

Table 4 Quality assurance of species identification between expert analysers.

Transect	Total No. O.T.U		No. O.T.U. in common	Inter-observer agreement	No of discrepancies in ID	No. O.T.U. missed		Combined total no. O.T.U.	Accuracy	
	KH	RR				KH	RR		KH	RR
	T5	80	76	73	88%	1	3	6	83	96%
T22	69	70	58	73%	3	9	6	79	87%	87%
T45	56	62	51	77%	1	10	4	66	85%	94%

3.3 Deliverables

3.3.1 Enhanced OFOP Files

Enhanced OFOP files are designed to combine the outputs of USBL and CTD data, initial OFOP observations, and detailed analysis recordings in such a way that is compatible with GIS data projections. In order to combine these data types:

- Times were synchronised in the ROV shack as much as possible at time of recording to ensure alignment of CTD and USBL/OFOP data
- CTD data was converted into .cnv text files for ease of manipulation using “SBE Data Processing” software (a Sea-Bird CTD Software which is part of the CTD recording used by Holland I).
- All data types were aligned using time as a common variable
- Quicktime video player allows the display of either recorded time or media time elapsed when reviewing footage, so both time values are provided to improve compatibility for future viewings.
- USBL data was retained as 1 second recordings to ensure consistency of position throughout the transect. All datatypes were aligned to this.
- Additional analysis variables (substrates, geomorphologies, reef types and percentages, Annex I habitats, biotopes, dominant species, and the presence of listed species and biotopes) were recorded into the final combined excel file and are aligned to the timestamps and positions.
- Sampling events were also recorded for ease of location in the future
- Image EXIF data for all dives was obtained using ExifTool for windows (freely available from <https://www.sno.phy.queensu.ca/~phil/exiftool/>) , allowing an easy alignment of digitills image filenames by timestamp.

Figure 7 Screenshot of an example “enhanced OFOP file” showing USBL data (columns B>I), CTD data (J-L), OFOP observations (M-N), and additional analysis parameters (A,O-AJ) all aligned by time (C).

3.3.2 Dive Summaries

Dive summary reports are provided per dive. A template was set up to ensure consistency of reporting. All dive summaries contain:

- time/location/image/sampling/planning metadata,
- a pair of maps showing planned location and actual track with biotope transitions (derived from the enhanced OFOP file).
- Four annotated representative images per dive displaying biotopes, substrates, species, and geomorphologies considered to be representative of the dive.
- A summary description detailing timings of biotope transitions and the progress/general observations of the dive.
- A physical data summary showing reef percentages, a list of substrates (dominant substrates for the dive are shown in bold), geomorphologies, features, annex 1 types and pressures encountered per dive.
- A biological data summary showing number of species, species list and SACFOR abundance measures, biotope list and their conservation status, biotope progression with dominant species (numbers aligning to the dive summary numbers in square brackets), and a summary list of the conservation listed habitats and species encountered.
- An area for additional comments regarding the dive if necessary.

Full dive summaries for all dives are presented in chapter 4.2 of this report.

3.3.3 Other deliverables

Reference images for species, pressures and substrates, along with example biotope video clips accompany this report.

GIS products are also supplied, created from the enhanced OFOP files. These will aid better visualisation of this analysis and allow further analysis of the cruise observations.

4. Results

This section is split into two parts:

- Quick view tables of dive metadata and summarised analysis details. These provide an overview useful for finding key statistics across dives and locating dives which warrant more detailed investigation.
- Comprehensive dive summaries. These provide an indepth overview of each dive, relating physical and biological analyses, metadata, example images, basic maps, and a video time stamped narrative. These will provide additional information after identifying dives of interest from the quick view metadata tables.

4.1 Quick-view metadata

The following tables provide an overview of the dives undertaken and their analysis summaries. Although shown as several tables in this report for ease of reading, they are also incorporated into one excel spreadsheet provided with the first task delivery for easy filtering and sorting of data. The Dive number, transect number and average depth columns are duplicated in each table for ease of reference.

Table 5 Time and location metadata for all dives, along with associated image numbers (images are stored as IMG_XXXX.JPG)

Dive	Transect	Start Date & Time (HD video)	Start Lat (USBL)	Start Long (USBL)	Start Depth (USBL)	End Date & Time (off Bottom/HD video off)	End Lat (USBL)	End Long (USBL)	End Depth (USBL)	DepthRange (USBL)	Average depth	Images
449	1	04/07/2017 10:56:13	53.48630833	-14.46494717	1082.58	04/07/2017 13:19:17	53.50207	-14.460913	898.96	897-1093	1029	3067-3100
450	2	04/07/2017 16:07:10	53.511748	-14.343048	780.82	04/07/2017 18:44:40	53.519759	-14.327252	661.43	660-781	717	3101-3174
451	3	04/07/2017 21:28:39	53.5794925	-14.3296835	735.68	04/07/2017 23:10:27	53.569701	-14.3432115	712.74	681-736	704	3175-3198
452	4	05/07/2017 02:52:12	53.6886	-14.134118	716.17	05/07/2017 06:28:59	53.67009317	-14.15369733	667.59	668-731	710	3205-3262
453	5	05/07/2017 11:51:10	54.07462117	-13.90515967	2264.72	05/07/2017 15:20:57	54.06019167	-13.902694	2107.02	1962-2266	2117	3301-3397
454	6	05/07/2017 20:08:18	53.98744117	-13.65765133	1848.81	05/07/2017 22:07:03	53.974319	-13.66757333	1489.81	1489-1849	1676	3398-3464
495	8	20/07/2017 10:45:23	54.18937567	-12.84365933	2331.38	20/07/2017 13:58:56	54.18407471	-12.852435	2067.27	2065-2332	2191	3873-8712
455	9	06/07/2017 17:26:16	54.21227833	-12.69359233	2533.48	06/07/2017 18:40:25	54.20863033	-12.69995583	2427.2	2427-2534	2645	3501-3577
456	10	06/07/2017 23:43:47	54.0120895	-12.64410083	1354.57	07/07/2017 01:44:19	54.02289933	-12.655651	1334.13	1313-1509	1397	3581-3618
494	11	20/07/2017 03:34:23	54.1767855	-12.442037	2311.65	20/07/2017 05:19:13	54.187286	-12.450233	2100	2099-2312	2205	8487-8566
459	12	07/07/2017 19:42:30	54.13444017	-12.24986133	1487.3	07/07/2017 20:10:19	54.12024817	-12.2615885	1367.42	1366-1647	1528	3917-4147
460	13	08/07/2017 00:21:32	54.17004483	-11.94242433	1441.9	08/07/2017 02:21:58	54.18046017	-11.956916	1305.98	1305-1519	1404	4150-4237
461	14	08/07/2017 05:25:44	54.21275667	-11.89344117	1770.38	08/07/2017 07:51:52	54.22526283	-11.8842355	1461.76	1460-1783	1644	4243-4602
462	15	08/07/2017 11:33:53	54.28479	-11.93313183	2044.98	08/07/2017 13:03:39	54.29487833	-11.9423867	1893.51	1891-2048	2000	4605-4627
463	16	08/07/2017 17:59:35	54.378665	-11.717654	2183.87	08/07/2017 19:48:49	54.39045567	-11.7114357	1894.14	1891-2184	2023	4638-4680
464A	17	09/07/2017 00:20:56	54.38001233	-11.56902233	1802.46	09/07/2017 02:23:21	54.39231483	-11.56190533	1518.06	1518-1803	1697	4683-4742
464B	18	09/07/2017 04:24:10	54.39621783	-11.5253325	1281.33	09/07/2017 06:24:06	54.40797517	-11.5105787	989.85	948-1281	1103	4801-4875
489	19	18/07/2017 14:35:06	54.50097833	-11.16929983	735.99	18/07/2017 15:10:47	54.4990955	-11.16856667	645.35	643-747	706	7800-7867
488	20	18/07/2017 03:46:47	54.6675005	-10.77824633	603.6	18/07/2017 08:49:51	54.6488955	-10.7995455	593.14	604-1308	1193	7218-7799
466	21	09/07/2017 20:01:25	54.7041795	-10.95277583	2092	09/07/2017 21:35:58	54.713808	-10.94721017	1879.56	1879-2092	1975	4935-5395
467	22	10/07/2017 01:54:54	54.80376867	-10.83368917	2292.76	10/07/2017 05:28:41	54.78555833	-10.8549823	1872.45	1872-2315	2115	5397-5460
469	23	10/07/2017 16:06:25	54.93291	-10.70132333	2070.86	10/07/2017 18:05:18	54.94968817	-10.69223083	1817.26	1813-2083	1961	5496-5543
470	24	10/07/2017 22:37:36	55.04355	-10.64612	2214.57	11/07/2017 00:00:38	55.033105	-10.64606867	2201.79	2202-2215	2208	5545-5582
487	25	17/07/2017 19:14:49	55.030391	-10.3064017	1491.2	17/07/2017 22:03:25	55.04211083	-12.29297033	1223.86	1212-1492	1333	6839-7217
473	26	11/07/2017 18:21:10	55.13452683	-10.14277	1100.06	11/07/2017 20:49:11	55.14921	-10.13484983	803.32	800-1100	926	5738-5919
485	27	17/07/2017 07:16:15	55.3875703	-10.16850417	1939.44	17/07/2017 09:01:00	55.39624267	-10.1659908	1872.33	1845-1951	1890	6687-6803
486	28	17/07/2017 12:28:41	55.379743	-10.143609	1637.41	17/07/2017 13:44:28	55.38778733	-10.1416228	1535.13	1532-1638	1582	6804-6838
483A	29	15/07/2017 21:48:49	55.49244167	-9.9512267	1508.68	16/07/2017 01:03:46	55.48437933	-9.93909233	1189.31	1107-1506	1315	6401-6580
483B	30	16/07/2017 02:49:48	55.49843017	-9.939302	1561.92	16/07/2017 05:28:18	55.51872833	-9.9408315	1374.64	1333-1563	1422	6583-6684
482	31	15/07/2017 14:37:28	55.56346483	-9.75328217	971.79	15/07/2017 17:10:32	55.5448665	-9.7387915	960.55	877-972	921	6323-6392
478	32	14/07/2017 11:11:48	55.63226017	-9.64690633	1368.13	14/07/2017 14:17:08	55.6550575	-9.63403167	1310.66	1284-1440	1361	6052-6101
481	33	15/07/2017 07:24:29	55.56454217	-9.58871417	964.82	15/07/2017 09:39:00	55.58253483	-9.57654767	684.47	684-965	844	6203-6320
476	34	13/07/2017 23:05:15	55.799816	-9.432082	851.93	14/07/2017 01:04:42	55.80733483	-9.41150967	682.58	682-852	762	6003-6040
474	35	13/07/2017 09:45:33	55.96163567	-9.38106733	976.76	13/07/2017 12:18:46	55.97998633	-9.39649267	957.97	916-1004	966	5903-5988
472	36	11/07/2017 10:58:49	55.15482	-10.28688017	1608.35	11/07/2017 14:19:15	55.17636	-10.293517	1477.71	1458-1628	1544	5593-5735
471	37	11/07/2017 04:57:47	55.06697717	-10.42723383	1943.6	11/07/2017 06:54:45	55.08927933	-10.42885183	1730.22	1728-1947	1851	5584-5588
468	38	10/07/2017 10:37:54	54.585098	-10.781528	2248.34	10/07/2017 12:18:27	54.87181783	-10.7814248	2008.91	1913-2247	2148	5462-5495
465	39	09/07/2017 11:58:38	54.562437	-11.45436883	2460.28	09/07/2017 13:42:56	54.5719103	-11.44817157	2232.28	2211-2466	2394	4878-4925
490	40	18/07/2017 18:46:48	54.42672533	-11.332851	728.03	18/07/2017 21:24:03	54.41913717	-11.33948283	627.48	545-728	640	7868-8037
496	41	20/07/2017 20:50:02	54.0673328	-12.6434508	1701.28	20/07/2017 22:19:16	54.0727655	-12.656747	1420.08	1413-1869	1695	8713-9038
457	42	07/07/2017 05:36:27	53.96740717	-12.57751183	628.88	07/07/2017 07:31:53	53.964806	-12.569044	534.07	472-629	526	3638-3855
458	43	07/07/2017 11:01:46	54.11368017	-12.46106667	1974.97	07/07/2017 13:58:43	54.12527833	-12.47902533	1667.61	1668-1975	1850	3857-3900
491	45	19/07/2017 00:38:24	54.2650395	-11.576984	934.91	19/07/2017 04:11:31	54.2555208	-11.5849407	727.35	727-935	815	8038-8149
475	46	13/07/2017 16:29:09	56.21451533	-9.47474433	1195.16	13/07/2017 17:48:56	56.20587283	-9.48184367	1184.18	1184-1195	1190	5990-6002
477	47	14/07/2017 04:51:45	55.76937233	-9.6996885	1699.47	14/07/2017 07:01:07	55.77423467	-9.67514517	1579.23	1578-1700	1647	6041-6049
479	48	14/07/2017 22:23:20	55.65276367	-9.60503167	1058.26	15/07/2017 00:23:32	55.64582633	-9.57967633	944.46	944-1058	996	6102-6194
480	49	15/07/2017 02:51:52	55.65270567	-9.50526133	790.78	15/07/2017 04:48:28	55.635942	-9.51434317	584.29	584-791	666	6195-6199
492	50	19/07/2017 08:58:08	54.0280875	-12.225441	632.48	19/07/2017 11:40:42	54.01507317	-12.22348633	470.75	463-657	552	8153-8337
493	51	19/07/2017 19:25:04	54.066917	-11.98381533	510.97	19/07/2017 21:29:17	54.06629317	-11.9778465	503.45	502-570	532	8338-8486
497	52	21/07/2017 03:00:35	54.0544575	-12.51120667	1107.21	21/07/2017 05:55:57	54.07124667	-12.52291683	878.74	879-1107	1054	9039-9174

Table 6 Summary descriptions and reef data per dive. Number of species and percentage reef are both colour coded so that darker colour highlights higher species richness or reef percentages.

Dive	Transect	Average depth (m)	Number of Species	Summary	% Reef	% Geogenic	% Biogenic	Quality of Biogenic Reef
449	1	1029	82	Coral garden, fairly diverse	37%	37%	20%	Dead - but rubble apron
450	2	717	56	Large biogenic Lophelia reef and carbonate mounds	95%	95%	n/a	Healthy
451	3	704	60	Lophelia on rock, small biogenic reef, carbonate mound	90%	88%	2%	Healthy
452	4	710	53	Limited geogenic reef with some discrete scleractinians & hydrozoan corals	28%	28%	n/a	n/a
453	5	2117	77	Deep sponge and coral aggregation, unusual fauna, Elasmobranch egg cases	75%	75%	n/a	n/a
454	6	1676	81	Epifaunally rich mixed sediment and Stichopathes dominated boulders	58%	58%	n/a	n/a
495	8	2191	65	Gravel veneered mud with echinoids/ holothurians, cobbles/boulders and bedrock cliffs (different colours/textures) with stalked crinoids, mixed sponges, and Chrysogorgiids	60%	60%	n/a	n/a
455	9	2645	34	Holothurians and holasteroid urchins	n/a	n/a	n/a	n/a
456	10	1397	79	Sparse seapens, lots of fish (inc juvenile Roughy), short time on bedrock escarpment	35%	35%	n/a	n/a
494	11	2205	61	Area of dense pteropod hash, mud with sparse sea pens, carbonate cliffs with mixed sponges and Chrysogorgiids corals (and black fossil stalked crinoid anchor points), thin veneered carbonate with stalked crinoids	20%	20%	n/a	n/a
459	12	1528	74	Valley with corals on downslope and upslope escarpments, xenophyophores between	55%	55%	10%	Dead - but rubble apron
460	13	1404	101	Xenophyophores and bedrock cliffs with discrete Solenosimilia colonies and sparse mixed corals/sponges	58%	58%	n/a	n/a
461	14	1644	90	Xenophyophores, rich mixed corals on escarpment, healthy diverse Solenosimilia reef	65%	42%	31%	Healthy
462	15	2000	56	Sparse seapens on rippled sediment, then mixed corals on cobbles/boulders, Acanella upper slope	37%	37%	n/a	n/a
463	16	2023	77	Steep carbonate and cobbles/boulders with stalked crinoids/mixed corals, patchy xenophyophores/sea pens	41%	41%	n/a	n/a
464A	17	1697	91	Epifaunally diverse sediment (cup corals, xenophyophores) on terraces between bedrock outcroppings with Solenosimilia and mixed corals. Some areas of cobble/boulders and veneered carboante with mixed corals.	40%	40%	n/a	n/a
464B	18	1103	69	Orange roughy aggregation over cobble.boulder/bedrock with encrusting and lamellate sponges and mixed corals. Mound summit trawled, some intact dead Lophelia in depressions, many juvenile eels and sharks present	73%	51%	22%	Dead - possibly both climate & trawling
489	19	706	63	Mostly mud (sparse epifauna/urchins), Psolus encrusted cobbles/boulders, and carbonate terraces, some Lophelia colonies and escarpment community on overhangs, encrustin globose sponge patches	53%	53%	n/a	n/a
488	20	1193	137	Very diverse. Extensive coral garden mostly on cobbles/boulders, but also pinnacle/cliff features with Solenosimilia reef/rubble aprons at the base. Sediment also diverse (xenophyophores, cup corals, Acanella)	72%	72%	19%	Dead - but rubble apron
466	21	1975	61	Cup corals, then carbonate with stalked crinoids and chrysogorgiids, then acanella/sea pens on rippled sediment	20%	20%	n/a	n/a
467	22	2115	70	Holothurians and echinoids, carbonate with stalked crinoids and chrysogorgiids, mud and seapens with democrinus Upper slope Democrinus, Acanella and Radicipes of gracilis	12%	12%	n/a	n/a
469	23	1961	60	Burrowed mud and Democrinus and Radicipes cf gracilis, small areas of carbonate or pebbles hosting corals (especially Chrysogorgiids)	9%	9%	n/a	n/a
470	24	2208	31	Entirely mud although depressions and gullies visible, sparse sea pens, juvenile holothurian aggregation	n/a	n/a	n/a	n/a
487	25	1333	104	Epifaunally diverse sediment (xenophyophores, cup corals, Acanella, urchins), carbonate shelves with mixed corals, cobble patches with barnacles, and Solenosimilia reef with clearly trawled areas and some healthy patches	40%	21%	18%	Both healthy and trawled
473	26	926	70	Epifaunally rich sediment (Cup corals, Acanella, xenophyophores, mixed burrowing anemones, & echinoids), a pink echinoid aggregation, pebbles/cobbles with trawl marks	6%	6%	n/a	n/a
485	27	1890	52	Two areas with sparsely colonised carboante cliffs, the rest is mud with thin sea pens/urchins. Large bundled fishing net encountered.	<19%	<19%	n/a	n/a
486	28	1582	32	Sloping mud with Phormosoma placenta urchins, juvenile holothurian aggregation	n/a	n/a	n/a	n/a
483A	29	1315	118	Bedrock cliffs with Solenosimilia colonies, terraced carbonate cliffs and mixed corals, areas of sloping bedrock with a rich sponge aggregation (Aphrocallistes beatrix)	72%	72%	n/a	n/a
483B	30	1422	79	Very strange carbonate features (pinnacles, gullies) arising from mud plane. Juvenile holothurian aggregation, patchy xenophyophores, cobble patches with barnacles.	12%	12%	n/a	n/a
482	31	921	37	Dense pebbles/gravel overlaying mud throughout, and many trawl marks, areas of dense barnacles	100%	100%	n/a	n/a
478	32	1361	55	Xenophyophores, small rubble mounds with orange anemones, small patch of pebbles/cobbles and barnacles, lots of fish.	<1%	<1%	n/a	n/a
481	33	844	54	Dense xenophyophores, areas of sea pens and burrowing anemones or echinoids. Many trawl marks.	n/a	n/a	n/a	n/a
476	34	762	38	sand with patches of pebbles, urchins dominate, dropstones in depressions with a Bolocera & a fish each	n/a	n/a	n/a	n/a
474	35	966	58	Mixed burrowing anemones, acanella, pebbles/cobbles present in a couple of patches but urchins are dominant	22%	22%	n/a	n/a
472	36	1544	84	Xenophyophores common on soft/mixed (gravel) sediments, large healthy Solenosimilia variabilis reef	35%	16%	19%	Healthy
471	37	1851	43	Mud or mud veneered cobble/boulders, rare corals, mostly urchins and holothurians, anther juvenile holothurian aggregation.	6%	6%	n/a	n/a
468	38	2148	44	Sparse epifauna on mud, juvenile holothurian aggregations, small carbonate/cobble patches with corals	7%	7%	n/a	n/a
465	39	2394	35	Mostly mud with urchins/holothurians, areas of sloping carbonate with stalked crinoids and Chrysogorgiids	12%	12%	n/a	n/a
490	40	640	53	Psolus encrusted cobble/boulders, rock ledges, track along one for half dive, some Desmophyllum cf dianthus on overhangs and fossil burrows evident.	67%	67%	n/a	n/a
496	41	1695	107	Mixed sloping/vertical rock types with stalked crinoids and mature erect corals, some giant boulders/bedrock protrusions with Solenosimilia colonies and rubble aprons.	58%	53%	5%	Dead - but rubble apron
457	42	526	62	Hydrozoan corals/Bryozoans (Reteperaturella) on cobble/boulder reef, and outcroppings with escarpment (Desmophyllum/Lophelia) fauna, area of dense unknown yellow anthozoans, encrusting/globose sponge patch	88%	88%	n/a	n/a
458	43	1850	75	Mainly cobbles/boulders frequent corals, Solenosimilia variabilis reef	100%	82%	18%	Healthy
491	45	815	85	Carbonate and cobble/boulder reefs, mixed corals present including many large Leiopathes, Reteperaturella bryozoans also abundant. Some dense patches of brachiopods on sloping carbonate.	87%	81%	5%	Dead - but rubble apron
475	46	1190	44	Mud with patchy xenophyophores, some Acanella/ Ceiranthids/ Hyalonema	n/a	n/a	n/a	n/a
477	47	1647	44	Rippled sand/mud, holes/burrows, lamellate fleshy sponges and barnacles on sparse pebbles. Some Acanella.	n/a	n/a	n/a	n/a
479	48	996	59	Dense xenophyophores, heavily mud veneered ledges and slopes, and dense seapens (Pennatula aculeata)	n/a	n/a	n/a	n/a
480	49	666	35	Rippled sand/mud with burrowing anemones, small area with mixed substrate (gravel/pebbles) and trawl marks	n/a	n/a	n/a	n/a
492	50	552	67	Hydrozoan/bryozoan community on cobbles/boulders/bedrock, some escarpment Desmophyllum/Lophelia community on overhangs, area of dense unknown yellow anthozoans (octocorals?), encrusting/globose sponge patch	63%	63%	n/a	n/a
493	51	532	56	Hydrozoan/bryozoan community on cobbles/boulders/bedrock/broken bedrock, Desmophyllum on overhangs, encrusting/globose sponge patch	88%	88%	n/a	n/a
497	52	1054	72	Extensive dead Lophelia carbonate mound with trawled though probably naturally dead reefs. Small patches with mature Jasonisis sp present.	38%	21%	32%	Dead - possibly both climate & trawling

Table 7 Additional information on planned targets, samples collected, pressures observes, and notes per dive (1 of 2).

Dive	Transect	Average depth (m)	Target Feature(s)	Associated Canyon	Samples	Pressures	Note
449	1	1029	canyon, escarpment	C14 (SAC)	n/a	4 x plastic	
450	2	717	carbonate mounds	W of C14 (SAC)	8x Cidaris cidaris, 6 x Lophelia pertusa	5 x plastic, 1 x full rubbish bag, 3 rope/ fishing gear, 1 x area of possible trawl damaged reef	
451	3	704	carbonate mounds	S of C13 (SAC)	n/a	3 x plastic, 1 x fabric?	
452	4	710	escarpment	SE of C13 (SAC)	2x Push cores, ~10x Cidaris cidaris, 6x Lophelia pertusa, 2x Madrepora oculata	3 x ropes, 4 x fishing nets, 1 x plastic	
453	5	2117	carbonate mound	NW of C12	1x Geodia, 1x Bubble sponge, 1x Keratoisis, 1x Zoanthidea	n/a	
454	6	1676	canyon, escarpment	C12	n/a	1 x rubber/plastic	
455	9	2645	canyon, escarpment	C10	1x Holasteroida sp	n/a	
456	10	1397	canyon, escarpment	C10	2 x pushcores	1 x furrows (trawl marks?), 4 x plastic	
457	42	526	escarpment	E of C10	n/a	7 x fishing lines, 1 x net	On bottom from 04:30:42 but filming ROV with gopro. Time and location logged is start of HD video
458	43	1850	canyon, escarpment	C9	2 x pushcores, 1 x barnacle gravel, 1 x sponge, 1 x Solenosmilia	n/a	
459	12	1528	canyon, escarpment	C9	2 x pushcores	n/a	
460	13	1404	canyon, escarpment	C8	n/a	1 x plastic	
461	14	1644	canyon, escarpment	C8	n/a	1 x plastic	Failed HD recording on first 30mins of dive, composite video present
462	15	2000	canyon, escarpment	C8	2 x pushcores	1 x plastic	
463	16	2023	canyon, escarpment	C7	1 x Anthoptilum, 2 x pushcores	2 x plastic (inc DHL)	
464A	17	1697	canyon, escarpment	C7	n/a	3 x metal, 1 x rope, 1 x plastic	
464B	18	1103	carbonate mound	NW of C7	n/a	probably trawled (fine grain rubble) but no marks	
465	39	2394	canyon, escarpment	N of C7	n/a	n/a	
466	21	1975	canyon, escarpment	C6	2 x pushcores	n/a	
467	22	2115	canyon, escarpment	C6	1 x seapen (Halipteris?), 2 x pushcores, 1 x chrysogorgiidae, 1 x Radicipes.	1 x plastic	Transect split into two halves, pulling off bottom with transit in blue water to upper slope for second half
468	38	2148	canyon, escarpment	C6	2 x pushcores	1 x fishing net, 1 x plastic	
469	23	1961	canyon, escarpment	C5	2 x pushcores	7 x plastic	
470	24	2208	canyon	C4	n/a	1 x plastic	
471	37	1851	canyon, escarpment	C4	n/a	4 x plastic, 2 x metal	
472	36	1544	canyon, escarpment	C6	3x pushcores, 1x sponge, 1x isididae	2 x plastic	
473	26	926	canyon, escarpment	C4	5x Cidaris cidaris	3 x plastic, 1 x fishing line, 5 x trawl marks	
474	35	966	unidentified	N of C1	2 x pushcores	1 x plastic, 1 x net	Notice image numbers from here overlap with previous but are different images
475	46	1190	Pheronema model groundtruthing		2 x pushcores	1 x plastic	
476	34	762	canyon, escarpment	N of C1	2 x Parastichopus tremulus	2 x plastic, 2 x fishing cable, 2 x fishing line	
477	47	1647	unknown	north of C1	2 x lamellate fleshy sponges, 1 x Umbellula, 2 x pushcores	n/a	
478	32	1361	canyon, escarpment	C1	2 x pushcores	24 x plastic, 4 x fishing lines, 2 x nets, 2 x fabric	
479	48	996	escarpment	C1	1 x Halipteris sp	17 x trawl marks, 2 x plastic, 9 x fishing lines, 1 x drinks can	
480	49	666	Lophelia reef model groundtruthing	E of C1	2 x pushcores	10 x trawl marks, 1 x fishing line	
481	33	844	canyon, escarpment	C1	1 x sea pen, 1 x pushcore	24 x trawl marks, 1 x fishing line, 1 x rope	
482	31	921	canyon, escarpment	C1	2 x pushcores	>64 x trawl marks, 1 x glass bottle, 2 x plastic	
483A	29	1315	canyon, escarpment, carbonate mound	C2	2x Solenosmilia variabilis, 1x lamellate sponge, 2x Aphrocallistes	2 x fishing gear, 5 x fishing line	End time reflects navigation, HD video ends 2 mins later, same spot.

Table 8 Additional information on planned targets, samples collected, pressures observes, and notes per dive (2 of 2).

Dive	Transect	Average depth (m)	Target Feature(s)	Associated Canyon	Samples	Pressures	Note
483B	30	1422	canyon, escarpment	C2	n/a	4 x fishing gear, 5 x plastic, 1 x trawl mark, 1 x metal.	
485	27	1890	canyon	C3	1 x Phormosoma, 1 x Pennatulacea, 1 x Pushcore	n/a	Recodeder as <19% geogenic reef as descended back past already surveyed carbonate at start, probably closer to 17%
486	28	1582	canyon	C3	1 x pushcore	1 x rope/net	
487	25	1333	canyon, escarpment	C4	1x Porifera lamellate sp 12 (OTU1010), 1x pushcore	8 x plastic, 2 x fishing line, 10 x trawl marks	
488	20	1193	canyon, escarpment	C6	3 x sponges, 1x pushcore	2 x plastic, 2 x fishing line, 1 x metal, 1 x wood.	
489	19	706	escarpment	between C6 and C7	n/a	5 x plastic, 1 x fishing line	Depth range compiled from both USBL and CTD
490	40	640	escarpment	E of C7	1 x pushcore	6 x fishing nets, 1 x fishing line, 1 x plastic	Depth range compiled from both USBL and CTD
491	45	815	carbonate mound, escarpment	C7	3 x Cidaris, 4 x Lophelia, 1 x Drifa, 1 x Madrepora, 2 x pushcores	1 x plastic, 1 x fishing net	
492	50	552	escarpment	S of C9	1 x Lophelia pertusa, 1 x Pushcore	10 x fishing line, 1 x plastic, 1 x net	
493	51	532	escarpment	S of C8	n/a	7 x fishing line, 3 x fishing gear, 1 x fabric	
494	11	2205	canyon, escarpment	C9	2 x pushcores	1 x fishing line	
495	8	2191	canyon, escarpment	C10	5 x sponges (various)	1 x trawl mark	
496	41	1695	canyon, escarpment	C10	1 x cf Geodia baretii (OTU601)	2 x plastic, 1 x fishing line	
497	52	1054	Carbonate mound (<i>Pheronema carpenteri</i> aggregations/ Scleractinian Reef)	Between C9/C10	3 x Sponges (inc. <i>Pheronema carpenteri</i>), 1 x <i>Madrepora oculata</i>	1 x glass bottle, 3 x trawl marks, 1 x carpet?	GoPro ROV beauty shots prior to start of HD video

Table 9 Listed species and habitats per dive (1 of 3).

Dive	Transect	Average depth (m)	Listed Species	Listed Habitats
449	1	1029	7 Orange Roughy (<i>Hoplostethus atlanticus</i>)	Coral Gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral Gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops Coral Gardens: (sparse) Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens Deep Sea Sponge Aggregations: Hard-bottom sponge aggregation
450	2	717	n/a	Carbonate mound Lophelia pertusa reef Cold-water coral reef: Lophelia pertusa/Madrepora oculata reef
451	3	704	n/a	Carbonate mound Lophelia pertusa reef Cold-water coral reef: Lophelia pertusa/Madrepora oculata reef Coral Gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops
452	4	710	n/a	Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops Coral gardens: Hard-bottom coral garden: Stylerid corals on hard substrata
453	5	2117	n/a	Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Deep-sea sponge aggregations: Hard-bottom sponge aggregations Mud and sand emergent fauna Sea-pen and burrowing megafauna communities Seapen fields
454	6	1676	3 Orange Roughy (<i>Hoplostethus atlanticus</i>)	Coral Gardens: Hard bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral Gardens: Hard bottom coral garden: Colonial scleractinians on rocky outcrops Coral Gardens: Soft-bottom coral garden: Cup-corals fields Mud and sand emergent fauna Sea-pen and burrowing megafauna communities Seapen fields
455	9	2645	n/a	n/a
456	10	1397	39 Orange Roughy (<i>Hoplostethus atlanticus</i>)	Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Sea-pen and burrowing megafauna communities Seapen fields
457	42	526	n/a	Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops Coral gardens: Hard-bottom coral garden: Gorgonian and black coral gardens Coral gardens: Hard-bottom coral garden: Stylerid corals on hard substrata Deep-sea sponge aggregations: Hard-bottom sponge aggregations
458	43	1850	n/a	Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (<i>Solenosmilia variabilis</i> variant of) Lophelia pertusa reefs Cold-water coral reef: <i>Solenosmilia variabilis</i> reef
459	12	1528	7 Orange Roughy (<i>Hoplostethus atlanticus</i>)	(<i>Solenosmilia variabilis</i> variant of) Lophelia pertusa reefs Cold-water coral reef: <i>Solenosmilia variabilis</i> reef Mud and sand emergent fauna Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops
460	13	1404	9 Orange Roughy (<i>Hoplostethus atlanticus</i>)	Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Hard-bottom coral garden: Soft-bottom coral garden: Cup-corals fields Mud and sand emergent fauna
461	14	1644	n/a	Mud and sand emergent fauna Sea-pen and burrowing megafauna communities Seapen fields (<i>Solenosmilia variabilis</i> variant of) Lophelia pertusa reefs Cold-water coral reef: <i>Solenosmilia variabilis</i> reef Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops
462	15	2000	n/a	Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens Sea-pen and burrowing megafauna communities Seapen fields
463	16	2023	n/a	Sea-pen and burrowing megafauna communities Seapen fields Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Mud and sand emergent fauna
464A	17	1697	1 Orange Roughy (<i>Hoplostethus atlanticus</i>)	Mud and sand emergent fauna Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops Coral gardens: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
464B	18	1103	257 Orange Roughy (<i>Hoplostethus atlanticus</i>) 1 Leafscale Gulper Shark (<i>Centrophorus squamosus</i>)	Mud and sand emergent fauna Deep-sea sponge aggregations: Hard-bottom sponge aggregations
465	39	2394	n/a	Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens Sea-pen and burrowing megafauna communities Seapen fields Mud and sand emergent fauna
466	21	1975	n/a	Sea-pen and burrowing megafauna communities Seapen fields Coral gardens: Soft-bottom coral garden: Cup-corals fields Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens

Table 10 Listed species and habitats per dive (2 of 3).

Dive	Transect	Average depth (m)	Listed Species	Listed Habitats
467	22	2115	n/a	Mud and sand emergent fauna Sea-pen and burrowing megafauna communities Seapen fields Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens
468	38	2148	n/a	Mud and sand emergent fauna (sparse) Sea-pen and burrowing megafauna communities (sparse) Seapen fields Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens
469	23	1961	n/a	Mud and sand emergent fauna Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens
470	24	2208	n/a	(sparse) Sea-pen and burrowing megafauna communities (sparse) Seapen fields
471	37	1851	n/a	n/a
472	36	1544	5 Orange Roughy (<i>Hoplostethus atlanticus</i>)	Mud and sand emergent fauna (ICES) (<i>Solenosmilia variabilis</i> variant of) <i>Lophelia pertusa</i> reefs Cold-water coral reef: <i>Solenosmilia variabilis</i> reef Coral gardens: Soft-bottom coral garden: Cup-coral fields Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens
473	26	926	n/a	Coral gardens: Soft-bottom coral garden: Cup-coral fields Mud and sand emergent fauna
474	35	966	n/a	Mud and sand emergent fauna Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens
475	46	1190	n/a	Mud and sand emergent fauna
476	34	762	n/a	n/a
477	47	1647	n/a	Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens
478	32	1361	15 Orange Roughy (<i>Hoplostethus atlanticus</i>)	Mud and sand emergent fauna Anemone aggregations: Soft-bottom anemone aggregations
479	48	996	1 Leafscale Gulper Shark (<i>Centrophorus squamosus</i>)	Sea-pen and burrowing megafauna communities Seapen fields Mud and sand emergent fauna
480	49	666	n/a	Anemone aggregations: Soft-bottom anemone aggregations
481	33	844	1 Leafscale Gulper Shark (<i>Centrophorus squamosus</i>)	Mud and sand emergent fauna Sea-pen and burrowing megafauna communities Seapen fields
482	31	921	6 Leafscale Gulper Shark (<i>Centrophorus squamosus</i>)	n/a
483A	29	1315	21 Orange Roughy (<i>Hoplostethus atlanticus</i>) - juveniles	Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops Coral gardens: Hard-bottom coral garden: Stylerid corals on hard substrata Coral gardens: Soft-bottom coral garden: Cup-coral fields Coral gardens: Soft-bottom coral garden: (Soft-bottom gorgonian and black coral gardens) Deep-sea sponge aggregations: Hard-bottom sponge aggregations Mud and sand emergent fauna
483B	30	1422	22 Orange Roughy (<i>Hoplostethus atlanticus</i>) - juveniles	Mud and sand emergent fauna Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Soft-bottom coral garden: Cup-coral fields
485	27	1890	n/a	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES) (too sparse?) Coral gardens (too sparse?) Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens
486	28	1582	n/a	n/a
487	25	1333	1 Orange Roughy (<i>Hoplostethus atlanticus</i>)	(<i>Solenosmilia variabilis</i> variant of) <i>Lophelia pertusa</i> reefs Cold-water coral reef: <i>Solenosmilia variabilis</i> reef Mud and sand emergent fauna Coral gardens: Soft-bottom gorgonian and black coral gardens: Soft-bottom coral garden: Cup-coral fields Coral gardens: Soft-bottom gorgonian and black coral gardens: Soft-bottom gorgonian and black coral gardens
488	20	1193	1 Orange Roughy (<i>Hoplostethus atlanticus</i>) 1 Leafscale Gulper Shark (<i>Centrophorus squamosus</i>)	(<i>Solenosmilia variabilis</i> variant of) <i>Lophelia pertusa</i> reefs Cold-water coral reef: <i>Solenosmilia variabilis</i> reef Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops Coral gardens: Soft-bottom coral garden: Cup-coral fields Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens Mud and sand emergent fauna
489	19	706	1 Leafscale Gulper Shark (<i>Centrophorus squamosus</i>)	n/a
490	40	640	n/a	n/a
491	45	815	2 Leafscale Gulper Shark (<i>Centrophorus squamosus</i>)	Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens

Table 11 Listed species and habitats per dive (part 3 of 3).

Dive	Transect	Average depth (m)	Listed Species	Listed Habitats
492	50	552	1 Leafscale Gulper Shark (<i>Centrophorus squamosus</i>)	Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Hard-bottom coral garden: Non-reefal scleractinian aggregations Coral gardens: Hard-bottom coral garden: Stylerid corals on hard substrata
493	51	532	n/a	Coral gardens: Hard-bottom coral garden: Non-reefal scleractinian aggregations Coral gardens: Hard-bottom coral garden: Stylerid corals on hard substrata Deep-sea sponge aggregations: Hard-bottom sponge aggregations
494	11	2205	n/a	Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Mud and sand emergent fauna
495	8	2191	n/a	Deep-sea sponge aggregations: Hard-bottom sponge aggregations Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens
496	41	1695	52 Orange Roughy (<i>Hoplostethus atlanticus</i>) - juveniles	Coral gardens: Hard-bottom coral garden: Colonial scleractinians on rocky outcrops Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens Sea-pen and burrowing megafauna communities Seapen fields
497	52	1054	6 Orange Roughy (<i>Hoplostethus atlanticus</i>)	Coral gardens: Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens Coral gardens: Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens Mud and sand emergent fauna

Table 12 List of variant biotopes (with reference to the deep sea section of the Marine Habitat Classification for Britain and Ireland (v.15.03)) encountered and the transects where they were found. Colour coded for depth zones. Variants highlighted in red are potential new biotopes of note.

List of Biotopes observed	Variant?	Depth Variant	Sediment Variant	Species/Other Variant	Variant details	(parent) biotope descriptor	Transects
(var) M.AtLB.Mu.EreCor	Yes	Y			upper abyssal	(variant of) Erect coral field on Atlantic lower bathyal mud	22
(var) M.AtLB.Mu.EreCor.AcaArb	Yes	Y			upper abyssal	(variant of) Acanella arbustula assemblage on Atlantic lower bathyal mud	9, 39
(var) M.AtLB.Mu.UrcCom	Yes	Y			upper abyssal	(variant of) Urchin dominated community on Atlantic lower bathyal mud	16
(var) M.AtLB.Mu.UrcCom	Yes	Y			mid abyssal	(variant of) Urchin dominated community on Atlantic lower bathyal mud	9
(var) M.AtLB.Mx.SurOph.OphCer	Yes	Y			upper abyssal	(variant of) Ophiomuseum lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	39
(var) M.AtLB.Mx.SurOph.OphCer	Yes			Y	lacking cerianthids	(variant of) Ophiomuseum lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	23, 43
(var) M.AtLB.Mx.XenCoM.SyrFra	Yes	Y			upper abyssal	(variant of) Syringammina fragilissima field on Atlantic lower bathyal mixed sediment	5
(var) M.AtLB.Ro	Yes			Y	with stalked crinoids and sponges	(variant of) Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	41
(var) M.AtLB.Ro.MixCor	yes	Y			upper abyssal	(var) Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	38
(var) M.AtMB.Co.UrcCom	Yes		Y		mixed sediment	(variant of) Urchin dominated community on Atlantic mid bathyal coarse sediment	31
(var) M.AtMB.Mu.BurAne	Yes	Y			lower bathyal	(variant of) Burrowing anemone field in Atlantic mid bathyal mud	26, 33
(var) M.AtMB.Mu.BurAne	Yes		Y		mixed sediment	(variant of) Burrowing anemone field in Atlantic mid bathyal mud	49
(var) M.AtMB.Mu.BurAne.CerAne	Yes	Y			lower bathyal	(variant of) Cerianthid anemones and burrowing megafauna in Atlantic mid bathyal mud	32
(var) M.AtMB.Mu.CriCom	Yes	Y	Y		lower bathyal, stalked	(variant of) Crinoid dominated community on Atlantic mid bathyal mud	11, 23
(var) M.AtMB.Mu.CriCom	Yes	Y	Y		upper abyssal, stalked	(variant of) Crinoid dominated community on Atlantic mid bathyal mud	22, 38, 39
(var) M.AtMB.Mu.EreCor.AcaArb	Yes		Y		coarse sediment	(variant of) Acanella arbustula assemblage on Atlantic mid bathyal mud	1
(var) M.AtMB.Mu.EreCor.AcaArb	Yes		Y		mixed sediment	(variant of) Acanella arbustula assemblage on Atlantic mid bathyal mud	52
(var) M.AtMB.Mu.SpnMeg	Yes	Y	Y		lower bathyal, mixed substrate	(variant of) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	15
(var) M.AtMB.Mu.SpnMeg	Yes	Y			lower bathyal	(variant of) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	6, 16, 21, 33, 41, 10, 24, 27
(var) M.AtMB.Mu.SpnMeg	Yes	Y	Y		lower bathyal, sand	(variant of) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	14
(var) M.AtMB.Mu.SpnMeg	Yes	Y			upper abyssal	(variant of) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	22, 38, 39
(var) M.AtMB.Mu.SpnMeg	Yes	Y	Y		upper abyssal, coarse sediment	(variant of) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	5
(var) M.AtMB.Mu.UrcCom	Yes		Y		mixed sediment	(variant of) Urchin dominated community on Atlantic mid bathyal mud	35
(var) M.AtMB.Ro.BarCom	Yes	Y			lower bathyal	(variant of) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	17, 25, 6, 26, 29, 30, 32, 36, 47
(var) M.AtMB.Ro.BraCom	Yes		Y		coarse sediment	(variant of) Brachiopod dominated community on Atlantic mid bathyal rock and other hard substrata	2
(var) M.AtMB.Ro.MixCor.DisLop	Yes		Y	canyon/escarpment, Desmophyllum characteristic		(variant of) Discrete Lophelia pertusa colonies on Atlantic mid bathyal rock and other hard substrata	42, 50
(var) M.AtMB.Ro.SpaEnc	Yes	Y			lower bathyal	(variant of) Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata	17, 13, 26, 27, 29
(var) M.AtMB.Ro.SpaEnc.PsoAno	Yes	Y			lower bathyal	(variant of) Psolus squamatus, Anomiidae, serpulid polychaetes and Munida on Atlantic mid bathyal rock and other hard substrata	19, 20
(var) M.AtMB.Sa.BurAne	Yes		Y		coarse sediment	(variant of) Burrowing anemone field in Atlantic mid bathyal sand	2
(var) M.AtMB.Sa.BurAne	Yes	Y			lower bathyal	(variant of) Burrowing anemone field in Atlantic mid bathyal sand	26, 35
(var) M.AtMB.Sa.UrcCom.CidUrc	Yes		Y		mixed sediment	(variant of) Cidarid urchin assemblage on Atlantic mid bathyal sand	45
(var) M.AtUA.Mu.HolCom	Yes	Y			lower bathyal	(variant of) Holothurian dominated community on Atlantic upper abyssal mud	24, 28, 29, 30, 36, 37
(var) M.AtUA.Mu.HolCom	Yes		Y		mixed sediment	(variant of) Holothurian dominated community on Atlantic upper abyssal mud	8
(var) M.AtUA.Mu.UrcCom	Yes		Y		mixed sediment	(variant of) Urchin dominated community on Atlantic upper abyssal mud	8
(var) M.AtUA.Ro	Yes		Y	with stalked crinoids and sponges		(variant of) Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	5, 8, 16, 22, 39, 41
(var) M.AtUB.Ro.BarCom	Yes	Y			lower bathyal	(variant of) Barnacle dominated community on Atlantic upper bathyal rock and other hard substrata	18
(var) M.AtUB.Ro.DeeSpo	Yes		Y		encrusting	(variant of) Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	51
(var) M.AtUB.Ro.DeeSpo	Yes	Y			lower bathyal	(variant of) Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	18
(var) M.AtUB.Ro.DeeSpo	Yes	Y			mid bathyal	(variant of) Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	1, 42, 52
(var) M.AtUB.Ro.DeeSpo.SpoSty	Yes	Y			lower bathyal	(variant of) Lobose sponge and stylasterid assemblage on Atlantic upper bathyal rock and other hard substrata	29
(var) M.AtUB.Ro.MixCor	Yes		Y	canyon/escarpment, Desmophyllum characteristic		(variant of) Mixed cold water coral community on Atlantic upper bathyal rock and other hard substrata	19, 50, 51
(var) M.AtUB.Ro.SpaEnc.(HydBry)	Yes		Y	dominated by Hydrozoans and Bryozoans		(variant of) Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata	50, 51

Table 13 List of biotopes encountered that are currently listed in the Marine Habitat Classification for Britain and Ireland (v.15.3) Colour coded for depth zones.

List of Biotopes observed	Biotope descriptor	Transects
M.ATLB.Bi.CorRee	Atlantic lower bathyal cold water coral reef (biogenic structure) DEAD SOLENOSMILIA	14
M.ATLB.Bi.CorRee.SolFra	Mixed coral assemblage on Atlantic lower bathyal Solenosmilia reef framework (biogenic structure)	12, 14, 20, 36
M.ATLB.Bi.CorRee.SolVar	Atlantic lower bathyal live Solenosmilia variabilis reef (biogenic structure)	43, 14, 25, 36
M.ATLB.Co	Atlantic lower bathyal coarse sediment	18, 25, 41
M.ATLB.Co.MixCor	Mixed cold water coral community on Atlantic lower bathyal coarse sediment	41
M.ATLB.Co.MixCor.DisSol	Discrete Solenosmilia variabilis colonies on Atlantic lower bathyal coarse sediment	43
M.ATLB.Co.SolSci	Solitary scleractinian field on Atlantic lower bathyal coarse sediment	13
M.ATLB.Co.XenCoM.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal coarse sediment	17
M.ATLB.Mu	Atlantic lower bathyal mud	24, 37, 41, 47
M.ATLB.Mu.EreCor	Erect coral field on Atlantic lower bathyal mud	23
M.ATLB.Mu.EreCor.AcaArb	Acanella arbicularia assemblage on Atlantic lower bathyal mud	15, 20, 25, 41, 47
M.ATLB.Mu.SolSci	Solitary scleractinian field on Atlantic lower bathyal mud	6, 20, 21, 25, 26, 29, 30
M.ATLB.Mu.UrcCom	Urchin dominated community on Atlantic lower bathyal mud	21, 22, 23, 27, 28, 37
M.ATLB.Mu.UrcCom.GraAcu	Gracilechinus acutus norvegicus assemblage on Atlantic lower bathyal mud	23
M.ATLB.Mu.XenCoM.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mud	13, 26, 29, 30, 33, 36, 46
M.ATLB.Mx	Atlantic lower bathyal mixed sediment	25, 41
M.ATLB.Mx.SurOph.OphCer	Ophiomorus lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	12, 13, 16, 17, 21, 27, 30, 36, 37, 41
M.ATLB.Mx.XenCoM.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mixed sediment	6, 12, 14, 16, 18, 20, 25, 29, 30, 32
M.ATLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	6, 10, 11, 12, 13, 14, 15, 17, 20, 21, 23, 25, 27, 29, 30, 36, 37, 41, 43
M.ATLB.Ro.MixCor.DisSol	Discrete Solenosmilia variabilis colonies on Atlantic lower bathyal rock and other hard substrata	6, 12, 14, 17, 20, 29, 41
M.ATLB.Sa	Atlantic lower bathyal sand	17
M.ATLB.Sa.SolSci	Solitary scleractinian field on Atlantic lower bathyal sand	11, 17, 36
M.ATLB.Sa.UrcCom	Urchin dominated community on Atlantic lower bathyal sand	20, 26
M.ATMA.Mu.HolCom	Holothurian dominated community on Atlantic mid abyssal mud	9, 39
M.ATMB.Bi.CorRee	Atlantic mid bathyal cold water coral reef (biogenic structure) DEAD LOPHELIA	52
M.ATMB.Bi.CorRee.LopFra	Mixed coral assemblage on Atlantic mid bathyal Lophelia pertusa reef framework (biogenic structure)	1, 45
M.ATMB.Bi.CorRee.LopPer	Atlantic mid bathyal live Lophelia pertusa reef (biogenic structure)	2, 3
M.ATMB.Co	Atlantic mid bathyal coarse sediment	1, 2, 3, 52
M.ATMB.Co.MixCor	Mixed cold water coral community on Atlantic mid bathyal coarse sediment	52
M.ATMB.Co.SpaEnc	Sparse encrusting community on Atlantic mid bathyal coarse sediment	52
M.ATMB.Co.UrcCom	Urchin dominated community on Atlantic mid bathyal coarse sediment	42
M.ATMB.Co.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic mid bathyal coarse sediment	2, 45
M.ATMB.Mu	Atlantic mid bathyal mud	48, 52
M.ATMB.Mu.BurAne	Burrowing anemone field in Atlantic mid bathyal mud	49
M.ATMB.Mu.EreCor.AcaArb	Acanella arbicularia assemblage on Atlantic mid bathyal mud	35
M.ATMB.Mu.SpnMeg	Sea pens and burrowing megafauna on Atlantic mid bathyal mud	11, 48
M.ATMB.Mu.UrcCom	Urchin dominated community on Atlantic mid bathyal mud	35
M.ATMB.Mu.XenCoM.SyrFra	Syringammina fragilissima field on Atlantic mid bathyal mud	48, 52
M.ATMB.Mx	Atlantic mid bathyal mixed sediment	49
M.ATMB.Ro	Atlantic mid bathyal rock and other hard substrata	52
M.ATMB.Ro.BarCom	Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	1, 31
M.ATMB.Ro.BraCom	Brachiopod dominated community on Atlantic mid bathyal rock and other hard substrata	45
M.ATMB.Ro.MixCor	Mixed cold water coral community on Atlantic mid bathyal rock and other hard substrata	1, 4, 45, 52
M.ATMB.Ro.MixCor.DisLop	Discrete Lophelia pertusa colonies on Atlantic mid bathyal rock and other hard substrata	2, 3, 4, 45
M.ATMB.Ro.SpaEnc	Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata	34, 45
M.ATMB.Ro.SpaEnc.PsoAno	Psolus squamatus, Anomiidae, serpulid polychaetes and Munidea on Atlantic mid bathyal rock and other hard substrata	19, 40
M.ATMB.Sa	Atlantic mid bathyal sand	1, 34, 40, 49
M.ATMB.Sa.BurAne	Burrowing anemone field in Atlantic mid bathyal sand	1
M.ATMB.Sa.UrcCom	Urchin dominated community on Atlantic mid bathyal sand	3, 4, 19, 34, 45
M.ATMB.Sa.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic mid bathyal sand	19, 40
M.ATUA.Mu.HolCom	Holothurian dominated community on Atlantic upper abyssal mud	22, 38
M.ATUA.Mu.UrcCom	Urchin dominated community on Atlantic upper abyssal mud	22, 38, 39
M.ATUA.Mx	Atlantic upper abyssal mixed sediment	5
M.ATUB.Co.UrcCom	Urchin dominated community on Atlantic upper bathyal coarse sediment	50, 51
M.ATUB.Mu	Atlantic upper bathyal mud	19
M.ATUB.Ro.MixCor	Mixed cold water coral community on Atlantic upper bathyal rock and other hard substrata	42, 50
M.ATUB.Ro.SpaEnc	Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata	40, 50, 51
M.ATUB.Sa.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic upper bathyal sand	50, 51

Table 14 Species list with operational taxonomic units (OTUs), SACFOR per transect (Rare=blue to Abundant = red), number of transects where observed (darker =more prolific), WoRMS accepted name (bold= variant on analysis ID) and associated AphialD for ease of searching. (1 of 7)

O.T.U	AnalysisName	Phylum	1	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	45	46	47	48	49	50	51	52	#	WoRMSname	Level	AphiaID
585	Acanella arbuscula	Cnidaria	F				F	F	O	O	C	F	F	F	O	F	F	F	O	O	O	O	O	O	O	O	O	F	F	O	O	O	F	F	O	O	F	32	Acanella arbuscula	Species	125371															
608	Acanthogorgia cf armata	Cnidaria	O		R	O		R		O	O		O	O	O	O	O	O	O	O	R		R		R		R		R		R	O	12	Acanthogorgia	Species	125293																				
1062	Acesta excavata	Mollusca			O		R		R		O	O		O	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	7	Acesta excavata	Species	140232												
499	Actinaugae richardi	Cnidaria			R																																										6	Actinaugae richardi	Species	100930						
554	Actinernus sp	Cnidaria			R	A	D		R	R	O	O	R	R	O	O	O	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	Actinernus	Genus	100691												
4	Actinia sp 1	Cnidaria	O	O	O	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	18	Actiniaria	Order	1360													
478	Actinia sp 13 (pink/purple)	Cnidaria	B	O																																											7	Actiniaria	Order	1360						
582	Actiniaria sp 18 (sun)	Cnidaria							R											O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	11	Actiniaria	Order	1360										
605	Actiniaria sp 20	Cnidaria	R	R	O	R	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	41	Actiniaria	Order	1360													
907	Actiniaria sp 24	Cnidaria			R																																										4	Actiniaria	Order	1360						
976	Actiniaria sp 27	Cnidaria	R	R																																											7	Actiniaria	Order	1360						
41	Actiniidae sp (sandBolocera)	Cnidaria	R	R		R														F		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	16	Actiniidae	Family	100653										
930	Actinopterygii sp 3	Chordata	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	32	Actinopterygii	Class	10194													
1006	Actinopterygii sp 4	Chordata	R	R	R																																										12	Actinopterygii	Class	10194						
1047	Actinoscyphidae sp 1 (pink)	Cnidaria	R	I	O	R	O	R	O	O	O	O	O	O	O	O	O	O	O	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	13	Actinoscyphidae	Family	100654													
132	Actinostolidae sp 1	Cnidaria		R	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	21	Actinostolidae	Family	100655													
1066	Adamsia sp (Paguridae Associated)	Cnidaria	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	17	Adamsia	Genus	100751													
1074	Alepocephaliformes sp 1 cf Rouleina attrita	Chordata	R		R															O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	O	17	Alepocephalidae	Family	125507									
1143	Ampheraster alaminos	Echinodermata		R	R																																										2	Ampheraster alaminos	Species	178777						
1031	Anachalyptiscrinus nefertiti	Echinodermata																																													12	Anachalyptiscrinus nefertiti	Species	689479						
32	Anomiidae sp 1	Mollusca	R	O	O																																										5	Anomiidae	Family	214						
278	Anthomastus grandiflorus	Cnidaria	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	35	Anthomastus grandiflorus	Species	125335													
594	Anthoptilum grandiflorum	Cnidaria		O	B																																										11	Anthoptilum grandiflorum	Species	128504						
1120	Anthoptilum sp (darkAxis)	Cnidaria		R	R																																										4	Anthoptilum	Genus	128489						
311	Anthothelia grandiflora	Cnidaria	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	14	Anthothelia grandiflora	Species	125414													
1133	Anthozoa white branching	Cnidaria			R																																										1	Isididae	Family	125276						
592	Antipatharia sp 4 cf Stauropathes	Cnidaria		R																																											8	Antipatharia	Order	22549						
1187	Antipathes dichotoma	Cnidaria	O																																												2	Antipathes dichotoma	Species	103309						
1097	Aphanopus carbo	Chordata																		R	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	5	Aphanopus carbo	Species	127085										
264	Aphrocallistes sp	Porifera	O																	F		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	6	Aphrocallistes	Genus	132099											
146	Aphroditidae sp 1	Annelida	R	I	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	15	Aphroditidae	Family	938														
568	Apristurus cf microps	Chordata																																													2	Apristurus	Genus	105727						
1082	Apristurus profundorum	Chordata																		R																											1	Apristurus profundorum	Species	158513						
1131	Apristurus sp (indet)	Chordata			O	R														F																										6	Apristurus	Genus	105727							
188	Araeosoma fenestratum	Echinodermata	O	F	F															F	O	O	X	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	14	Araeosoma fenestratum	Species	149880											
8	Ascidiae (yellow)	Chordata																																													1	Ascidiae	Class	1839						
591	Ascidiae sp (clear)	Chordata	R			R																																									5	Ascidiae	Class	1839						
20	Ascidiae sp 2	Chordata	R	R	R	O	O	R	O	O	R	O	R	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	17	Ascidiae	Class	1839													
1038	Asconema sp	Porifera	O		R	O	R	O	R	O	R	O	R	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	6	Asconema	Genus	132122														
650	Asconema sp (Porif mass glob 14)	Porifera	O	R	R	O	R	O	R	O	R	O	R	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	6	Asconema	Genus	132122														
1173	Asterioidea (cf Ceremaster/ Hymenaster, red/pink)	Echinodermata		O	R																																										4	Asterioidea	Class	123080						
1186	Asterioidea cf Spinulosida	Echinodermata	</																																																					

Table 15 Species list continued... (2 of 7)

Table 16 Species list continued... (3 of 7).

Table 17 Species list continued... (4 of 7).

Table 18 Species list continued... (5 of 7).

Table 19 Species list continued... (6 of 7).

O.T.U	AnalysisName	Phylum	1	2	3	4	5	6	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	45	46	47	48	49	50	51	52	#T	WoRMSname	Level	Aphiall
1164	Porifera cylindrical sp (rough)	Porifera																	R																													2	Porifera	Phylum	55					
118	Porifera encrusting (black/red)	Porifera																	R	R																											5	Porifera	Phylum	55						
800	Porifera encrusting (blue)	Porifera	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	33	Porifera	Phylum	55												
13	Porifera encrusting (green)	Porifera																	R																												2	Porifera	Phylum	55						
9	Porifera encrusting (orange)	Porifera																	R																												2	Porifera	Phylum	55						
75	Porifera encrusting globose (pale)	Porifera																	O		F	O																								9	Porifera	Phylum	55							
1	Porifera encrusting sp 1 (white)	Porifera	O	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	33	Porifera	Phylum	55														
30	Porifera encrusting sp 10 (yellow)	Porifera	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	26	Porifera	Phylum	55														
105	Porifera encrusting sp 18 (cream)	Porifera	R	R																																											5	Porifera	Phylum	55						
1128	Porifera globose (muddy)	Porifera																	R																												4	Porifera	Phylum	55						
1127	Porifera globose (spikyLoofah)	Porifera																																													1	Porifera	Phylum	55						
1178	Porifera globose/lobose (indetWhite)	Porifera																	O																												2	Porifera	Phylum	55						
1156	Porifera lamellate (bubbles)	Porifera	O															R	R																											4	Porifera	Phylum	55							
1101	Porifera lamellate (escarp)	Porifera																		R																											2	Porifera	Phylum	55						
1151	Porifera lamellate (Hexactiniosida)	Porifera	R	R																R																										3	Porifera	Phylum	55							
1177	Porifera lamellate (indetWhite)	Porifera																	O																											1	Porifera	Phylum	55							
1132	Porifera lamellate lobose (fleshy)	Porifera																	R																											7	Porifera	Phylum	55							
623	Porifera lamellate sp 10 (YellowSolenoAssoc)	Porifera	R	F	R	F	O											R	F																										8	Porifera	Phylum	55								
1010	Porifera lamellate sp 12 (solen Assoc)	Porifera	O		O	R		R	O		O	R	F	R	F		O		O	O	O	O																					16	Porifera	Phylum	55										
1053	Porifera lamellate sp 13	Porifera	O															O	O	F																										6	Porifera	Phylum	55							
422	Porifera lamellate sp 7	Porifera																		O	R																									5	Porifera	Phylum	55							
606	Porifera lamellate sp 9	Porifera	O	R	F	F	O	O	O	O	O	F					R			R	R	R																						14	Porifera	Phylum	55									
1029	Porifera lamellate sp X	Porifera																																													1	Porifera	Phylum	55						
1004	Porifera lobose cf Polymastia penicillus	Porifera	R																																												1	Porifera	Phylum	55						
601	Porifera massive globose sp 11 cf Geodia baretti	Porifera	F	O	O	O	R											R																												8	Porifera	Phylum	55							
648	Porifera massive globose sp 13	Porifera																																													3	Porifera	Phylum	55						
1051	Porifera massive globose sp 15 (solenosmilia Rubble Associated)	Porifera																O	F	O	R																									8	Porifera	Phylum	55							
137	Porifera massive globose sp 6	Porifera																	R																												5	Porifera	Phylum	55						
576	Porifera massive lobose sp 18(cf Farrea sp)	Porifera																R	R	F	R		O																							6	Porifera	Phylum	55							
616	Porifera massive lobose sp 22 (yellow cf Rhabdodictyum sp)	Porifera	O	O																																											2	Porifera	Phylum	55						
982	Porifera massive lobose sp 30	Porifera																																													2	Porifera	Phylum	55						
83	Porifera massive lobose sp 6 (cf Geodia)	Porifera	O	F	F													O	O	O	O																									13	Porifera	Phylum	55							
380	Porifera tubular (cf Asconema foliatum)	Porifera	R															R	F	O																										6	Porifera	Phylum	55							
1090	Porifera tubular glassy (cf Farreidae)	Porifera																																													2	Porifera	Phylum	55						
1162	Porifera vase (cf Aphrocallistes)	Porifera																																													1	Porifera	Phylum	55						
433	Pseudasterchaster sp 1	Echinodermata	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	28	Pseudasterchaster	Genus	12300														
1080	Pseudoanthomastus sp	Cnidaria																R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	5	Pseudoanthomastus	Genus	26777												
1071	Pseudotriakidae micronodon	Chordata																	O																											2	Pseudotriakidae micronodon	Species	10580							
252	Psolus squamatus	Echinodermata	O	N	F	O														F	F																								11	Psolus squamatus	Species	12471								
1169	Psychropotes depressa	Echinodermata	O																																												1	Psychropotes depressa	Species	12477						
1115	Pterasteridae sp	Echinodermata																R																												4	Pterasteridae	Family	12314							
299	Pterasteridae sp	Echinodermata																R																												1	Pterasteridae	Family	12314							
1044	Radicipes cf gracilis	Cnidaria		O														R																												7	Radicipes	Genus	12529							
1159	Rajiformes (indet)	Chordata	R	R		O																																								3	Rajiformes	Order	1021							
652	Rajiformes sp 1 poss Neoraja caerulea	Chordata	O															R	O	R	O	R	O	O	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	11	Rajiformes	Order	1021											
204	Reteporella sp 1	Bryozoa	O	O	R													A	F	R	O	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	15	Reteporella	Genus	11095												
611	Rhabdodictyum cf delicatum	Porifera	C	O													O	R																												6	Rhabdodictyum	Genus	13210							
1079																																																								

Table 20 Species list continued... (7 of 7).

4.2 Dive summaries

This section of the report contains the dive summary analysis from every dive undertaken on SeaRover 2017. Note that this section comprises the majority of this report. In order to maintain the per dive formatting for ease of reading, the first summary is found overleaf. Summaries are ordered by dive number, please utilise the quick view metadata tables to locate dives of interest. New more detailed maps per dive have been added into dive summaries for additional visualisation of dive progress and features.

DIVE SUMMARY	
DIVE #	TRANSECT #
449	1

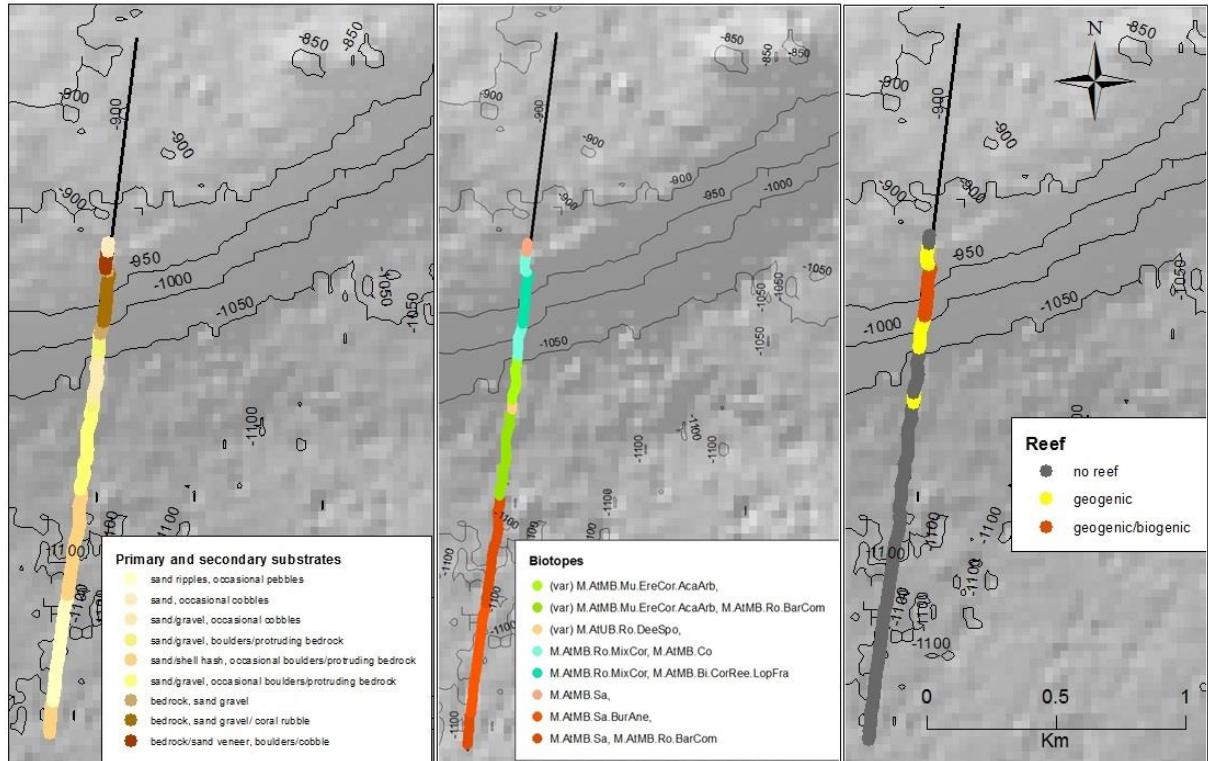
	Start	End
Date & Time	04/07/2017 10:56:13	04/07/2017 13:19:17
Latitude/ Longitude	53.48630833, -14.46494717	53.50207, -14.460913
Depth	1082m	898m
Images	3067-3100	
Sampling	n/a	

Location	Canyon 14, NW Porcupine Bank SAC
Target Features	Canyon, Escarpment
Depth Range	897m-1093m

Maps of Dive

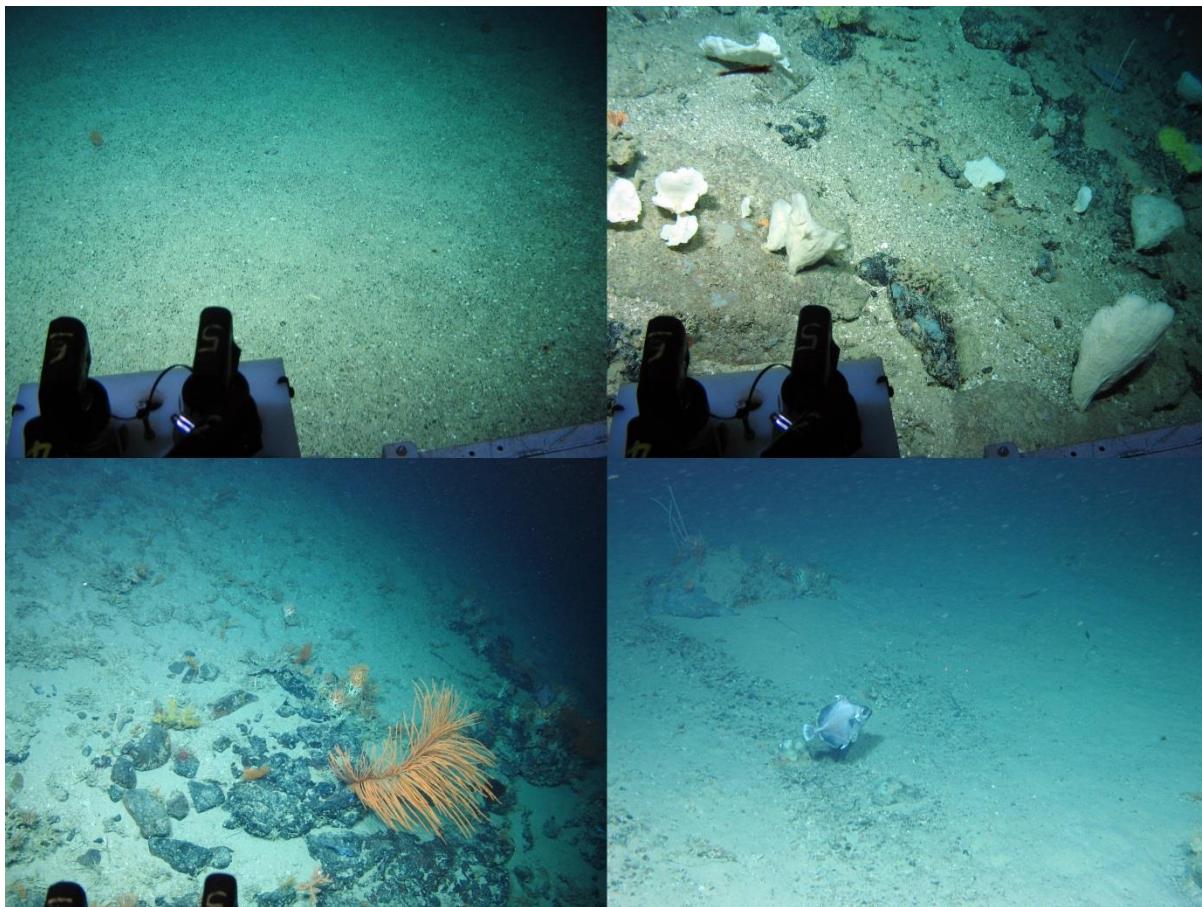
Plan and GIS Maps

Dive 449, Transect 1



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Coarse sediment (sand/gravel) with *Acanella arbuscula* ((coarse sediment variant of) M.AtMB.Mu.EreCor.AcaArb).

Top R. A deep-sea sponge aggregation dominated by *Phakellia ventillabrum* and encrusting sponges ((mid bathyal variant of) M.AtUB.Ro.DeeSpo).

Bottom L. Example image of steep slope with exposed bedrock and dead *Lophelia pertusa* framework, both hosting mixed cold-water corals (a coral garden) (M.AtMB.Ro.MixCor, M.AtMB.Bi.CorRee.LopFra). More than a third of this transect hosts these coral gardens.

Bottom R. Sand and occasional pebbles with boulders hosting discrete *Madrepora oculata* colonies and other cold-water corals (M.AtMB.Ro.MixCor).

Summary Description (habitat transitions noted)			
<p>START OF HD VIDEO [1] 0m/11:14am: The dive starts at the base of a canyon on a gentle upslope, over coarse sandy substrate (infrequent benthos) with occasional barnacle covered boulders. [2] 8m: The sand becomes rippled, sometimes forming ridges. Fauna sparse comprising cerianthid anemones, asteroids, and holothurians. One area with several <i>Polymastia cf penicilus</i> protruding from sand. [3] 31m: Similar flat sand and occasional barnacles, a couple of <i>Acanella arbuscula</i>. [4] 50m: Sand now gravelly, more encounters with <i>Acanella arbuscula</i>, some areas with dense possible Annelida tubes (unclear view). Slope becomes steeper. [5] 1h5m: A steeper section of slope gives rise to bedrock protrusions hosting many sponges, mainly <i>Phakellia ventillabrum</i>. [6] 1h7m: Return to shallower slope gravelly sand with sparse <i>A. arbuscula</i>. [7] 1h15m: Slope becomes steeper again, sediment coarser and boulders/bedrock protrusions often host <i>Madrepora oculata</i> along with encrusting organisms. [8] 1h20m: Steep slope with almost vertical bedrock, <i>Stichopathes cf gravieri</i> dominates with other occasional corals and encrusting fauna. Large areas with sand veneer. [9] 1h23m: Rich coral garden community on exposed bedrock mixed with biogenic predominantly dead <i>Lophelia pertusa</i> coral framework with sand veneer on a steep slope. Dominant fauna include black corals (especially <i>S. cf gravieri</i>), crinoids (<i>Koehlermetra porrecta</i>), and <i>Madrepora oculata</i>. [10] 1h50m: Transect crosses small escarpment (overhanging bedrock) reaching a flat summit of bedrock with patchy sand veneer and boulders. Continued coral garden community. [11] 2h1m: Terrain remains relatively flat, thicker sand veneer with cobbles and boulders continuing the coral garden community. [12] 2h2m: Transect ends on sand with occasional cerianthid anemones and echiurans (<i>Bonellia viridis</i>). END OF HD VIDEO.</p> <p>There are Many <i>Synaphobranchus kaupii</i> eels and small dark fish (Actinopterygii sp 3.) throughout. 3 juvenile (35m, 36m, 53m) and 1 adult (1h2m) <i>Galeus melastomus</i> sharks were encountered on this dive. It is unusual to see the juveniles. Several encounters with orange Roughy (<i>Hoplostethus atlanticus</i>) which is a listed species.</p>			

Physical Data			
Reef (types can be concurrent)	37% reef	37% geogenic	
		20% biogenic	<10% living >90% dead
Substrates		<ul style="list-style-type: none"> - Bedrock - Bedrock/sand veneer - Boulders/protruding bedrock - Cobbles - Pebbles - Sand - Sand ripples - Sand/gravel (coarse) - Coral rubble (coarse) - Sand/shell hash (coarse) 	
Geomorphology/Features		<ul style="list-style-type: none"> - Submarine canyon - Escarpment 	
Annex 1 Types		<ul style="list-style-type: none"> - Boulder/cobble fields - Sloping/flat bedrock - Dead coral structures/coral rubble fields 	
Pressures		<ul style="list-style-type: none"> - 4 items of plastic litter 	

Biological Data				
Number of Species		81		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U	Species/Taxonomic ID	Size/Growth	SACFOR	
315	Koehlermetra porrecta	L	C	
283	Stichopathes cf gravieri	L	C	
440	Synaphobranchus kaupii	L	C	
585	Acanella arbuscula	L	F	
328	Bathypathes sp 1	L	F	
249	Lepidion eques	L	F	
251	Madrepora oculata	L	F	
202	Phakellia ventillabrum	L	F	
330	Phanopathes sp	L	F	
1193	Primnoidae sp (unbranching)	L	F	
1	Porifera encrusting sp 1 (white)	Crust	O	
608	Acanthogorgia cf armata	L	O	
1187	Antipathes dichotoma	L	O	
264	Aphrocalistes sp	L	O	
188	Araeosoma fenestratum	L	O	
320	cf Antipathella sp	L	O	
653	Chimera opalescens	L	O	
1008	Chrysogorgiidae sp 1	L	O	
540	Chrysopathes sp/Trissopathes sp	L	O	
303	Coelorrhinchus coelorrhinchus	L	O	
1015	Dendrobathyphates sp	L	O	
1005	Galeus melastomus	L	O	
307	Gorgonacea sp 7 (pink) cf Isidella	L	O	
214	Gorgonocephalus sp 1	L	O	
227	Helicolenus dactylopterus	L	O	
651	Hoplostethus atlanticus	L	O	
274	Hymenodiscus coronata/ Brisinga endacacnemos	L	O	
305	Leiopathes sp	L	O	
612	Leiopathes sp (dense)	L	O	
250	Lophelia pertusa	L	O	
349	Mora moro	L	O	
563	Neocytthus helgae	L	O	
1012	Notacanthiformes sp 1	L	O	
1010	Porifera lamellate sp 12 (solen Assoc)	L	O	
652	Rajiformes sp 1 poss Neoraja caerulea	L	O	
4	Actiniaria sp 1	M	O	
930	Actinopterygii sp 3	M	O	
267	Bonellia viridis	M	O	
252	Psolus squamatus	M	O	
204	Reteponella sp 1	M	O	
106	Serpulidae sp 1	M	O	
82	Cirripedia sp	Mass	O	
800	Porifera encrusting (blue)	Crust	R	
30	Porifera encrusting sp 10 (yellow)	Crust	R	
105	Porifera encrusting sp 18 (cream)	Crust	R	
258	Brosme brosme	L	R	
593	Coelorrhinchus labiatus	L	R	
566	Coryphaenoides rupestris	L	R	
1003	Nezumia aequalis	L	R	
1009	Notacanthidae sp 1 (Notacanthus cheminizii)	L	R	
304	Paramola cuvieri	L	R	
1016	Trichiurus lepturus	L	R	
1006	Actinopterygii sp 4	M	R	
278	Anthomastus grandiflorus	M	R	
591	Ascidiae sp (clear)	M	R	
20	Ascidiae sp 5	M	R	
1077	Caridea (indet)	M	R	
234	Ceramaster/Peltaster/Plinthaster sp 1	M	R	
211	Cidaris cidaris	M	R	
1002	Goniasteridae sp	M	R	
208	Henricia sanguinolenta	M	R	
628	Holothuroidea sp 4 (cf Amperima)	M	R	
285	Majidae sp 2	M	R	
200	Munida sarsi	M	R	
340	Ophiuroidea sp 7 - yellow	M	R	
207	Pliobrotus sp	M	R	
1004	Porifera lobose cf Polymastia penicillus	M	R	
433	Pseudarchaster sp 1	M	R	
54	Sabellidae sp 1	M	R	
361	Stylaster sp 1	M	R	
261	Syringammina fragilissima	M	R	
1007	Unknown octocoral or annelid	M	R	
259	Zoarcidae sp 1	M	R	
1011	Unknown annelida or porifera	Mass	R	
532	Unknown sp 26 (Sabellidae?)	Mass	R	
478	Actiniaria sp 13 (pink/purple)	S	R	
605	Actiniaria sp 20	S	R	
6	Caryophyllia sp	S	R	
2	Ceriantharia	S	R	
23	Halcampoididae sp 1	S	R	
1017	Teuthidae (indet)	S	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed/Vulnerable
M.AtMB.Bi.CorRee.LopFra	Mixed coral assemblage on Atlantic mid bathyal <i>Lophelia pertusa</i> reef framework (biogenic structure)	<i>Lophelia pertusa</i> reef (OSPAR) Cold-water coral reef (ICES), <i>Lophelia pertusa/Madrepora oculata</i> reef (ICES subcategory)
M.AtMB.Co	Atlantic mid coarse sediment	
(var) M.AtMB.Mu.EreCor.AcaArb	(Coarse sediment variant of) Acanella arbuscula assemblage on Atlantic mid bathyal mud	? Coral Garden (ICES/OSPAR) Soft bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtMB.Ro.BarCom	Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
(var) M.AtUB.Ro.DeeSpo	(Mid Bathyal variant of) Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	Deep Sea Sponge Aggregations (OSPAR/ICES), Hard-bottom sponge aggregation (ICES subcategory)
M.AtMB.Ro.MixCor	Mixed cold water coral community on Atlantic mid bathyal rock and other hard substrata	Coral Garden (ICES/OSPAR), Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtMB.Sa	Atlantic mid bathyal sand	
M.AtMB.Sa.BurAne	Burrowing anemone field in Atlantic mid bathyal sand	Anemone aggregations (ICES), Soft-bottom anemone aggregations (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtMB.Sa, M.AtMB.Ro.BarCom OTU628 Holothuroidea sp 4, OTU82 Cirripedia sp.	
2	M.AtMB.Sa.BurAne OTU2 Ceriantharia	
3	M.AtMB.Sa, M.AtMB.Ro.BarCom OTU2 Ceriantharia, OTU82 Cirripedia sp.	
4	(var) M.AtMB.Mu.EreCor.AcaArb, M.AtMB.Ro.BarCom OTU585/991 Acanella arbuscula (bushy/firtree morphs), OTU82 Cirripedia sp.	
5	(var) M.AtUB.Ro.DeeSpo OTU202 Phakellia ventillabrum	
6	(var) M.AtMB.Mu.EreCor.AcaArb OTU585/991 Acanella arbuscula (bushy/firtree morphs)	
7	(var) M.AtMB.Ro.MixCor.DisLop, M.AtMB.Co OTU251 Madrepora oculata, OTU2 Ceriantharia	
8	M.AtMB.Ro.MixCor, M.AtMB.Co	

	OTU283 Stichopathes cf gravieri, OTU267 Bonella viridis
9	M.AtMB.Ro.MixCor, M.AtMB.Bi.CorRee.LopFra OUT 315 Koehlermetra porrecta, OTU283 Stichopathes cf gravieri
10	M.AtMB.Ro.MixCor, M.AtMB.Co OTU283 Stichopathes cf gravieri, OTU251 Madreporea oculata, OTU267 Bonella viridis
11	M.AtMB.Sa OTU267 Bonella viridis

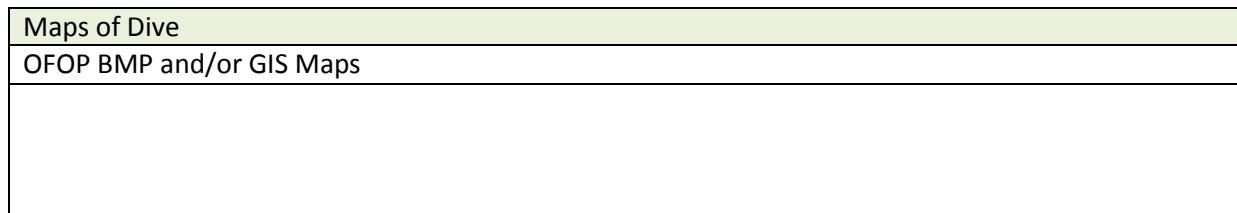
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral Gardens		ICES/ OSPAR
Hard-bottom coral garden:		ICES subcategory
- Hard-bottom gorgonian and black coral gardens		ICES subcategory
- Colonial scleractinians on rocky outcrops		ICES subcategory
(sparse) Soft-bottom coral garden:		ICES subcategory
- Soft-bottom gorgonian and black coral gardens		ICES subcategory
Deep Sea Sponge Aggregations		ICES/OSPAR
- Hard-bottom sponge aggregation		ICES subcategory
Anemone aggregations		ICES
- Soft-bottom anemone aggregations		ICES subcategory
Listed Species Encountered (Fish, Count)		
Orange Roughy (<i>Hoplostethus atlanticus</i>)	7	OSPAR

Additional Comments		
<ul style="list-style-type: none"> - Notable as a coral garden with both geogenic and biogenic components. The unbranching primnoid corals (OTU1193) seen on this dive were not seen on any other dives from this survey (but were encountered again on SeaRover 2018 and sampled for better identification in the future). 		

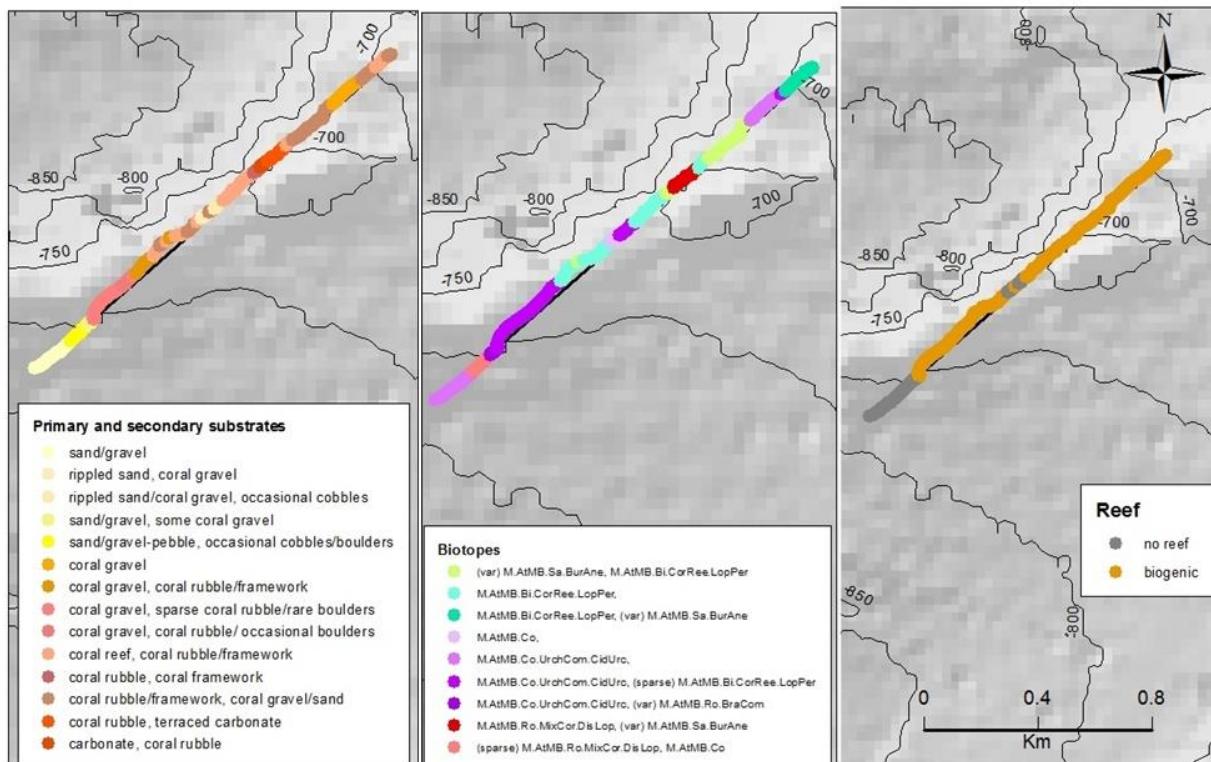
DIVE SUMMARY			
DIVE #	450	TRANSECT #	2

	Start	End
Date & Time	04/07/2018 16:07:10	04/07/2018 18:44:40
Latitude/ Longitude	53.511748, -14.343048	53.519759, -14.327525
Depth	780m	661m
Images	3101-3174	
Samples	8 Cidaris cidaris, 6 Lophelia pertusa(14 events)	

Location	W of C14, NW Porcupine Bank SAC
Target Features	Carbonate mounds
Depth Range	659m -781m

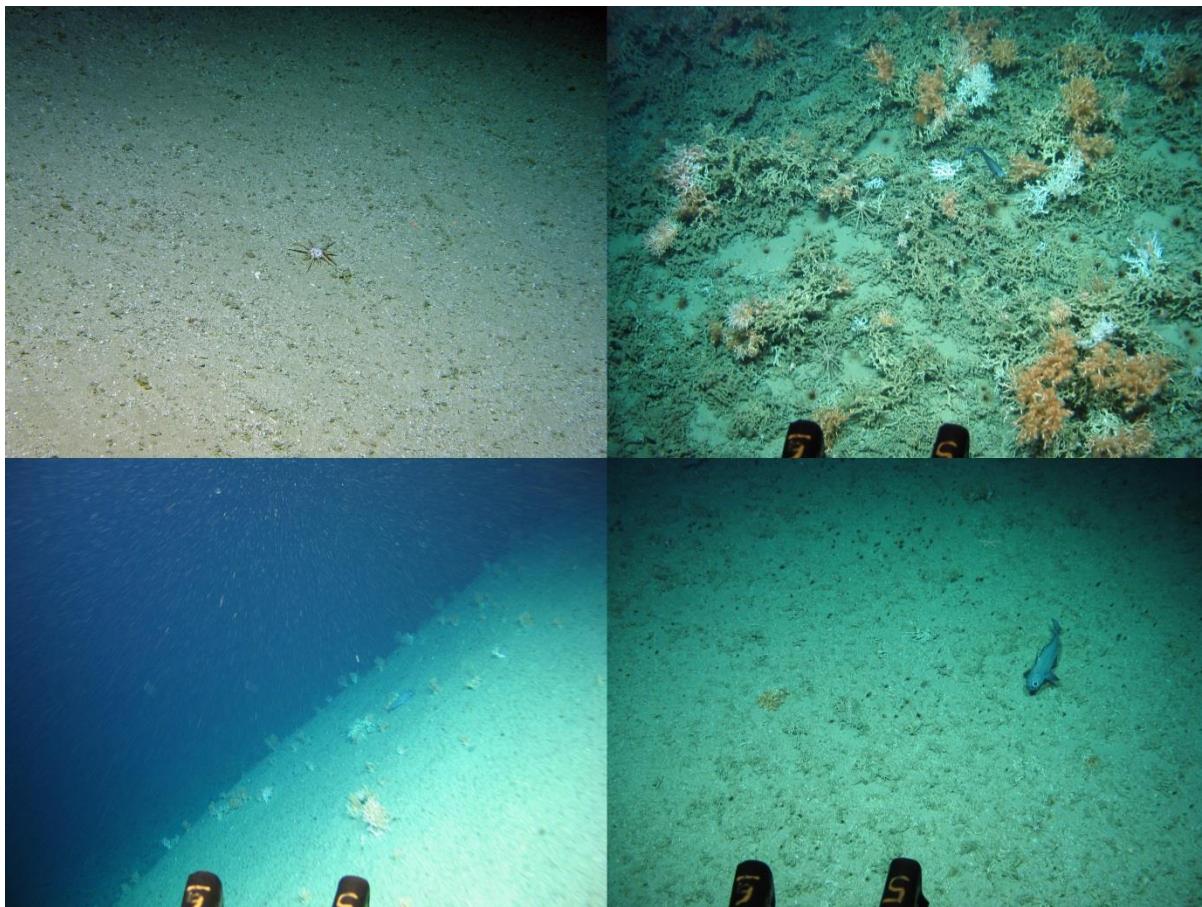


Dive 450, Transect 2



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Example of coarse sediment (sand/gravel/coral rubble), with *Cidaris cidaris* urchins, and brachiopods (M.AtMB.Co.UrcCom.CidUrc, (coarse sediment variant of) M.AtMB.Ro.BraCom).

Top R. A typical reef scene dominated by *Lophelia pertusa* and *Madrepora oculata* with *C. cidaris*, *Lepidion eques*, and Cerianthid anemones. (M.AtMB.Bi.CorRee.LopPer). The vast majority of this transect hosts varying densities of this biotope.

Bottom L. Carbonate cliffs (which counts as “other hard substrate”) with discrete *L. pertusa* colonies (M.AtMB.Ro.MixCor.DisLop).

Bottom R. Coral rubble/gravel counts as coarse sediment, here showing a Cerianthid burrowing anemone field ((coarse sediment variant of) M.AtMB.Sa.BurAne).

Summary Description (habitat transitions noted)	
<p>START OF HD VIDEO A [1] 0m Transect starts on coarse sandy sediment with <i>Cidaris cidaris</i>, 3 <i>C. cidaris</i> sampled. [2] 26m Sediment becomes coarser with some gravel and pebbles and occasional cobbles/boulders, mainly <i>Pliobrothus</i> sp on cobbles. [3] 30m Return to coarse sediment with coral gravel constituent, some <i>C. cidaris</i> (3 sampled) but when zoomed for sampling brachiopods become apparent. [4] 43m (Transitional community) Reached edge of carbonate mound, sand/coral gravel with patchy/sparse mosaicked reef sampled 3 <i>C. cidaris</i>, 1 <i>Lophelia pertusa</i>. Change of direction and travel upslope [5] 1h15m Dense coral reef of <i>L. pertusa</i> and <i>Madrepora oculata</i> on steep slope, summit and downslope to saddle area. [6] 1h20m Area of coral rubble/gravel mosaicked with reef. May indicate areas of trawl damage. [7] 1h20m Dense coral reef summits, school of black cardinal fish (<i>Epigonus telescopus</i>) encountered over saddle between summits [8] 1h25m Saddle region with rippled coarse sediment (sand/coral gravel) and abundant Blackbelly rosefish (<i>Helicolenus dactylopterus</i>) [9] 1h26m Mosaic of <i>C. cidaris</i> on coarse sediment and patchy/sparse coral reef [10] 1h29m Low lying coral reef on steep upslope. [11] 1h37m Another area of coral rubble/gravel mosaicked with reef. May indicate areas of trawl damage. [12] 1h38m Cliffs of carbonate terraced with areas of coral rubble/gravel, burrowing anemones (Ceriantharia) dominate. [13] 1h42m Dense reef. [14] 1h44m Coral gravel/sand with patchy/sparse mosaicked reef END OF HD VIDEO A 1h51/17:58 START OF HD VIDEO B 0m/18:00 Continued gravel/sand and reef mosaic. [15] 2m Relatively flat coral gravel/sand with <i>C. cidaris</i>. Shoal of juvenile <i>Synaphobranchus kaupii</i> (overlaps previous reef patch too). [16] 8m <i>C. cidaris</i> continues mosaicked with sparse/patchy reef. [17] 9m Denser but patchy reef interspersed with Cerianthids on coral gravel. END OF HD VIDEO B 44m/18:44</p>	

Physical Data			
Reef (types can be concurrent)	95% reef	0% geogenic	
		95% biogenic	25-50% living
Substrates encountered		- carbonate - coral gravel - coral reef - coral rubble/framework - sand/gravel - cobbles/boulders	50-75% dead
Geomorphology/Features		- Carbonate mound o terracing - Continental slope	
Annex 1 Types		- Coral rubble fields - Dead coral structures - Mound summit and high slope areas - Vertical rock walls	
Pressures		- 5 misc plastic - 1 full rubbish bag - 3 rope/lost fishing gear - possible signs of trawl damaged reef	

Biological Data				
Number of Species		56		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Species	Size/Growth	SACFOR	
249	Lepidion eques	L	A	
250	Lophelia pertusa	L	A	
251	Madrepora oculata	L	A	
211	Cidaris cidaris	M	A	
440	Synaphobranchus kaupii	L	C	
188	Araeosoma fenestratum	L	F	
2	Ceriantharia	S	F	
254	Chaceon affinis	L	O	
265	Chimaera monstrosa	L	O	
303	Coelorhinchus coelorrhinchus	L	O	
1018	Epigonus telescopus	L	O	
227	Helicolenus dactylopterus	L	O	
56	Hydrozoa flat/branched	L	O	
654	Molva molva	L	O	
349	Mora moro	L	O	
255	Phelliactis sp 1	L	O	
1020	Phycis blennoides	L	O	
4	Actiniaria sp 1	M	O	
458	Pachycerianthus multiplacatus	M	O	
30	Porifera encrusting sp 10 (yellow)	Crust	R	
235	Bathynectes sp	L	R	
328	Bathyphantes sp 1	L	R	
307	Gorgonacea sp 7 (pink) cf Isidella	L	R	
273	Lophius piscatorius	L	R	
1019	Merlangius merlangus	L	R	
171	Mycale lingua	L	R	
198	Stichastrella rosea	L	R	
1016	Trichiurus lepturus	L	R	
930	Actinopterygii sp 3	M	R	
278	Anthomastus grandiflorus	M	R	
20	Ascidiae sp 2	M	R	
388	Ceramaster/Peltaster/Plinthaster sp 2	M	R	
113	Colus sp	M	R	
1002	Goniasteridae sp	M	R	
208	Henricia sanguinolenta	M	R	
285	Majidae sp 2	M	R	
340	Ophiuroidea sp 7 - yellow	M	R	
207	Pliobrothus sp	M	R	
263	Porania pulvillus	M	R	
252	Psolus squamatus	M	R	
54	Sabellidae sp 1	M	R	
106	Serpulidae sp 1	M	R	
198	Stichastrella rosea	M	R	
32	Anomiidae sp 1	Mass	R	
289	cf Clavulariidae sp	Mass	R	
605	Actiniaria sp 20	S	R	
976	Actiniaria sp 27	S	R	
41	Actiniidae sp (sandBolocera)	S	R	
34	Brachiopoda	S	R	
6	Caryophyllia sp	S	R	
43	Corallimorphidae sp 2	S	R	
131	Crinoidea sp 1	S	R	
23	Halcampoididae sp 1	S	R	
277	Margarites sp 1	S	R	
205	Paguridae spp	S	R	
1017	Teuthidae (indet)	S	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtMB.Bi.CorRee.LopPer	Atlantic mid bathyal live <i>Lophelia pertusa</i> reef (biogenic structure)	Carbonate mound (OSPAR); <i>Lophelia pertusa</i> reef (OSPAR); Cold-water coral reef (ICES), <i>Lophelia pertusa/Madrepora oculata</i> reef (ICES subcategory)
M.AtMB.Co	Atlantic mid bathyal coarse sediment	
M.AtMB.Co.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic mid bathyal coarse sediment	
(var) M.AtMB.Ro.BraCom	(Coarse sediment variant of) Brachiopod dominated community on Atlantic mid bathyal rock and other hard substrata	
M.AtMB.Ro.MixCor.DisLop	Discrete <i>Lophelia pertusa</i> colonies on Atlantic mid bathyal rock and other hard substrata	
(var) M.AtMB.Sa.BurAne	(coarse sediment variation of) Burrowing anemone field in Atlantic mid bathyal sand	Anemone aggregations (ICES), Soft-bottom anemone aggregations (ICES subcategory)
Biotope progression through transect (# species, dominant/characteristic species)		
1	M.AtMB.Co.UrcCom.CidUrc 211 <i>Cidaris cidaris</i>	
2	(sparse) M.AtMB.Ro.MixCor.DisLop, M.AtMB.Co 207 <i>Pliobrothus</i> sp	
3	M.AtMB.Co.UrcCom.CidUrc, (var) M.AtMB.Ro.BraCom 211 <i>Cidaris cidaris</i> 34 Brachiopoda	
4	M.AtMB.Co.UrcCom.CidUrc, (sparse) M.AtMB.Bi.CorRee.LopPer 211 <i>Cidaris cidaris</i> , 250 <i>Lophelia pertusa</i>	
5	M.AtMB.Bi.CorRee.LopPer 250 <i>Lophelia pertusa</i> , 251 <i>Madrepora oculata</i>	
6	(var) M.AtMB.Sa.BurAne, M.AtMB.Bi.CorRee.LopPer 2 <i>Ceriantharia</i> , 250 <i>Lophelia pertusa</i>	
7	M.AtMB.Bi.CorRee.LopPer 250 <i>Lophelia pertusa</i> , 251 <i>Madrepora oculata</i>	
8	M.AtMB.Co 227 <i>Helicolenus dactylopterus</i>	
9	M.AtMB.Co.UrcCom.CidUrc, (sparse) M.AtMB.Bi.CorRee.LopPer 211 <i>Cidaris cidaris</i> , 250 <i>Lophelia pertusa</i>	
10	M.AtMB.Bi.CorRee.LopPer 250 <i>Lophelia pertusa</i> , 251 <i>Madrepora oculata</i>	
11	(var) M.AtMB.Sa.BurAne, M.AtMB.Bi.CorRee.LopPer 2 <i>Ceriantharia</i> , 250 <i>Lophelia pertusa</i>	
12	M.AtMB.Ro.MixCor.DisLop, (var) M.AtMB.Sa.BurAne 2 <i>Ceriantharia</i> , 250 <i>Lophelia pertusa</i>	
13	M.AtMB.Bi.CorRee.LopPer	

	250 <i>Lophelia pertusa</i> , 251 <i>Madrepore oculata</i>
14	(var) M.AtMB.Sa.BurAne, M.AtMB.Bi.CorRee.LopPer 2 Ceriantharia, 250 <i>Lophelia pertusa</i>
15	M.AtMB.Co.UrcCom.CidUrc 211 <i>Cidaridae</i> <i>cidaris</i>
16	M.AtMB.Co.UrcCom.CidUrc, (sparse) M.AtMB.Bi.CorRee.LopPer 211 <i>Cidaridae</i> <i>cidaris</i> , 250 <i>Lophelia pertusa</i>
17	M.AtMB.Bi.CorRee.LopPer, (var) M.AtMB.Sa.BurAne 250 <i>Lophelia pertusa</i> , 251 <i>Madrepore oculata</i> , 2 Ceriantharia

Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Carbonate mound	OSPAR	
Lophelia pertusa reef	OSPAR	
Cold-water coral reef	ICES	
- <i>Lophelia pertusa/Madrepore oculata</i> reef	ICES subcategory	
Anemone aggregations	ICES	
- Soft-bottom anemone aggregations	ICES subcategory	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
- Large Lophelia reef		

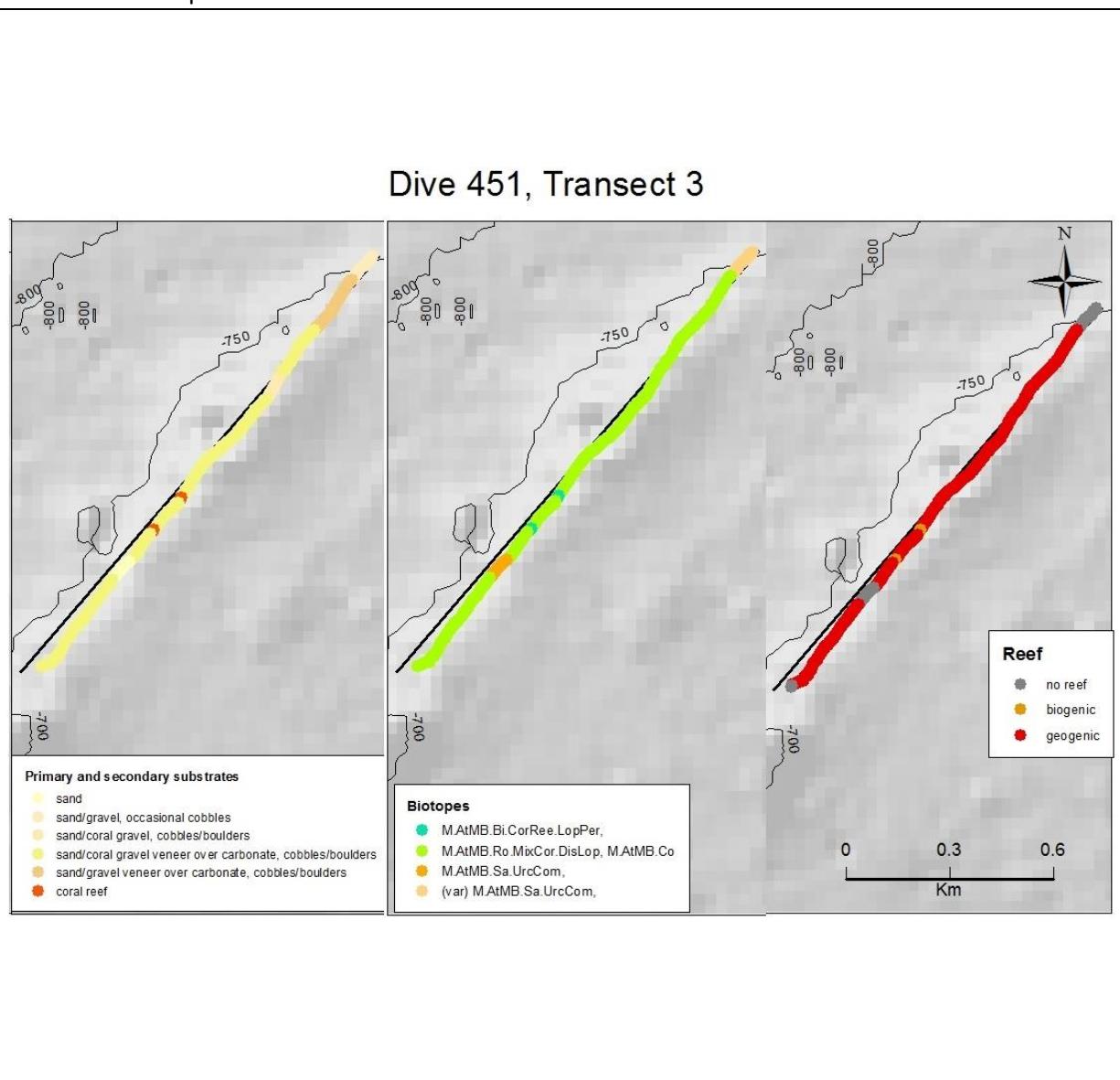
DIVE SUMMARY	
DIVE #	TRANSECT #
451	3

	Start	End
Date & Time	04/07/2017 21:28:39	04/07/2017 23:10:27
Latitude/ Longitude	53.5794925, -14.329375	53.569701, -14.3432115
Depth	735m	712m
Images	3175-3198 (many blurry)	
Samples	n/a	

Location	S of C13, NW Porcupine Bank SAC
Target Features	Carbonate mounds
Depth Range	681m-735m

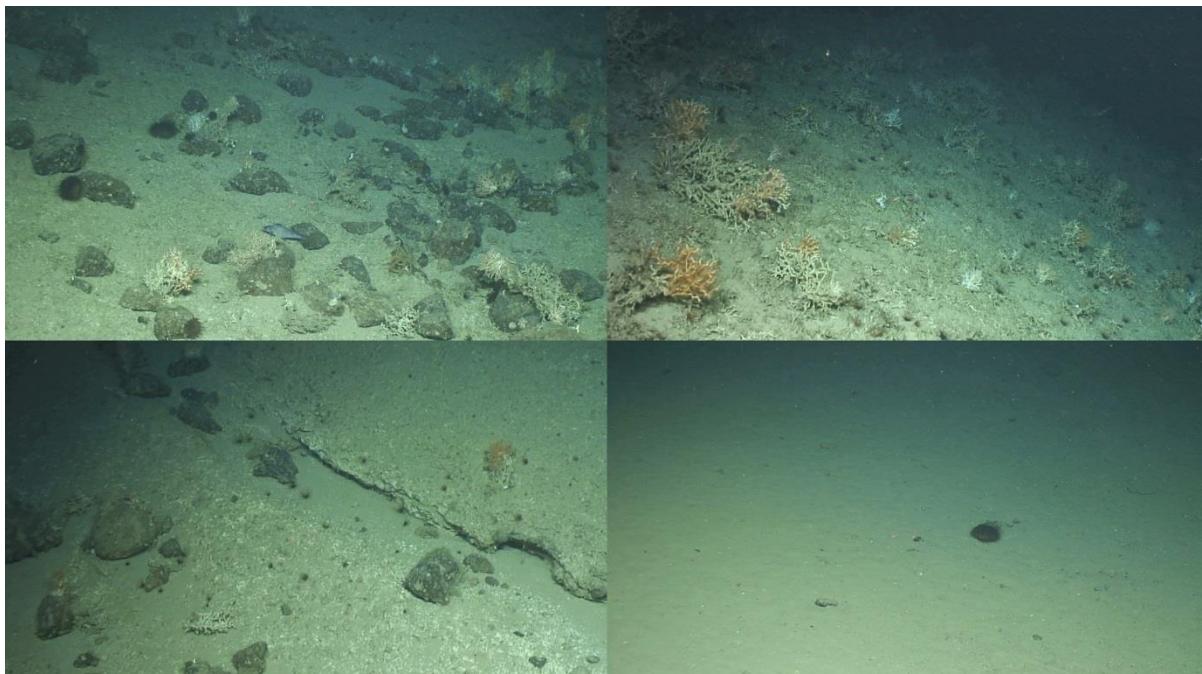
Maps of Dive

Plan and GIS Maps



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The dominant biotope mosaic consisted of discrete coral colonies on cobbles and boulders, while intermediate areas displayed coarse sediment, often as a veneer over carbonate rock.
(M.AtMB.Ro.MixCor.DisLop, M.AtMB.Co)

Top R. Two small areas of Lophelia pertusa reef were encountered (M.AtMB.Bi.CorRee.LopPer)

Bottom L. The dominant biotope mosaic sometimes presented with the discrete coral colonies attaching to the underlying carbonate. Features such as this crust overhang were sometimes encountered (M.AtMB.Ro.MixCor.DisLop, M.AtMB.Co).

Bottom R. The remaining 10% of the transect displayed as an *Araeosoma fenestratum* urchin community on sand or coarse sediment. (M.AtMB.Sa.UrcCom)

Summary Description (habitat transitions noted)	
<p>START OF HD VIDEO 0m/ 21:28pm [1] The transect starts on a moderate slope of coarse sediment with occasional cobbles and boulders and many Hairtail (<i>Trichiurus lepturus</i>) being encountered. 6m [2]: For the next hour two biotopes dominate although the sediment types vary. Discrete coral colonies occupy cobbles and boulders, and sometimes protruding terraced carbonate rock. <i>Madrepora oculata</i> dominates, but <i>Lophelia pertusa</i> occurs too along with occasional other corals. The coarse sediment, of sand and gravel or coral gravel, forms a thin veneer over the carbonate rock slope between the hard substrate areas/ terrace step features, and mainly hosts (in varying densities) Cerianthid anemones, <i>Cidaris cidaris</i> urchins, and <i>Bonellia viridis</i> echiuran worms. 1h1m [3]: A carbonate terrace gives rise to a <i>Lophelia pertusa</i> reef which the ROV climbs up and over. 1h2m [4]: Behind (and below) the reef returns to the previous mosaicked landscape of coarse substrate with discrete coral colonies on cobbles/boulders/carbonate. 1h8m [5]: after climbing a small cliff of carbonate with a couple of holes eroded into it, the next terrace again hosts Lophelia pertusa reef, although sparser than before then at 1h9m [6]: returns back to a gently undulating landscape of coarse sediment and discrete colonies on cobbles/boulders. 1h15m [7]: the landscape levels off to a large area of sand with sparse fauna (mainly the Echinothurid urchin <i>Araeosoma fenestratum</i>) and occasional pebbles 1h19m [8]: but again this returns to varying substrates (coarse coral gravel/sand sediment veneered steep carbonate, or cobbles/boulders on coarse coral gravel/sand sediment) hosting the dominant biotope mosaic. END OF HD VIDEO 1h41m/23:10pm</p>	

Physical Data			
Reef (types can be concurrent)	90% reef	88% geogenic	
		2% biogenic	<25% living >75% dead
Substrates	<ul style="list-style-type: none"> - boulders - carbonate - cobbles - coral reef - sand/gravel - sand/coral gravel 		
Geomorphology/Features	Carbonate mound <ul style="list-style-type: none"> - carbonate cliff - carbonate crack - carbonate crust - carbonate crust overhang - carbonate step - holes in carbonate 		
Annex 1 Types	<ul style="list-style-type: none"> - boulder/cobble fields - sloping bedrock - vertical rock walls 		
Pressures	<ul style="list-style-type: none"> - 3 plastic - 1 plastic/fabric 		

Biological Data					
Number of Species		60 spp			
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)					
O.T.U	Name	Size/Growth	SACFOR		
250	<i>Lophelia pertusa</i>	L	A		
251	<i>Madrepora oculata</i>	L	A		
211	<i>Cidaris cidaris</i>	M	A		
188	<i>Araeosoma fenestratum</i>	L	C		
249	<i>Lepidion eques</i>	L	C		
2	<i>Ceriantharia</i>	S	C		
283	<i>Stichopathes cf gravieri</i>	L	F		
440	<i>Synaphobranchus kaupii</i>	L	F		
1016	<i>Trichiurus lepturus</i>	L	F		
207	<i>Pliobrothus sp</i>	M	F		
252	<i>Psolus squamatus</i>	M	F		
1	Porifera encrusting sp 1 (white)	Crust	O		
328	<i>Bathypathes sp 1</i>	L	O		
254	<i>Chaceon affinis</i>	L	O		
303	<i>Coelorrhinchus coelorrhinchus</i>	L	O		
1005	<i>Galeus melastomus</i>	L	O		
1022	<i>Gersemia sp 3</i>	L	O		
307	<i>Gorgonacea sp 7 (pink) cf Isidella</i>	L	O		
349	<i>Mora moro</i>	L	O		
266	<i>Parastichopus tremulus</i>	L	O		
4	<i>Actiniaria sp 1</i>	M	O		
267	<i>Bonellia viridis</i>	M	O		
285	<i>Majidae sp 2</i>	M	O		
458	<i>Pachycerianthus multiplacatus</i>	M	O		
204	<i>Reteponrella sp 1</i>	M	O		
106	<i>Serpulidae sp 1</i>	M	O		
32	<i>Anomiidae sp 1</i>	Mass	O		
605	<i>Actiniaria sp 20</i>	S	O		
23	<i>Halcampoididae sp 1</i>	S	O		
800	Porifera encrusting (blue)	Crust	R		
30	Porifera encrusting sp 10 (yellow)	Crust	R		
235	<i>Bathynectes sp</i>	L	R		
258	<i>Brosme brosme</i>	L	R		
1018	<i>Epigonus telescopus</i>	L	R		
214	<i>Gorgonocephalus sp 1</i>	L	R		
227	<i>Helicolenus dactylopterus</i>	L	R		
274	<i>Hymenodiscus coronata/ Brisinga endacanemos</i>	L	R		
315	<i>Koehlermetra porrecta</i>	L	R		
305	<i>Leiopathes sp</i>	L	R		
1019	<i>Merlangius merlangus</i>	L	R		
171	<i>Mycale lingua</i>	L	R		
304	<i>Paramola cuvieri</i>	L	R		
1020	<i>Phycis blennoides</i>	L	R		
198	<i>Stichastrella rosea</i>	L	R		
1006	<i>Actinopterygii sp 4</i>	M	R		
278	<i>Anthomastus grandiflorus</i>	M	R		
20	<i>Ascidiaeae sp 2</i>	M	R		
388	Ceramaster/Peltaster/Plinthaster sp 2	M	R		
113	<i>Colus sp</i>	M	R		
208	<i>Henricia sanguinolenta</i>	M	R		
50	Hydrozoa (bushy)	M	R		
340	<i>Ophiuroidae sp 7 - yellow</i>	M	R		
1023	<i>Periphylla periphylla</i>	M	R		
263	<i>Porania pulvillus</i>	M	R		
1017	Teuthidae (indet)	M	R		
289	cf Clavulariidae sp	Mass	R		
907	<i>Actiniaria sp 24</i>	S	R		
976	<i>Actiniaria sp 27</i>	S	R		
41	Actiniidae sp (sandBolocera)	S	R		
43	<i>Corallimorphidae sp 2</i>	S	R		

Biotope List (Marine Habitat Classification for Britain & Ireland)					
Code	Name	Listed			
M.AtMB.Bi.CorRee.L opPer	Atlantic mid bathyal live <i>Lophelia pertusa</i> reef (biogenic structure)	<i>Lophelia pertusa</i> reef (OSPAR); Cold-water coral reef (ICES), <i>Lophelia pertusa/Madrepora oculata</i> reef (ICES subcategory)			

M.AtMB.Co	Atlantic mid bathyal coarse sediment	
M.AtMB.Sa.UrcCom (and var)	Urchin dominated community on Atlantic mid bathyal sand (and a coarse sediment variant)	
M.AtMB.Ro.MixCor. DisLop	Discrete <i>Lophelia pertusa</i> colonies on Atlantic mid bathyal rock and other hard substrata	Coral gardens (OSPAR/ICES); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtMB.Sa.UrcCom OTU188 Araeosoma fenestratum, OTU1021 Trichiuridae sp	
2	M.AtMB.Ro.MixCor.DisLop, M.AtMB.Co OTU251 Madrepora oculata, OTU2 Ceriantharia/OTU211 Cidaris cidaris	
3	M.AtMB.Bi.CorRee.LopPer OTU250 Lophelia pertusa	
4	M.AtMB.Ro.MixCor.DisLop, M.AtMB.Co OTU251 Madrepora oculata, OTU2 Ceriantharia/OTU211 Cidaris cidaris	
5	M.AtMB.Bi.CorRee.LopPer OTU250 Lophelia pertusa	
6	M.AtMB.Ro.MixCor.DisLop, M.AtMB.Co OTU251 Madrepora oculata, OTU2 Ceriantharia/OTU211 Cidaris cidaris	
7	M.AtMB.Sa.UrcCom OTU188 Araeosoma fenestratum	
8	M.AtMB.Ro.MixCor.DisLop, M.AtMB.Co OTU251 Madrepora oculata, OTU2 Ceriantharia/OTU211 Cidaris cidaris	

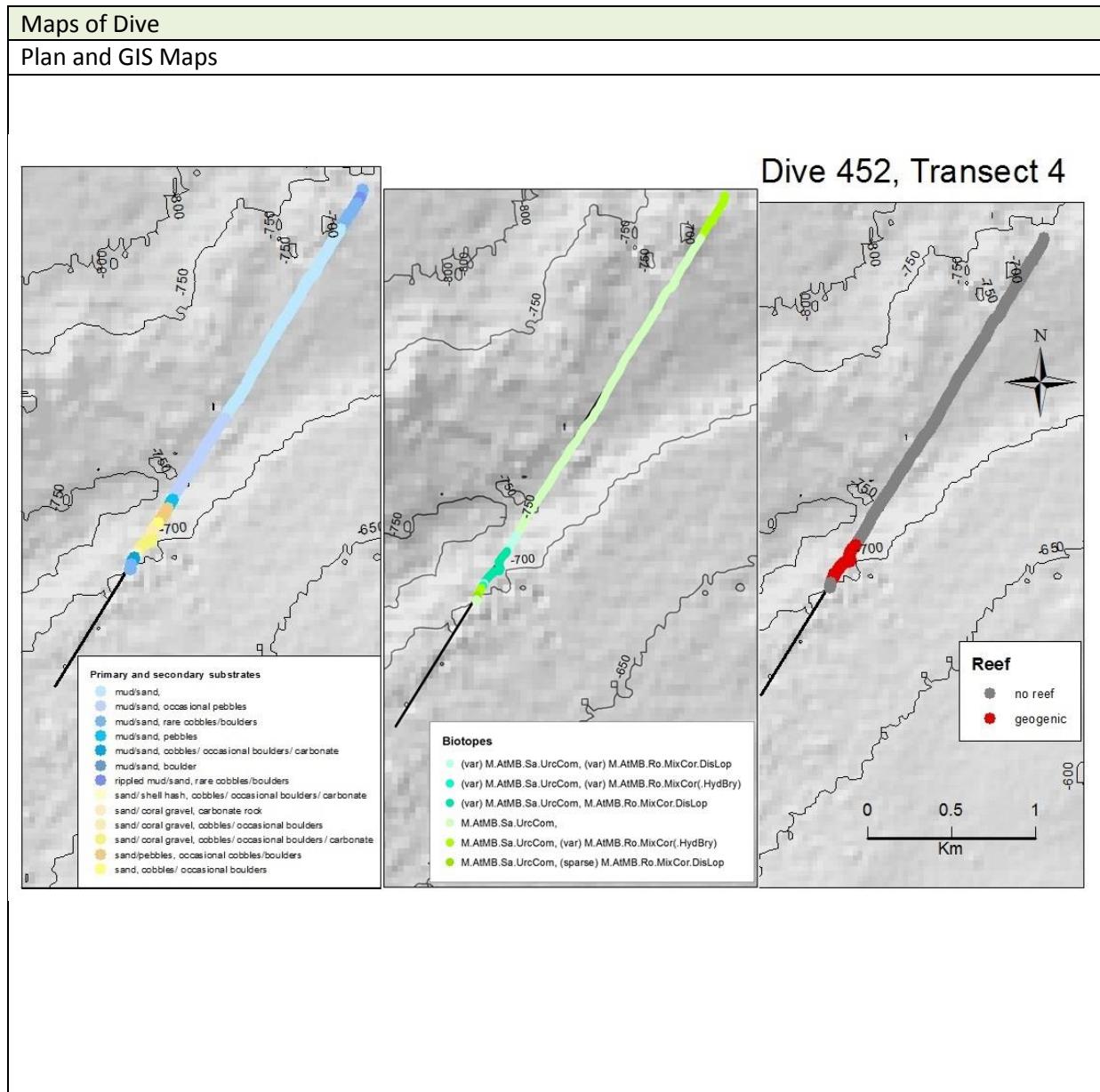
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Carbonate mound	OSPAR	
Lophelia pertusa reef	OSPAR	
Cold-water coral reef	ICES	
- <i>Lophelia pertusa/Madrepora oculata</i> reef	ICES subcategory	
Coral Gardens	ICES/ OSPAR	
Hard-bottom coral garden:	ICES subcategory	
- Colonial scleractinians on rocky outcrops	ICES subcategory	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - Carbonate mounds, some Lophelia reef - NB the majority of the images from this dive are blurry so screenshots were used as example images. 		

DIVE SUMMARY	
DIVE #	TRANSECT #
452	4

	Start	End
Date & Time	05/07/2017 02:52:12	05/07/2017 06:28:59
Latitude/ Longitude	53.6886, -14.134118	53.67009317, -14.15369733
Depth	716m	667m
Images	3205-3262	
Samples	2x Push cores, ~10x Cidaris cidaris, 6x Lophelia pertusa, 2x Madrepora oculata (13 events)	

Location	SE of C13, NW Porcupine Bank SAC
Target Features	Escarpment
Depth Range	667m-731m



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The dive starts on flat mud/sand sediment with rare cobbles and boulders hosting *Plobrothus* sp (Hydrozoa) and discrete *Lophelia pertusa* colonies (M.AtMB.Sa.UrcCom, (sparse) M.AtMB.Ro.MixCor.DisLop)

Top R. More than half of the dive is spent on flat mud/sand with *Areosoma fenestratum* and *Cidaris cidaris* urchins and some lebensspuren. (M.AtMB.Sa.UrcCom) This later gently inclines with some added pebbles.

Bottom L. The slope proceeds up to an area of cobbles and boulders with discrete coral colonies dominated by *Lophelia pertusa* (M.AtMB.Ro.MixCor.DisLop) still interspersed with the urchin biotope.

Bottom R. An area of carbonate escarpment is reached toward the end of the dive, forming horizontal ledges. Overhanging carbonate is dominated by *Desmophyllum cf dianthus* and discrete *L. pertusa* coral colonies ((canyon/escarpment variant) M.AtMB.Ro.MixCor.DisLop).

Summary Description (habitat transitions noted)	
<p>START OF HD VIDEO A 0m/02:52am [1]: The dive starts on flat soft muddy sediment with rare cobbles and boulders hosting <i>Pliobrothus</i> sp (Hydrozoa) and discrete <i>Lophelia pertusa</i> colonies. 34m [2]: With no further cobbles/boulders a flat area dominated by urchins occupies the majority of the dive, with END OF HD VIDEO A at 2h1m/04:54am. START OF HD VIDEO B 0m/04:54am by 16m the landscape starts to incline uphill with some pebbles in the sediment. 19m [3] The slope reaches an area of coarser sediment with rare cobbles and boulders becoming geogenic reef by 23m. This area is dominated by <i>Lophelia pertusa</i> interspersed with urchins on coarse sediment. 1h17m [4]: a carbonate slope with muddy veneer gives rise to and escarpment of horizontal ledges with overhanging shelves dominated by <i>Desmophyllum cf dianthus</i> and discrete <i>L.pertusa</i> colonies. Several clumps of snagged fishing gear are encountered here. 1h26m [5]: Proceed over the top of the carbonate escarpment feature, again meeting cobbles and boulders on coarse sediment with discrete <i>L. pertusa</i> colonies and urchins. The sediment quickly thins to mud/sand again and cobbles/boulders become sparse. 1h31m [6]: Back to soft sediment with urchins and a brief encounter with a small octopus before the ROV comes off bottom at END OF HD VIDEO B 1h33m/06:28am.</p>	

Physical Data			
Reef (types can be concurrent)	28% reef	28 % geogenic	
		0% biogenic	%living %dead
Substrates	- boulders - carbonate - cobbles - mud/sand - sand/coral gravel - sand/ pebbles - sand/shell hash		
Geomorphology/Features	Continental slope Escarpment - carbonate step - carbonate overhang		
Annex 1 Types	- Boulder/cobble fields - Horizontal ledges (carbonate)		
Pressures	- 3 Ropes - 4 Snagged fishing nets - 1 Possible snagged fishing net - 1 plastic		

Biological Data			
Number of Species		53 spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U.	Name	Size	SACFOR
250	Lophelia pertusa	L	C
251	Madrepora oculata	L	C
188	Araeosoma fenestratum	L	F
12	Bolocera tuediae	L	F
249	Lepidion eques	L	F
440	Synaphobranchus kaupii	L	F
211	Cidaris cidaris	M	F
207	Pliobrothus sp	M	F
265	Chimaera monstrosa	L	O
303	Coelorrhinchus coelorrhinchus	L	O
227	Helicolenus dactylopterus	L	O
1024	Hydrolagus cf mirabilis	L	O
349	Mora moro	L	O
1020	Phycis blennoides	L	O
1016	Trichiurus lepturus	L	O
4	Actiniaria sp 1	M	O
335	Desmophyllum cf dianthus	M	O
1003	Nezumia aequalis	M	O
252	Psolus squamatus	M	O
106	Serpulidae sp 1	M	O
32	Anomiidae sp 1	Mass	O
82	Cirripedia sp	Mass	O
478	Actiniaria sp 13 (pink/purple)	S	O
2	Ceriantharia	S	O
800	Porifera encrusting (blue)	Crust	R
1	Porifera encrusting sp 1 (white)	Crust	R
30	Porifera encrusting sp 10 (yellow)	Crust	R
105	Porifera encrusting sp 18 (cream)	Crust	R
1025	Beryx decadactylus	L	R
254	Chaceon affinis	L	R
1005	Galeus melastomus	L	R
315	Koehlermetra porrecta	L	R
273	Lophius piscatorius	L	R
1019	Merlangius merlangus	L	R
654	Molva molva	L	R
255	Phelliactis sp 1	L	R
1006	Actinopterygii sp 4	M	R
278	Anthomastus grandiflorus	M	R
20	Ascidiaeae sp 2	M	R
267	Bonellia viridis	M	R
1077	Caridea (indet)	M	R
388	Ceramaster/Peltaster/Plinthaster s	M	R
445	Echinus sp 1	M	R
973	Graneledone verrucosa	M	R
208	Henricia sanguinolenta	M	R
50	Hydrozoa (bushy)	M	R
458	Pachycerianthus multiplacatus	M	R
433	Pseudarchaster sp 1	M	R
204	Reteporella sp 1	M	R
54	Sabellidae sp 1	M	R
1017	Teuthidae (indet)	M	R
43	Corallimorphidae sp 2	S	R
205	Paguridae spp	S	R

Biotope List (Marine Habitat Classification for Britain & Ireland)			
Code	Name	Listed	
M.AtMB.Sa.UrcCom (and Coarse sediment variant)	Urchin dominated community on Atlantic mid bathyal sand		

M.AtMB.Ro.MixCor.DisLop (and canyons/escarpment variant)	Discrete Lophelia pertusa colonies on Atlantic mid bathyal rock and other hard substrata (The dominance of <i>Desmophyllum cf dianthus</i> may be particular to canyons/escarpments)	Coral gardens (OSPAR/ICES); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
(var) M.AtMB.Ro.MixCor (.HydBry)	(variant of) Mixed cold water coral community on Atlantic mid bathyal rock and other hard substrata (with dominant Hydrozoans and Bryozoans)	Coral gardens (OSPAR/ICES); Hard-bottom coral garden: Stylasterid corals on hard substrata /Colonial scleractinians on rocky outcrops (ICES subcategory mix)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtMB.Sa.UrcCom, (sparse) M.AtMB.Ro.MixCor(.HydBry) 188 Araeosoma fenestratum, 207 Pliobrothus	
2	M.AtMB.Sa.UrcCom 188 Araeosoma fenestratum, 211 Cidaris cidaris	
3	(var) M.AtMB.Sa.UrcCom, M.AtMB.Ro.MixCor.DisLop 250 Lophelia pertusa	
4	(var) M.AtMB.Sa.UrcCom, (var) M.AtMB.Ro.MixCor.DisLop 335 Desmophyllum cf dianthus, 211 Cidaris cidaris	
5	M.AtMB.Sa.UrcCom, M.AtMB.Ro.MixCor(.HydBry) 207 Pliobrothus, 211 Cidaris cidaris	
6	M.AtMB.Sa.UrcCom 188 Araeosoma fenestratum	

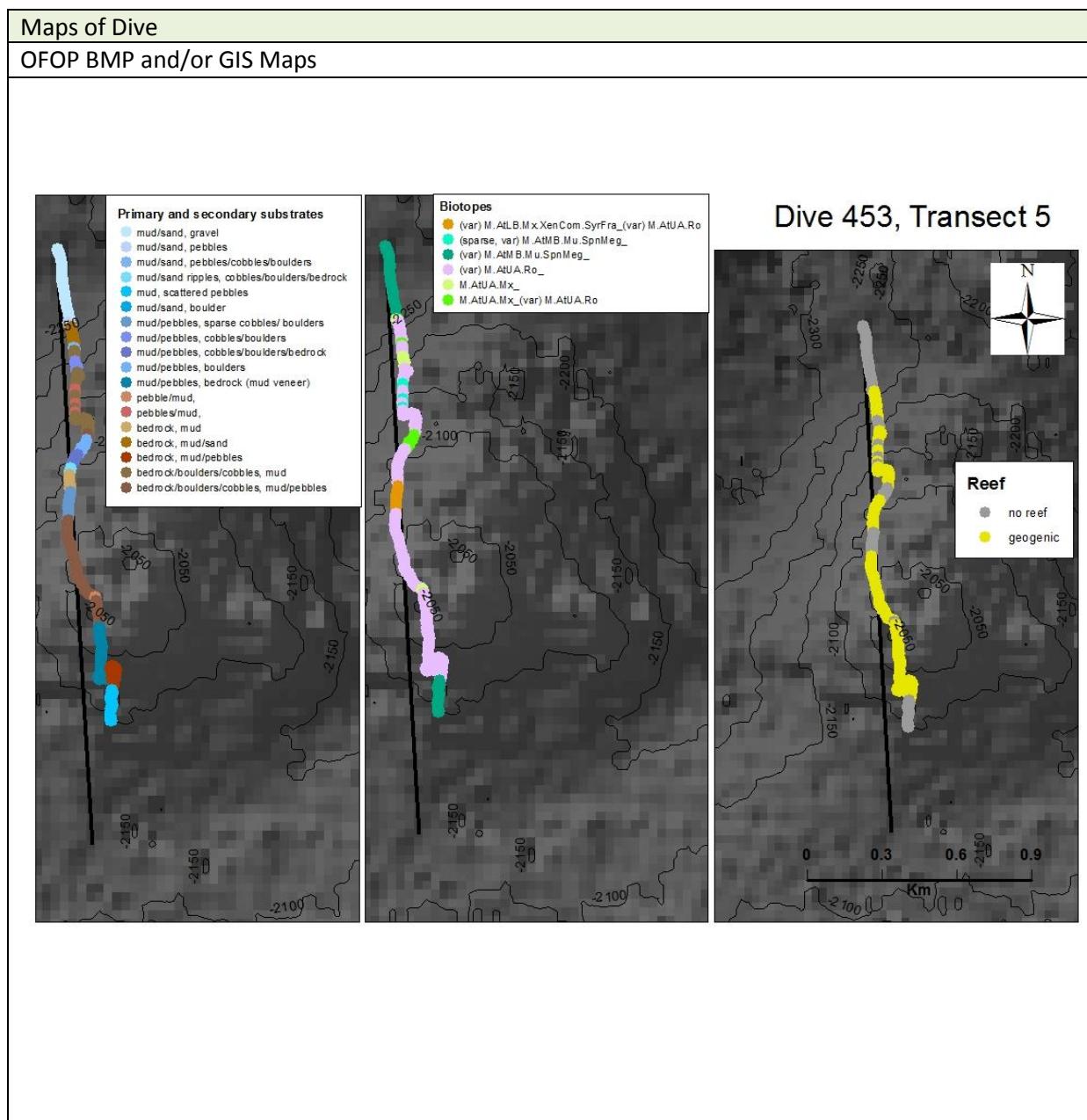
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens	- Hard-bottom coral garden: Colonial scleractinians on rocky outcrops - Hard-bottom coral garden: Stylasterid corals on hard substrata	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
- <i>Pliobothrus</i> sp dominated community highlighted due to its similarity to others observed along similar escarpment feature dives (see transects 42, 50, 51)		

DIVE SUMMARY	
DIVE #	TRANSECT #
453	5

	Start	End
Date & Time	05/07/2017 11:51:10	05/07/2017 15:20:57
Latitude/ Longitude	54.07462117, -13.90515967	54.06019167, -13.902694
Depth	2264.72	2107.02
Images	IMG_3301-IMG_3397.JPG	
Samples	Geodia, Bubble sponge, Keratoisis, Zoanthidea	

Location	NW of C12
Target Features	(Carbonate?) Mound
Depth Range	1962.27-2266.48m (av2117.320m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Between areas of bedrock/cobbles/boulders there are slopes of mud overlaid with pebbles encircling small mole-hill-like mud mounds. This is assumed to be indicative of the underlying geology. These areas often display sparse sea pens.

Top R. Some areas are dominated by large lobose glass sponges (*Rhabdodictyum cf. delicatum*, OTU611) and fine branching isidsids (possibly *Keratoisis* sp, OTU1157).

Bottom L. When closer to the hard substrate the number of Bathycrinidae sp stalked crinoids becomes apparent. Here seen also with a yellow *Anachalipsicrinus nefertiti* stalked crinoids, a yellow *cf Rhabdodictyum* sp sponge, and a chrysogorgiid coral (OTU1008) in the background.

Bottom R. Near the summit of the mound the community was dominated by *Geodia cf. baretti* (OTU601) barrel sponges, and Chrysogorgiid corals (OTU1008), along with other mixed corals and sponges.

Summary Description (habitat transitions noted)

HD VIDEO A 0m/11:51am [1] The transect starts on relatively flat mixed mud/sand and gravel/increasing pebbles with sparse cf *Anthoptilum sp* (OTU1107) sea pens. **17m [2]** protruding bedrock hosts mixed stalked crinoids and a geodid sponge (OTU601) which at 22m is sampled. **25m [3]** the ROV continues uphill over mud and pebbles until **27m [4]** encountering more flat/sloping protruding bedrock with stalked crinoids and sparse sponge and coral fauna. 28m-32m stopped for imagery. 39m-52m stopped for imagery, aborted sampling, and sampling of "bubble" lamellate sponge (OTU1156). **54m [5]** ROV continues up mud slope with pebbles and cobbles and occasional boulders colonised by *Anachalypsicrinus nefertiti*. **55m [6]** more protruding bedrock and cobbles/boulders colonised by stalked crinoids, sponges, and corals. 55m-1h00m ROV stops for imagery of a large (>1m) lamellate glass sponge (cf Hexactinosida, OTU1151), 1h02m-1h03m ROV stopped for imagery of a large branching *Parantipathes* black coral. 1h04m-1h06m ROV stopped for imagery of a *Rhabdodictyum cf delicatum* (OTU611) glass sponge and stalked crinoids. **1h07m [7]** more mud slope with sparse cobbles, the pebble/gravel overlay often forming rings around "mud mounds", presumably highlighting rock protrusions beneath the sediment. **1h10m [8]** ROV skirts the edge of flat bedrock protrusions with pebble overlaid mud with stalked crinoids, and sparse corals/sponges. 1h11m-1h14m stopped for imagery before proceeding uphill diagonally right towards more bedrock protrusions, here *Anachalypsicrinus nefertiti* and *Rhabdodictyum cf delicatum* dominate the bedrock islands, interspersed with pebbles/mud. **1h17m [9]** and exteneded upslope of mud with pebbles, mud mounds and sparse mixed sea pens. **1h19m [10]** bedrock protrusions with large *Rhabdodictyum cf delicatum* and *A. nefertiti*. **1h20m [11]** mud/pebbles/mud mounds, and sparse cobbles and sea pens. **1h21m [12]** *Rhabdodictyum cf delicatum* /*A. nefertiti* /mixed corals on bedrock. **1h22m [13]** pebbles/mud/mud mounds and sparse seapens. **1h23m [14]** *Rhabdodictyum cf delicatum* /*A. nefertiti* /mixed corals on bedrock and now also with fine branching bamboo corals (possibly *Keratoisis sp*, OTU1157) in increasing density. 1h24-1h26m stopped for imagery, 1h27m ROV turns left then continues, 1h32m-1h35m stopped for imagery. 1h35-1h39m sampling Keratoisis (OTU1157), 1h41-1h46m stopped for imagery and sampling zoanthids. **1h50m [15]** mud/pebble slope, mud mounds, some patchy sea pens and xenophyophores, and a couple of boulders dominated by stalked crinoids. 1h52m-1h57m stoipped for imagery of boulders. **END OF HD VIDEO A 1h58m/13:49pm. START OF HD VIDEO B 0m/13:50pm.** Continue diagonally upslope until **2m [16]** bedrock protrusions and boulders with *Rhabdodictyum cf delicatum* /*A. nefertiti*. 7m a large ray is encountered. Continue upslope, fairly steep until flattens out at 14m. **16m [17]** mud/pebbles, some ripples, with sparse cobbles/boulders, xenophyophores on the mixed sediment and stalked crinoids on hard substrate. **22m [18]** increasingly dense corals and sponges on bedrock/boulders, at first *Rhabdodictyum cf delicatum* and *Keratoisis sp* dominate. 36m-39m ledge feature, stopped for imagery. 42m dense mixed corals and sponges, (42m-53m many elasmobranch egg cases visible lying on the seabed between corals and sponges). 45m still dense mixed corals and sponges, now chrysogorgiid corals (OTU1008) and *Geodia cf baretti* (OTU601) sponges dominate. **46m [19]** another patch of pebbles/mud before **47m [20]** again dense mixed corals and sponges. This is the summit of the mound. 53m ROV proceeds over ledge feature with obscured/partial seabed views as going downhill. Continued dense sponges and corals apparent (especially *Rhabdodictyum cf delicatum* and *Keratoisis sp*). 56m now gentler downhill slope, mud veneered but rock protrusions many corals/sponges still present. 1h10m proceed over small ledge feature to soft sediment where vision becomes obscured and ROV turns ~90° and tries to escape mud cloud. 1h15m ROV heading up hill, too high off seabed, substrate sloping bedrock with mud veneer and some pebbles. Sparse corals and sponges. 1h17m vision again obscured by mud cloud, ROV turns 180° and continues downhill with vision obscured until **1h21m [21]** relatively flat mud bottom with scattered pebbles and sparse sea pens. 1h28m ROV stops. **HD VIDEO B ENDS 1h30m/15:20pm.**

Physical Data			
Reef (types can be concurrent)	75 % reef	75 % geogenic	
		n/a	n/a
		n/a	
Substrates	<ul style="list-style-type: none"> - bedrock - boulders - cobbles - gravel - mud - mud/pebbles - mud/sand - pebbles 		
Geomorphology/Features	<p>(Volcanic?) Mound</p> <ul style="list-style-type: none"> - mud mounds - summit 		
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder field - sloping bedrock - horizontal bedrock 		
Pressures	n/a		

Biological Data			
Number of Species		79spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U.	Name	Size/Growth	SACFOR
1031	Anachalypsicrinus nefertiti	L	C
1041	Bathyocrinidae sp 1	L	C
1157	Keratoisis sp (fine branching)	L	C
611	Rhabdodictyum cf delicatum	L	C
1008	Chrysogorgiidae sp 1	L	F
551	Ophiomuseum lymani	L	F
601	Porifera massive globose sp 11 cf Geodia baretti	L	F
131	Crinoidea sp 1	M	F
650	Asconema sp (Porif mass glob 14)	L	O
1045	Bathyocrinidae sp 2 cf Porphyrocrinus thalassae	L	O
1107	cf Anthoptilum sp	L	O
1142	cf Farreidae sp	L	O
1059	Colossendeis sp	L	O
1105	Coryphaenoides armatus	L	O
577	Coryphaenoides guentheri	L	O
1154	Henricia sp (deep)	L	O
274	Hymenodiscus coronata/ Brisinga endacanemos	L	O
305	Leiopathes sp	L	O
1160	Lepidion guentheri	L	O
557	Lepidisis sp	L	O
1161	Parantipathes sp (branched)	L	O
1042	Parantipathes sp (unbranched)	L	O
552	Polyacanthonotus rissoanus	L	O
263	Porania pulvillus (poss stormi)	L	O
535	Porifera cup 2	L	O
1075	Porifera cylindrical sp	L	O
1156	Porifera lamellate (bubbles)	L	O
606	Porifera lamellate sp 9	L	O
616	Porifera massive lobose sp 22 (yellow cf Rhabdodictyum sp)	L	O
83	Porifera massive lobose sp 6 (cf Geodia)	L	O
547	Stauropathes arctica	L	O
1043	Telopathea sp	L	O
261	Syringammina fragilissima	M	O
1149	Zoanthidea sp (sweetcorn)	Mass	O
1076	Ophiozoidea (indet)	S	O
1	Porifera encrusting sp 1 (white)	Crust	R
554	Actinernus sp	L	R
1047	Actinoscyphidae sp 1 (pink)	L	R
132	Actinostolidae sp 1	L	R
284	Bathypathes sp (brown)	L	R
572	Echinothuroidea sp (whiteDeep)	L	R
1163	Geodia sp (warty)	L	R
432	Holothuroidea (cf Laetmogone) (purple)	L	R
1039	Hydrolagus cf affinis	L	R
1039	Hydrolagus cf affinis (*poss H. pallidus)	L	R
578	Keratoisis sp 2	L	R
1009	Notacanthidae sp 1 (Notacanthus cheminizii)	L	R
1153	Oneirophanes mutabilis	L	R
1050	Paramuricea sp	L	R
1046	Pennatula aculeata	L	R
1165	Plexauridae sp (rigidFan)	L	R
1146	Poecilosclerida sp	L	R
1030	Polymastia cf boleiformis	L	R
1151	Porifera lamellate (Hexactinosida)	L	R
1159	Rajiformes (indet)	L	R
573	Solaster endeca	L	R
581	Umbellula sp	L	R
605	Actiniaria sp 20	M	R
930	Actinopterygii sp 3	M	R
1066	Adamsia sp (Paguridae Associated)	M	R
278	Anthomastus grandiflorus	M	R
1152	Anthoptilum sp (rockPen)	M	R
146	Aphroditidae sp 1	M	R
1077	Caridea (indet)	M	R
1058	Caryophyllidae/Fabellidae (indet)	M	R
2	Ceriantharia	M	R
1054	Chiostylidae (indet)	M	R
559	Echinidae sp (white)	M	R
1122	Elpidiidae (indet)	M	R
1138	Eucaridea sp (redDeep)	M	R
1056	Flabellum sp	M	R
1144	Galatheoidea sp	M	R
1002	Goniasteridae sp	M	R
1154	Henricia sp (deep)	M	R
628	Holothuroidea sp 4 (cf Amperima)	M	R
536	Mesothuria intestinalis	M	R
1126	Munnidopsis sp	M	R
205	Paguridae spp	M	R
311	Anthothelia grandiflora	Mass	R
289	cf Clavulariidae sp	Mass	R

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtLB.Mx.XenCom.SyrFra	(upper abyssal variant) Syringamma fragilissima field on Atlantic lower bathyal mixed sediment	Mud and sand emergent fauna (ICES)
(var) M.AtMB.Mu.SpnMeg	(upper abyssal, coarse variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
(var) M.AtUA.Ro	(Stalked crinoids, sponges, and corals on) Atlantic upper abyssal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard- bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory); Deep- sea sponge aggregations (ICES/OSPAR); Hard- bottom sponge aggregations (ICES subcategory)
M.AtUA.Mx	Atlantic upper abyssal mixed sediment	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtMB.Mu.SpnMeg 1107 cf Anthoptilum sp	
2	(var) M.AtUA.Ro 1041 Bathycrinidae sp 1	
3	M.AtUA.Mx no dominant spp	
4	(var) M.AtUA.Ro 1041 Bathycrinidae sp 1	
5	M.AtUA.Mx, (var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti	
6	(var) M.AtUA.Ro 1041 Bathycrinidae sp 1, 611 Rhabdodictyum Sp (Porif mass lob 21)	
7	M.AtUA.Mx no dominant spp	
8	(var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti, 611 Rhabdodictyum Sp (Porif mass lob 21), 1041 Bathycrinidae sp 1	
9	(sparse, var) M.AtMB.Mu.SpnMeg no dominant spp	
10	(var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti, 611 Rhabdodictyum Sp (Porif mass lob 21)	
11	(sparse, var) M.AtMB.Mu.SpnMeg no dominant spp	
12	(var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti, 611 Rhabdodictyum Sp (Porif mass lob 21)	

13	(sparse, var) M.AtMB.Mu.SpnMeg no dominant spp
14	(var) M.AtUA.Ro 1031 Anachalypsirinus nefertiti, 611 Rhabdodictyum Sp (Porif mass lob 21), 1157 Keratoisis sp (fineBranching)
15	M.AtUA.Mx, (var) M.AtUA.Ro 1031 Anachalypsirinus nefertiti, 261 Syringammina fragilissima, 1107 cf Anthoptilum sp
16	(var) M.AtUA.Ro 1031 Anachalypsirinus nefertiti, 611 Rhabdodictyum Sp (Porif mass lob 21)
17	(var) M.AtLB.Mx.XenCom.SyrFra, (var) M.AtUA.Ro 261 Syringammina fragilissima, 1041 Bathycrinidae sp 1
18	(var) M.AtUA.Ro 1008 Chrysogorgidae sp 1, 601 Geodia cf baretti (Porifera massive globose sp 11), 1031 Anachalypsirinus nefertiti, 611 Rhabdodictyum Sp (Porif mass lob 21), 1157 Keratoisis sp (fine branching)
19	M.AtUA.Mx no dominant spp
20	(var) M.AtUA.Ro 1157 Keratoisis sp (fine branching), 1008 Chrysogorgidae sp 1, 601 Geodia cf baretti (Porifera massive globose sp 11), 611 Rhabdodictyum Sp (Porif mass lob 21)
21	(var) M.AtMB.Mu.SpnMeg 1107 cf Anthoptilum sp

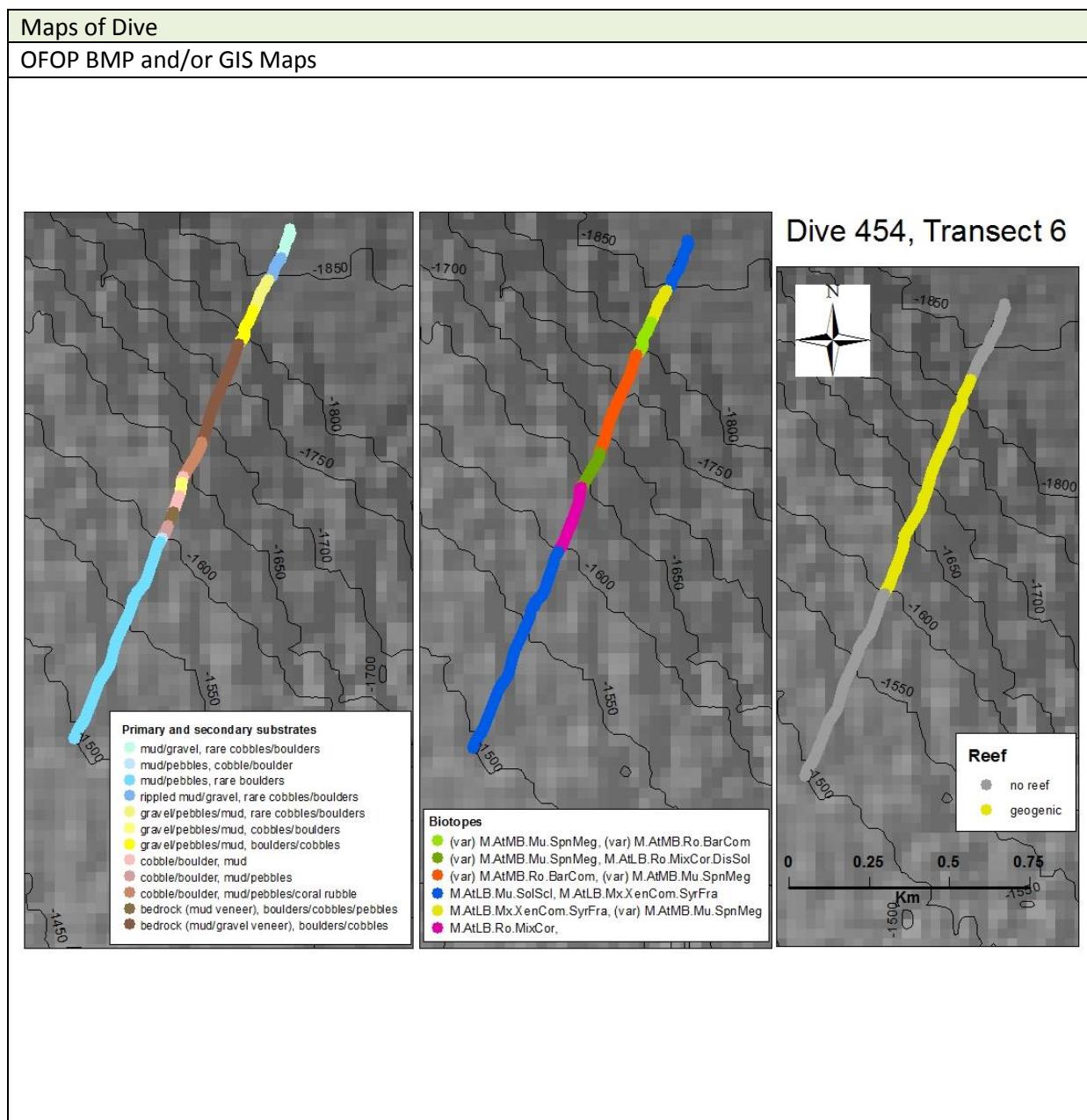
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens	ICES/OSPAR	
- Hard-bottom coral garden:	ICES subcategory	
○ Hard-bottom gorgonian and black coral gardens	ICES subcategory	
Deep-sea sponge aggregations	ICES/OSPAR	
- Hard-bottom sponge aggregations	ICES subcategory	
Mud and sand emergent fauna	ICES	
Sea-pen and burrowing megafauna communities	OSPAR	
Seapen fields	ICES	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - This transect is outstanding in its difference to the other communities encountered throughout this survey (and others known in this region). There are many species which were rarely encountered, and the corals and sponges are mature and in high density. The rarity of this community is likely due to there being very few dives at equivalent depth, and on hard substrate, with which to compare it to (in this survey or others known to the authors of this report). Similar upper abyssal rock features should be targeted in future surveys in order to better characterise this community and its rarity. - Around 30 elasmobranch egg cases are visible on the seabed amongst dense corals and sponges between 42m-53m (HD VIDEO B). It is unknown what species laid them. 		

DIVE SUMMARY	
DIVE #	TRANSECT #
454	6

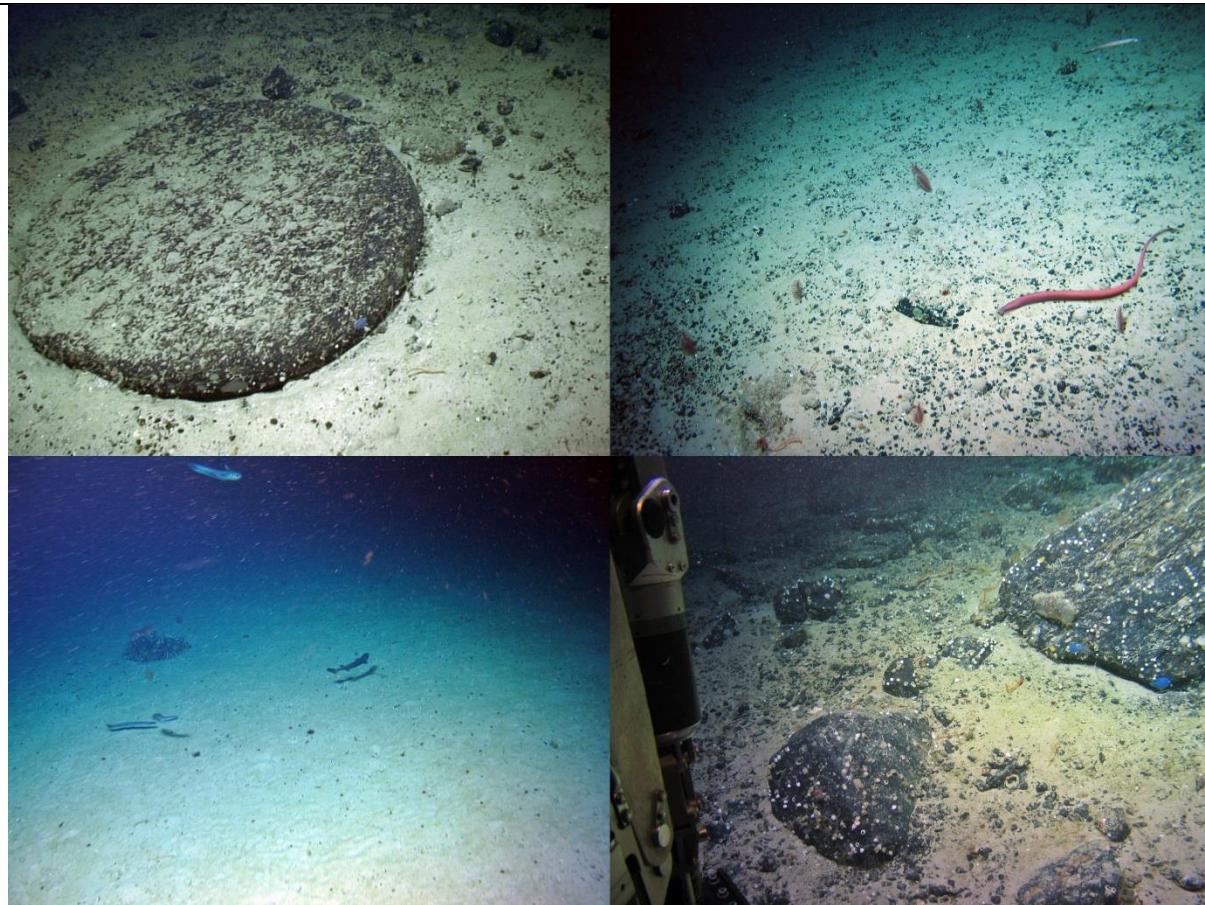
	Start	End
Date & Time	05/07/2017 20:08:18	05/07/2017 22:07:03
Latitude/ Longitude	53.98744117, -13.65765133	53.974319, -13.66757333
Depth	1848.81m	1489.81m
Images	IMG_3398-IMG-3464.JPG	
Samples	n/a	

Location	C12
Target Features	Canyon, Escarpment
Depth Range	1489.55m-1848.81m (av 1676.274m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The interesting circular boulder, colonised by the orange uncoiled *Stichopathes sp* (OTU560)

Top R. Seapens (*Pennatula acculeata*) on mixed pebbles/mud sediment were encountered throughout the dive. Some *Stichopathes sp* (OTU560) can also be seen, arising from either a pebble or the underlying veneered bedrock. This mixed substrate in varying density was encountered throughout the duration of the transect.

Bottom L. The start and end of this dive were spent over epifaunally rich mud with scattered pebbles and rare boulders/cobbles. Cup corals and xenophyophores (*Syringammina fragilissima*) dominate these areas, along with sea pens at the deeper start point, or *Acanella arbuscula* (seen here) at the end of the dive. This end point was also well populated with fish species, especially *Coryphaenoides rupestris* and a few sharks (Squaliformes).

Bottom R. Barnacles dominated most of the boulders and cobbles encountered throughout this dive. Other encrusting fauna were also present however, along with *Stichopathes sp* (OTU560).

Summary Description (habitat transitions noted)			
<p>HD VIDEO STARTS AT 0m/20:08pm [1] The dive starts on mixed epifaunally rich mud/gravel dominated by cup corals and xenophyophores. 1m The ROV traverses right then moves forward again. 5m view obscured for 20s. The substrate becomes rippled with increasing gravel and pebbles.</p> <p>11m [2] the xenophyophores now dominate, along with sea pens, especially <i>Pennatula acculeata</i> on gravel/pebble/mud with rare cobbles and boulders. 17m [3] the slope becomes steeper, boulders and cobbles are more common, the seapens are generally dominant, occupying the soft/mixed substrate, while barnacles occupy the hard substrate. Other encrusting fauna and some corals are also present. 22m A large dark jellyfish is encountered. 23m [4] A large flat circular boulder is encountered. The barnacles are now the dominant assemblage with many black corals <i>Stichopathes sp</i> (OTU560) apparent upon closer inspection. <i>P. acculeata</i> continues on the softer substrate, although some <i>Stichopathes</i> are also seen here, attached either to pebbles or indicative of veneered bedrock. The cobbles/boulders and mixed substrate occur in patches of varying density. 50m stop to image <i>Leiopathes</i>, circling afterwards before continuing uphill at 58m. 1h00m [5] cobbles/boulders are relatively dense with some coral rubble and discrete living <i>Solenosmilia variabilis</i> colonies associated, along with other sparse mixed corals. The barnacles are still numerous, and pens continue on the mixed substrate. 1h08m [6] This area is dominated by <i>Stichopathes sp</i>, at first also accompanied by a massive globose/lobose sponge (possibly <i>Geodia sp</i>, OTU83). The mixed substrate patches are also dominated by <i>Stichopathes</i> with few sea pens, so this is likely thinly veneered bedrock. 1h17m Terraced cliffs of vertical/horizontal bedrock, mud veneer, and cobbles/boulders on terraces, continue with a similar assemblage. 1h21m ROV reaches the top terrace which supports a cobble/boulder field at first, with increasing pebble/mud veneer. 1h25m [7] cup corals and xenophyophores again dominate, now with frequent <i>Acanella arbuscula</i>. There are many fish species up here, with several sharks (Squaliformes) encountered and <i>Coryphaenoides rupestris</i> being particularly abundant. A couple of <i>Radicipes sp</i> chrysogorgiid corals were also encountered. HD</p> <p>VIDEO ENDS AT 1h58m/22:07pm.</p>			

Physical Data					
Reef (types can be concurrent)	58% reef	58 % geogenic			
		n/a	n/a		
Substrates		<ul style="list-style-type: none"> - bedrock - boulders - cobbles - coral rubble - gravel - mud - pebbles 			
Geomorphology/Features	Canyon <ul style="list-style-type: none"> - circular boulder Escarpment <ul style="list-style-type: none"> - terraced cliffs Interfluve				
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder fields - horizontal bedrock - sloping bedrock - vertical bedrock 				
Pressures	<ul style="list-style-type: none"> - 1 x rubber/plastic 				

Biological Data				
Number of Species		81spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U	Name	Size/Growth	SACFOR	
82	Cirripedia sp	Mass	A	
1046	Pennatula acculeata	L	C	
560	Stichopathes sp	L	C	
585	Acanella arbuscula	L	F	
566	Coryphaenoides rupestris	L	F	
551	Ophiomuseum lymani	L	F	
83	Porifera massive lobose sp 6 (cf Geodia)	L	F	
1041	Bathycrinidae sp 1	M	F	
1058	Caryophyllidae/Fabellidae (indet)	M	F	
261	Syringammina fragilissima	M	F	
132	Actinostolidae sp 1	L	O	
20	Ascidiae sp 2	L	O	
284	Bathypathes sp (brown)	L	O	
1105	Coryphaenoides armatus	L	O	
577	Coryphaenoides guentheri	L	O	
572	Echinothuriidea sp (whiteDeep)	L	O	
432	Holothuroidea (cf Laetmogone) (purple)	L	O	
651	Hoplostethus atlanticus	L	O	
274	Hymenodiscus coronata/ Brisina endacnemoid	L	O	
1064	Isididae sp (fine branching)	L	O	
578	Keratoisis sp 2	L	O	
305	Leiopathes sp	L	O	
1160	Lepidion quentheri	L	O	
557	Lepidisis sp	L	O	
563	Neocytthus helgae	L	O	
1050	Paramuricea sp	L	O	
1042	Parantipathes sp (unbranched)	L	O	
436	Pentametrocrinus atlanticus	L	O	
552	Polyacanthonotus rissoanus	L	O	
263	Porania pulvillus (poss stormi)	L	O	
1075	Porifera cylindrical sp	L	O	
1010	Porifera lamellate sp 12 (solen Assoc)	L	O	
1044	Radicipes cf gracilis	L	O	
700	Solenosmilia variabilis	L	O	
569	Squaliformes sp	L	O	
547	Stauropathes arctica	L	O	
440	Synaphobranchus kaupii	L	O	
581	Umbellula sp	L	O	
4	Actiniaria sp 1	M	O	
605	Actiniaria sp 20	M	O	
2	Ceriantharia	M	O	
800	Porifera encrusting (blue)	Crust	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
30	Porifera encrusting sp 10 (yellow)	Crust	R	
608	Acanthogorgia cf armata	L	R	
554	Actinernus sp	L	R	
1047	Actinoscyphiidae sp 1 (pink)	L	R	
1107	cf Anthoptilum sp	L	R	
1008	Chrysogorgiidae sp 1	L	R	
1059	Colossendeis sp	L	R	
1100	Conger conger	L	R	
128	Cottunculus microps	L	R	
1015	Dendrobathyphathes sp	L	R	
649	Eknomisis sp	L	R	
622	Halipterus cf finmarchica	L	R	
1113	Halosauridae sp	L	R	
1194	Mussoctopus johnsonianus	L	R	
1009	Notacanthidae sp 1 (Notacanthus cheminizii)	L	R	
1146	Poecilosclerida sp	L	R	
1128	Porifera globose (muddy)	L	R	
623	Porifera lamellate sp 10 (YellowSolenoAssoc)	L	R	
606	Porifera lamellate sp 9	L	R	
380	Porifera tubular (cf Asconema foliatum)	L	R	
1159	Rajiformes (indet)	L	R	
573	Solaster endeca	L	R	
930	Actinopterygii sp 3	M	R	
146	Aphroditidae sp 1	M	R	
471	Asteronyx loveni	M	R	
1077	Caridea (indet)	M	R	
6	Caryophyllia sp	M	R	
584	Caryophyllia sp 5 (bullseye)	M	R	
1054	Chirostylidae (indet)	M	R	
113	Colus sp	M	R	
131	Crinoidea sp 1	M	R	
1052	Gracilechinus cf alexandri	M	R	
1166	Guttigadus latifrons	M	R	
536	Mesothuria intestinalis	M	R	
1126	Munnidopsis sp	M	R	
1076	Ophiuroidea (indet)	M	R	
1134	Scyphozoa sp (indet)	M	R	
106	Serpulidae sp 1	M	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Mu.SolScl	Solitary scleractinian field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Cup-coral fields (ICES subcategory)
M.AtLB.Mx.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mixed sediment	Mud and sand emergent fauna (ICES)
(var) M.AtMB.Mu.SpnMeg	(lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES);
(var) M.AtMB.Ro.BarCom	(lower bathyal variant) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
M.AtLB.Ro.MixCor.DisSol	Discrete Solenosmilia variabilis colonies on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.SolScl, M.AtLB.Mx.XenCom.SyrFra 1058 Caryophyllidae/Flabellidae, 261 Syringammina fragilissima, 1046 Pennatula acculeata	
2	M.AtLB.Mx.XenCom.SyrFra, (var) M.AtMB.Mu.SpnMeg 261 Syringammina fragilissima, 1046 Pennatula acculeata	
3	(var) M.AtMB.Mu.SpnMeg, (var) M.AtMB.Ro.BarCom 1046 Pennatula acculeata, 82 Cirripedia sp, 261 Syringammina fragilissima	
4	(var) M.AtMB.Ro.BarCom, (var) M.AtMB.Mu.SpnMeg 82 Cirripedia sp, 1046 Pennatula acculeata, 560 Stichopathes sp	
5	(var) M.AtMB.Mu.SpnMeg, M.AtLB.Ro.MixCor.DisSol 84 Cirripedia sp, 1046 Pennatula acculeata, 700 Solenosmilia variabilis, 1058 Caryophyllidae/Fabellidae (indet)	
6	M.AtLB.Ro.MixCor	

	83 Porifera massive lobose cf Geodia sp, 560 Stichopathes sp
7	M.AtLB.Mu.SolScl, M.AtLB.Mx.XenCom.SyrFra
	1058 Caryophyllidae/Flabellidae (indet), 261 Syringammina fragilissima, 585 Acanella arbuscula

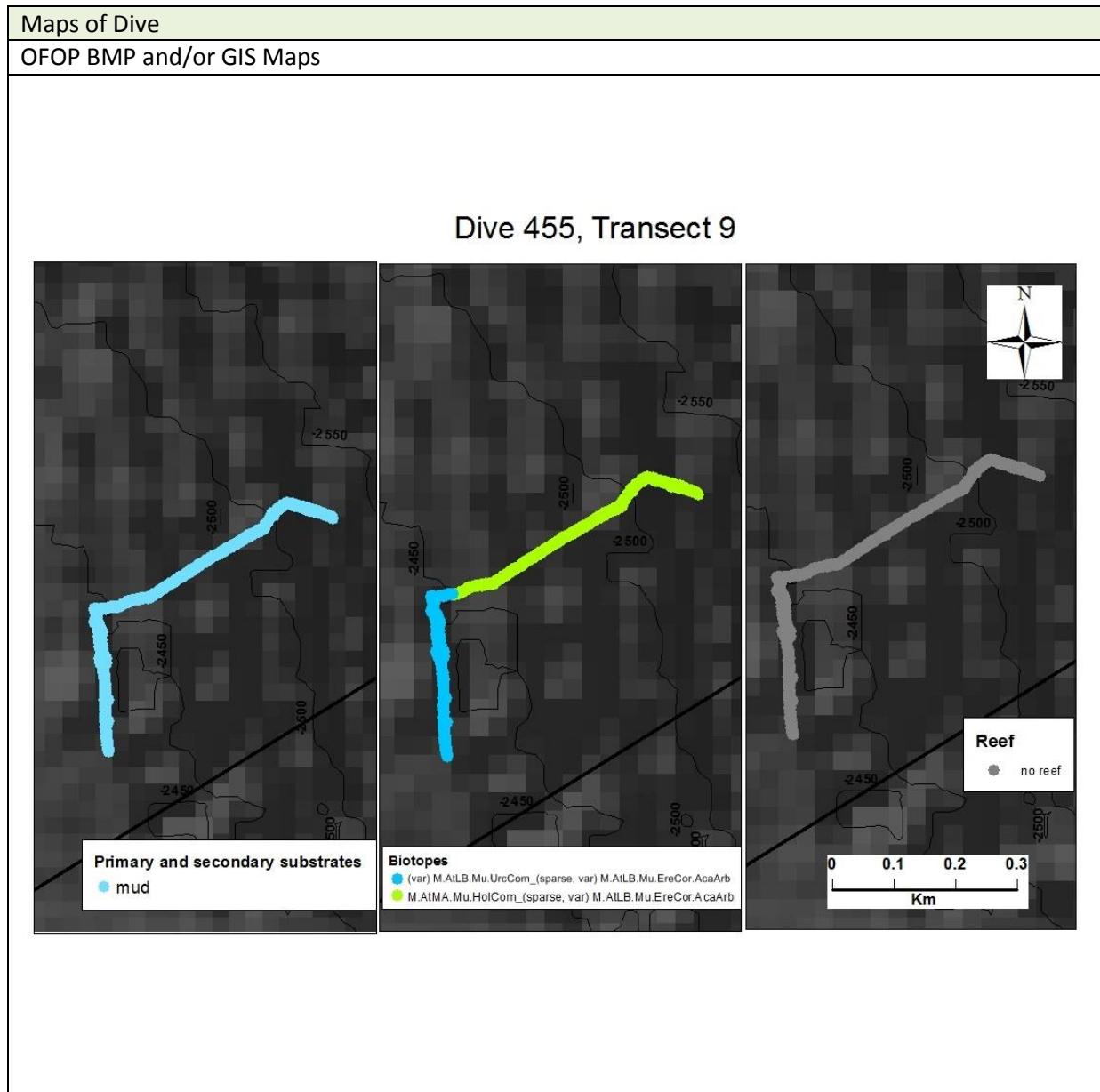
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral Gardens		
- Hard bottom coral garden	ICES/OSPAR	
o Hard-bottom gorgonian and black coral gardens	ICES subcategory	
o Colonial scleractinians on rocky outcrops	ICES subcategory	
- Soft-bottom coral garden	ICES subcategory	
o Cup-corals fields	ICES subcategory	
Mud and sand emergent fauna	ICES	
Sea-pen and burrowing megafauna communities	OSPAR	
Seapen fields	ICES	
Listed Species Encountered (Fish, Count)		
<i>Hoplostethus atlanticus</i>	3	IUCN/ OSPAR

Additional Comments		
<ul style="list-style-type: none"> - compare the epifaunally rich soft substrate (biotope transitions [1, 2, and 7] with transects 17, 25, and 26. 		

DIVE SUMMARY	
DIVE #	TRANSECT #
455	9

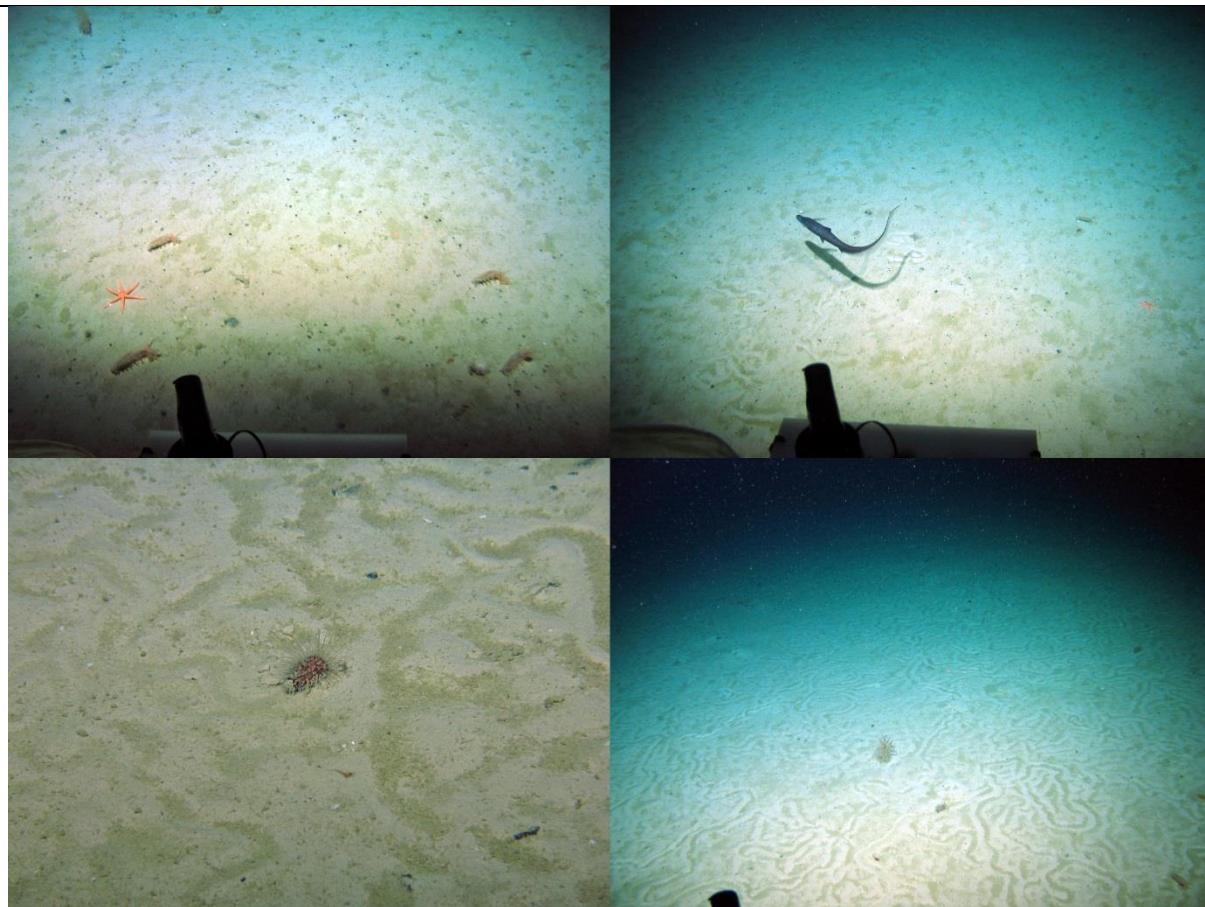
	Start	End
Date & Time	06/07/2017 17:26:16	06/07/2017 18:40:25
Latitude/ Longitude	54.21227833, -12.69359233	54.20863033, -12.69995583
Depth	2533.48	2427.2
Images	IMG_3501-IMG_3577.jpg	
Samples	1 x <i>Holasteroida sp</i>	

Location	C10
Target Features	Canyon (tributary), escarpment
Depth Range	2427.2m-2534.48m (av. 2645.715m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The start of the transect, which is entirely based on mud with flocculent detritus, is dominated by *Peniagone sp* holothurians but sparse *Acanella arbuscula* and other associated epifauna are also present including several *Amphaster alaminos* sea stars, and *Gracilechinus cf alexandri* urchins which later become co-dominant with the *Holasteroida sp*. (M.AtMA.Mu.HolCom, (sparse, var) M.AtLB.Mu.EreCor.AcaArb)

Top R. Several *Halosuridae sp* are encountered, including one juvenile (this image shows an adult).

Bottom L. The second half of the transect is dominated by these burrowing *Holasteroida sp* echinoids which are probably responsible for the majority of the tracks ((var) M.AtMA.Mu).

Bottom R. The obvious tracks of the *Holasteroida sp*, along with sparse *Acanella arbuscula*. ((var) M.AtMA.Mu, (sparse, var) M.AtLB.Mu.EreCor.AcaArb)

Summary Description (habitat transitions noted)

COMPOSITE VIDEO ON BOTTOM AT 17:26:16 [1] the whole transect occurs on mud with flocculent detritus apparent on its surface. Adult *Peniagone sp* holothurians dominate the first half of the transect, with *Acanella arbuscula* also sparsely distributed. Many of the other epifaunal species present similar to the lower bathyal *A. arbuscula* biotope, but there is only a low density of *A. arbuscula*. 17:28:14-17:28:58 ROV stops/goes slow. 17:35:23-17:35:32 ROV stops. 17:35:38-17:40:05 ROV moving jerkily and diagonally to the left, before resuming normal forward motion. **HD VIDEO STARTS AT 0m/17:42:06.** Continued *Peniagone sp* and sparse *A. arbuscula*. 11m increasing numbers of tracks (Lebensspuren). 15m35s *Holasteroida sp* urchins become co-dominant with *Peniagone sp*. **20m [2]** *Holasteroida sp* and their tracks dominate, sparse *A. arbuscula* continues. 22m stop for imagery for 30s. 23m: ROV turns left. 23m-24m stop. 28m back up and lateral right. 29m-31m stop for imagery (vision temporarily obscured). 35m-44m. Slow then stop for imagery and sampling of *Holasteroida sp* (vision temporarily obscured). 48m *Gracilechinus cf alexandri* co-dominant with *Holasteroida sp*. **HD VIDEO ENDS AT 58m/18:40:25.**

Physical Data			
Reef (types can be concurrent)	0% reef	n/a	
		n/a	n/a
			n/a
Substrates	- mud		
Geomorphology/Features	Canyon		
Annex 1 Types	n/a		
Pressures	n/a		

Biological Data				
Number of Species		34spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	F	
551	Ophiomuseum lymani	L	F	
1167	Peniagone sp	M	F	
1105	Coryphaenoides armatus	L	O	
1015	Dendrobathypathes sp	L	O	
1108	Distichoptilum gracile	L	O	
1113	Halosauridae sp	L	O	
1172	Macrouridae sp (cf Coelorhynchus)	L	O	
536	Mesothuria intestinalis	L	O	
1169	Psychropotes depressa	L	O	
1058	Caryophyllidae/Fabellidae (indet)	M	O	
1052	Gracilechinus cf alexandri	M	O	
1168	Holasteroida sp (fluffyUrchin)	M	O	
328	Bathypathes sp 1	L	R	
1170	Benthodytes sp	L	R	
1008	Chrysogorgiidae sp 1	L	R	
1059	Colossendeis sp	L	R	
577	Coryphaenoides guentheri	L	R	
274	Hymenodiscus coronata/ Brisingia	L	R	
1046	Pennatula acculeata	L	R	
581	Umbellula sp	L	R	
1143	Ampheraster alaminos	M	R	
1171	Asteroidea sp (pinkDeepSed)	M	R	
471	Asteronyx loveni	M	R	
584	Caryophyllia sp 5 (bullseye)	M	R	
2	Ceriantharia	M	R	
113	Colus sp	M	R	
131	Crinoidea sp 1	M	R	
1106	Eucaridea sp	M	R	
1056	Flabellum sp	M	R	
1110	Hymenaster cf pellucidus	M	R	
1076	Ophiuroidea (indet)	M	R	
1191	Pennatulacea sp (submergedAxial)	M	R	
433	Pseudarchaster sp 1	M	R	
1026	Mysida (indet)	S	R	
Biotope List (Marine Habitat Classification for Britain & Ireland)				
Code	Name	Listed		
M.AtMA.Mu.HolCom	Holothurian dominated community on Atlantic mid abyssal mud			
(sparse, var) M.AtLB.Mu.EreCor.AcaArb	(sparse, upper abyssal variant) <i>Acanella arbuscula</i> assemblage on Atlantic lower bathyal mud	Too sparse		
(var) M.AtLB.Mu.UrcCom	(Mid abyssal burrowing echinoid variant) Urchin dominated community on Atlantic lower bathyal mud			
Biotope progression per habitat transition (# species, dominant/characteristic species)				

1	M.AtMA.Mu.HolCom, (sparse, var) M.AtLB.Mu.EreCor.AcaArb 1167 Peniagone sp, 1168 Holasteroida sp
2	(var) M.AtMA.Mu, (sparse, var) M.AtLB.Mu.EreCor.AcaArb 1168 Holasteroida sp, 559 Gracilechinus acutus norvegicus

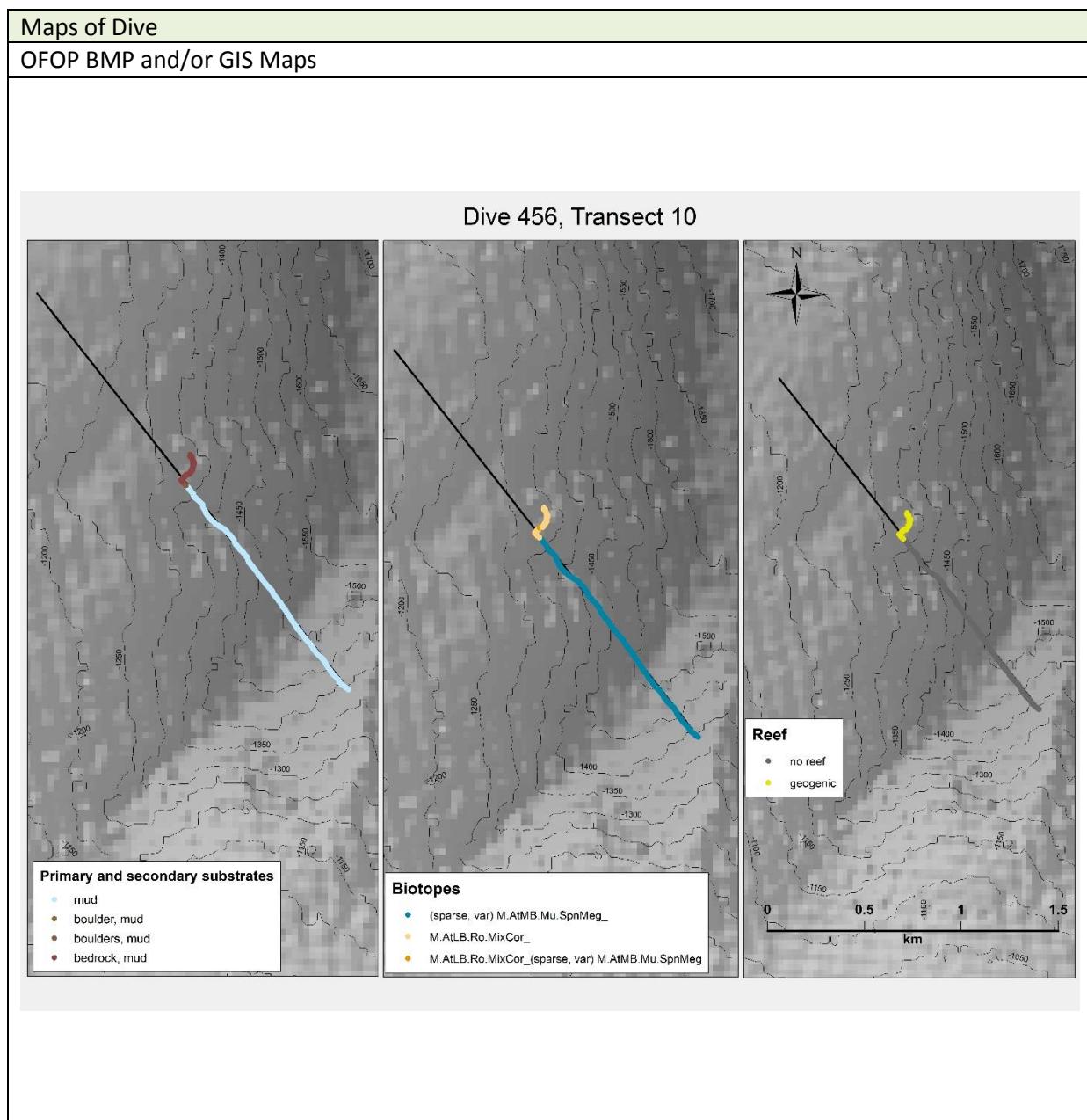
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
(Soft bottom coral garden too sparse)	n/a	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments	
<ul style="list-style-type: none"> - <i>Acanella arbuscula</i> biotope recorded due to similar associated species, but the density of <i>A. arbuscula</i> is low. - This transect was planned for a deeper depth than the ROV tether could stretch – something realised once the ROV was already down (end of tether reached at 15:49). The ROV therefore went along the planned transect through blue water until it met seabed at the depth it could reach. It was decided moving north of the line would allow it to reach seabed faster. Hence the deviation from the planned track. A couple of hours of transit through blue water preceded the seabed video. - The HD video is only 58mins long. There is an additional 20mins of seabed time prior to this on composite video only due to a failed restart of HD video recording. 	

DIVE SUMMARY	
DIVE #	TRANSECT #
456	10

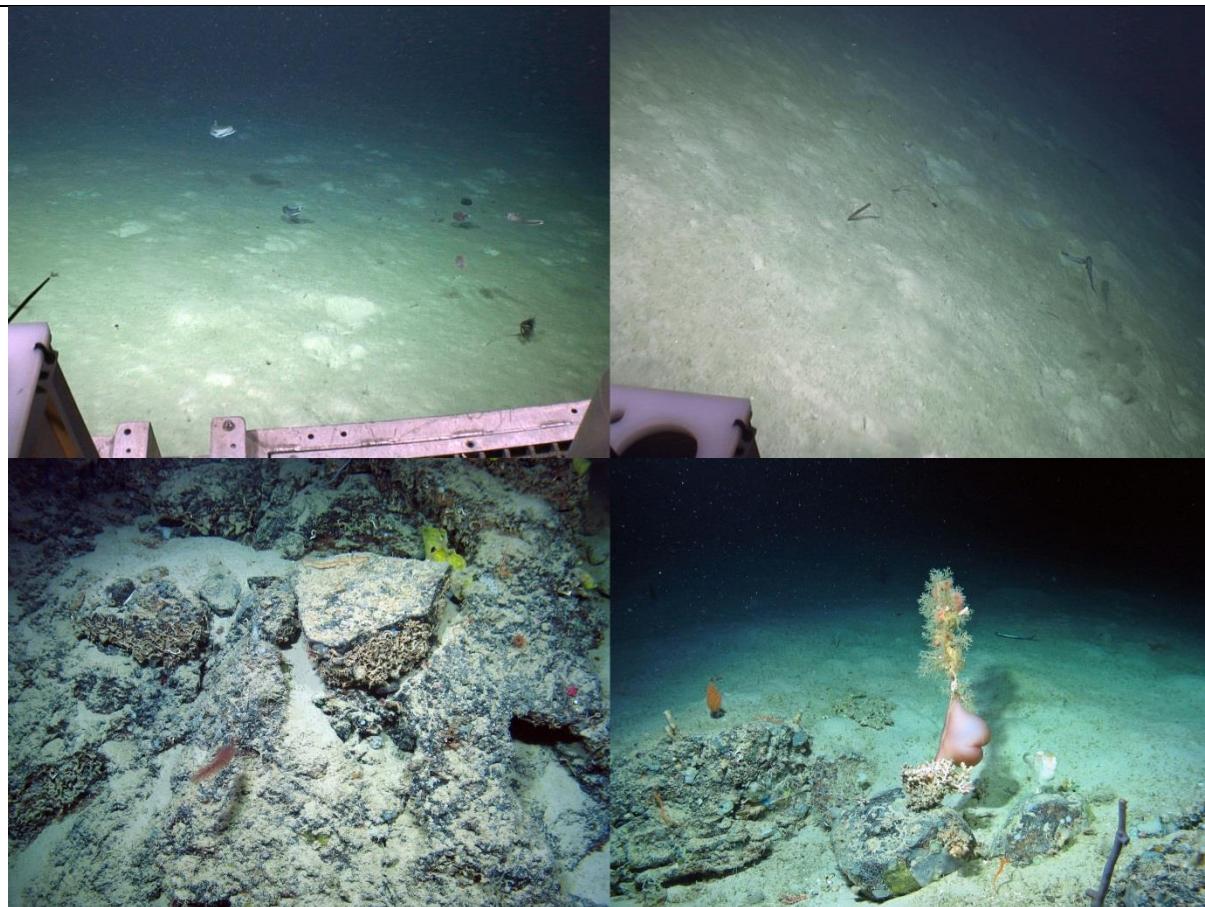
	Start	End
Date & Time	06/07/2017 23:43:47	07/07/2017 01:44:19
Latitude/ Longitude	54.0120895, -12.64410083	54.02289933, -12.655651
Depth	1354.57	1334.13
Images	IMG_3581-IMG_3618.jpg	
Samples	2 x pushcores	

Location	C10
Target Features	Canyon, Escarpment
Depth Range	1312.91m-1509.2m (av. 1397.412m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. More than half of this dive was spent on muddy substrate with sparse seapens and burrowing megafauna. Fish were abundant, especially *Coryphaenoides rupestris* and a 39 juvenile *Hoplostethus atlanticus*.

Top R. At times the seapens on mud occur on a steep slope.

Bottom L. The last third of the dive was spent on a bedrock escarpment (sloping/vertical) dominated by serpulid polychaetes, yellow lamellate sponges and *Stichopathes sp* (OTU560). Mixed corals and sponges colonised the area.

Bottom R. The ROV tracked along the edge of a bedrock terrace. Mixed corals are associated with the hard substrate, while the mud veneered terrace is colonised again by seapens and burrowing megafauna. Here an orange *Acanella arbcula* can be seen in the mud, with seapens in the background. An *Actinoscyphia sp* venus flytrap anemone is retracted and attached to a dead bamboo coral skeleton, along with branching hydroids, and a *Solenosmilia variabilis* colony at its base, while orange uncoiled *Stichopathes sp* attach to nearby rocks.

Summary Description (habitat transitions noted)			
<p>HD VIDEO STARTS 0m/23:43:47 [1] view is temporarily obscured by sediment in the water column, camera angle and ROV height are sub-optimal, partially due to moving downslope. Substrate is mud, with sparse mixed seapens and burrowing anemones/cup corals. Fish are abundant, especially <i>Coryphaenoides rupestris</i> and many juvenile <i>Hoplostethus atlanticus</i>. 1m Camera angles down more, view still partial (due to slope). 5m Furrows suggestive of trawling activity in the area. 12m ROV descends and slows. 14m-23m sampling two pushcores. 37m ROV reaches bottom of slope, 38m moving upslope on other side, continued mud and sparse seapens. 53m landscape now sloping down, ROV traversing down/along slope diagonally right. 58m slope is increasingly steep, still mud, sea pens. 1h03m ROV starts moving diagonally uphill. 1h15m first boulder. 1h16m [2] Transition to boulders/cobbles on steep slope, colonised with mixed corals, especially serpulid worms, yellow lamellate sponges (OTU623), and uncoiled <i>Stichopathes sp</i> (OTU560). 1h18m Sloping bedrock. 1h19m Vertical bedrock cliffs, ROV ascends, then descends, and laterals along in front of the cliffs/slope. 1h22m-1h24m, 1h25m-1h28m stops for imagery. 1h28m [3] Traversing along terrace edge, mixed corals on the vertical rock, seapens and cup corals on the mud veneered clopping shelf. 1h37m [4] ROV moves down cliff/slope. Some areas with discrete <i>Solenosmilia variabilis</i> communities, however again the dominant species were serpulid worms, yellow lamellate sponges (OTU623), and uncoiled <i>Stichopathes sp</i> (OTU560). 1h57-1h59m stopped for imagery. 1h59m move backwards/right and downslope then stop for imagery until END OF HD VIDEO 2h00m/01:44:19.</p>			

Physical Data					
Reef (types can be concurrent)	35% reef	35% geogenic			
		n/a	n/a		
n/a					
Substrates	- bedrock - boulders - mud				
Geomorphology/Features	Canyon - steep slope				
Annex 1 Types	- boulder/cobble field - sloping bedrock - vertical bedrock				
Pressures	- 1 x furrows (trawl marks?) - 4 x plastic				

Biological Data				
Number of Species		79spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
566	Coryphaenoides rupestris	L	C	
651	Hoplostethus atlanticus	L	F	
623	Porifera lamellate sp 10 (YellowSolenoAssoc)	L	F	
606	Porifera lamellate sp 9	L	F	
560	Stichopathes sp	L	F	
106	Serpulidae sp 1	M	F	
585	Acanella arbicularia	L	O	
608	Acanthogorgia cf armata	L	O	
1047	Actinoscyphidae sp 1 (pink)	L	O	
1131	Apristurus sp (indet)	L	O	
20	Ascidiae sp 2	L	O	
574	cf Benthogone sp (white)	L	O	
1008	Chrysogorgiidae sp 1	L	O	
577	Coryphaenoides guentheri	L	O	
1072	Crinoidea sp (10 arm)	L	O	
649	Eknomisis sp	L	O	
973	Graeledone verrucosa	L	O	
622	Halipiteris cf finmarchica	L	O	
936	Harriotta raleighana	L	O	
917	Halonema sp 1	L	O	
56	Hydrozoa flatbranched	L	O	
1125	Hygrosoma sp	L	O	
274	Hymenodiscus coronata/ Brisinga endacaster	L	O	
654	Molva molva	L	O	
563	Neocyttus helgae	L	O	
1009	Notacanthidae sp 1 (Notacanthus cheminizi)	L	O	
1042	Parantipathes sp (unbranched)	L	O	
202	Phakellia ventillabrum	L	O	
700	Solenosmilia variabilis	L	O	
440	Synaphobranchus kaupii	L	O	
446	Trachychnus sp	L	O	
581	Umbellula sp	L	O	
1062	Acesta excavata	M	O	
605	Actiniaria sp 20	M	O	
1058	Caryophyllidae/Fabellidae (indet)	M	O	
2	Ceriantharia	M	O	
1117	UnknownSpring (small)?	M	O	
800	Porifera encrusting (blue)	Crust	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
132	Actinostolidae sp 1	L	R	
650	Asconema sp (Porif mass glob 14)	L	R	
572	Echinothuroidea sp (whiteDeep)	L	R	
307	Gorgonacea sp 7 (pink) cf Isidella	L	R	
1064	Isididae sp (fine branching)	L	R	
1070	Jasonisis sp (pinkSolenoAssoc)	L	R	
305	Leiopathes sp	L	R	
249	Lepidion eques	L	R	
1160	Lepidion quenneri	L	R	
1063	Neolithodes grimaldii	L	R	
1087	Novodinia sp	L	R	
1050	Paramuricea sp	L	R	
940	Pennatulacea sp (cf Kophobelemnidae)	L	R	
1083	Pennatulacea sp (thin)	L	R	
436	Pentametrocrinus atlanticus	L	R	
535	Porifera cup 2	L	R	
1080	Pseudoanthomastus sp	L	R	
547	Stauropathes arctica	L	R	
988	Zoroaster fulgens (robust)	L	R	
4	Actiniaria sp 1	M	R	
41	Actiniidae sp (sandBolocera)	M	R	
930	Actinopterygii sp 3	M	R	
146	Aphroditidae sp 1	M	R	
591	Ascidiae sp (clear)	M	R	
1173	Asteroidea (cf Cerasterias/Hymenaster, red/pink)	M	R	
584	Caryophyllia sp 5 (bullseye)	M	R	
1129	cf Echinus (deepPinkSpine)	M	R	
984	cf Halcampoiidae sp	M	R	
3	Edwardsiididae sp	M	R	
1056	Flabellum sp	M	R	
1076	Ophiuroidea (indet)	M	R	
918	Opisthotethis extensa	M	R	
555	Phormosoma placentia	M	R	
361	Styelaster sp 1	M	R	
261	Syringammina fragilissima	M	R	
199	Velatida sp 1	M	R	
311	Anthothelia grandiflora	Mass	R	
586	Zoanthidea sp 2	Mass	R	
34	Brachiopoda	S	R	
1026	Mysida (indet)	S	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(sparse, var) M.AtMB.Mu.SpnMeg	(sparse, lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(sparse, var) M.AtMB.Mu.SpnMeg 1058 Caryophyllidae/Flabellidae (indet), 2 Ceriantharia sp	
2	M.AtLB.Ro.MixCor 106 Serpulidae sp, 623 Porifera lamellate sp (yellow), 560 Stichopathes	
3	M.AtLB.Ro.MixCor, (sparse, var) M.AtMB.Mu.SpnMeg 106 Serpulidae sp, 560 Stichopathes, 1058 Caryophyllidae/Flabellidae (indet)	
4	M.AtLB.Ro.MixCor 106 Serpulidae sp, 623 Porifera lamellate sp (yellow), 560 Stichopathes	

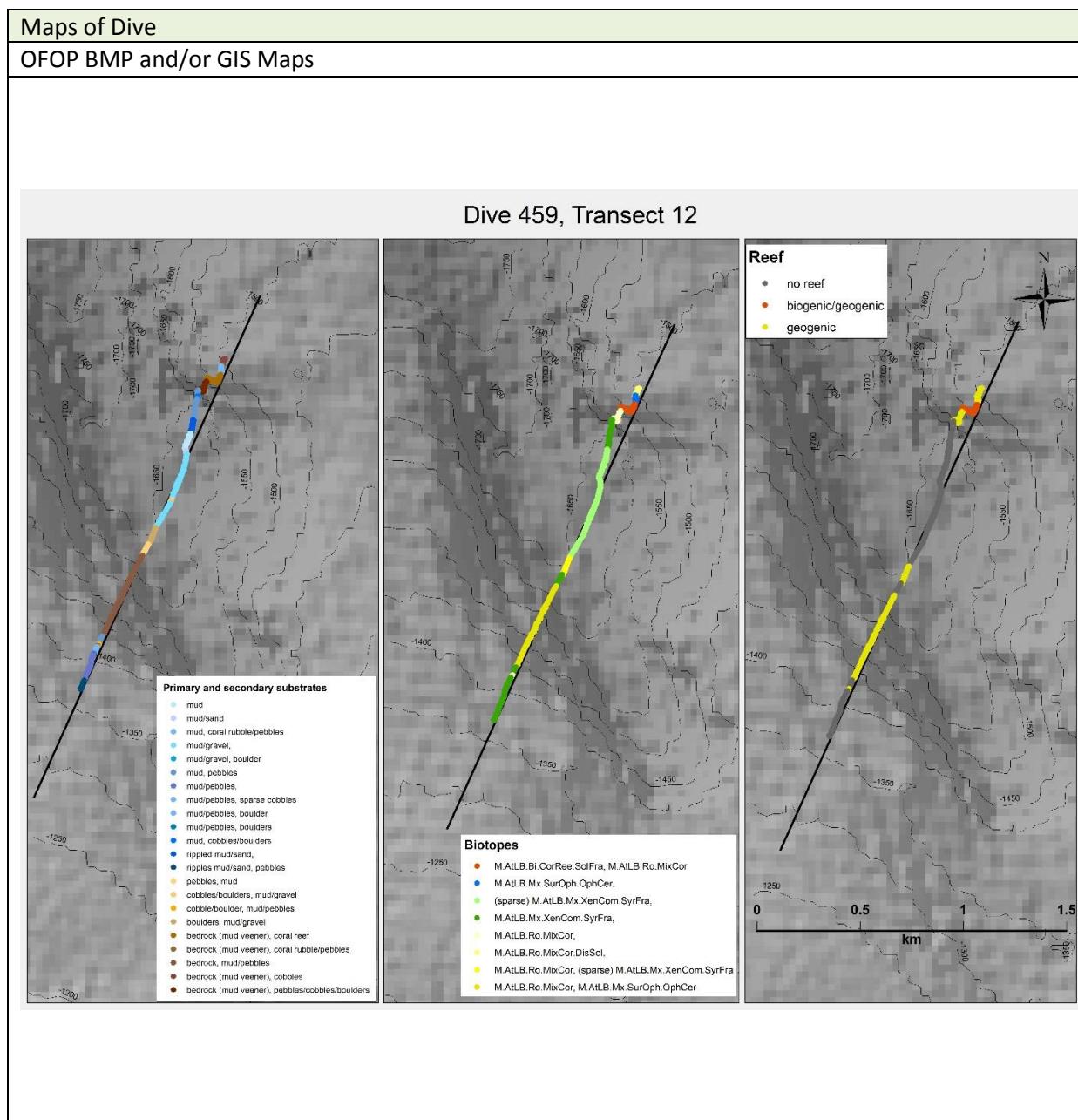
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens (ICES/OSPAR); - Hard-bottom coral garden: o Hard-bottom gorgonian and black coral gardens (ICES subcategory)	ICES/OSPAR ICES subcategory ICES subcategory	
Sea-pen and burrowing megafauna communities Seapen fields	OSPAR ICES	
Listed Species Encountered (Fish, Count)		
<i>Hoplostethus atlanticus</i>	39	IUCN/ OSPAR

Additional Comments		
- Escarpment feature at end of dive, otherwise non-geogenic (percentage of reef is overestimate due to being based on time) – see map.		

DIVE SUMMARY	
DIVE #	TRANSECT #
459	12

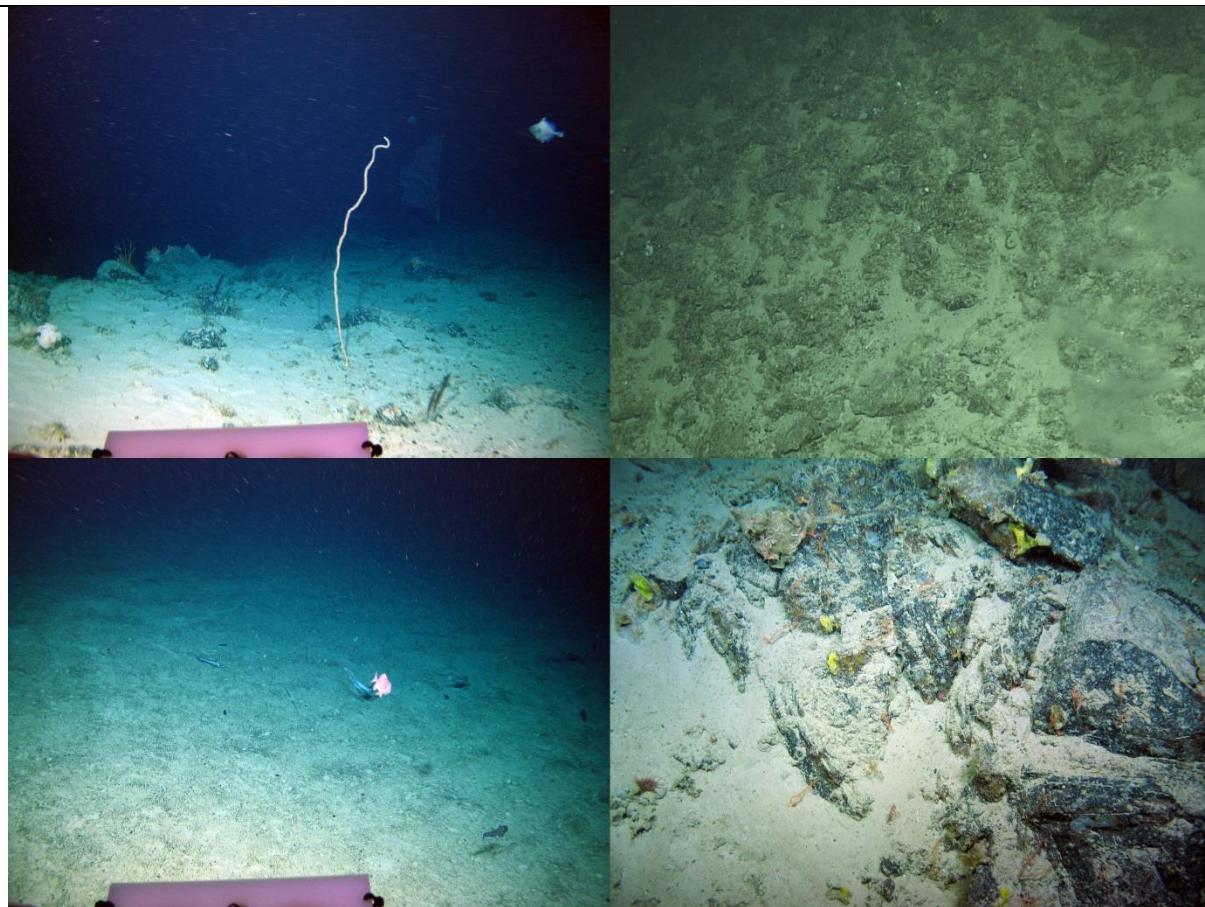
	Start	End
Date & Time	07/07/2017 19:42:30	07/07/2017 20:10:19
Latitude/ Longitude	54.13444017, -12.24986133	54.12024817, -12.2615885
Depth	1487.3	1367.42
Images	IMG_3917-IMG_4147.jpg	
Samples	2 x pushcores	

Location	C9
Target Features	Canyon, Escarpment
Depth Range	1366.77m-1647.07m (av. 1528.154m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The initial downslope portion of the transect saw the ROV proceed forward over multiple ledge features where large erect corals (such as these unbranching *Lepidisis* sp, seafan *Keratoisis* sp, and short brown unbranched *Parantipathes* sp.) were encountered periodically. Much of this slope was only partially visible or obscured due to the need to proceed forwards during descent. (M.AtLB.Ro.MixCor)

Top R. One section of the steep slope on the initial escarpment was dominated by dead reef. White globose sponges were associated with the dead *Solenosmilia variabilis* rubble, while *Stichopathes* sp (OTU560) adhered to intermittent bedrock features. (M.AtLB.Bi.CorRee.SolFra, M.AtLB.Ro.MixCor)

Bottom L. Much of this transect was spent over soft/mixed substrate with either gravel/pebble components. Xenophyophores (*Syringammina fragilissima*) dominate the majority of these areas, and fish (especially *Coryphaenoides rupestris*) were abundant. Here a juvenile *Hoplostethus atlanticus* (orange roughy) can also be seen – one of seven encountered on this dive. (M.AtLB.Mx.XenCom.SyrFra)

Bottom R. The second escarpment feature was viewed head on as the ROV ascended, allowing a clear view of the mixed corals and sponges associated. *Stichopathes* sp (OTU560) was again dominant, along with lamellate yellow sponges (OTU623). (M.AtLB.Ro.MixCor)

Summary Description (habitat transitions noted)

HD VIDEO A 0m/17:47:31 [1] The transect starts with the ROV moving downhill with partial/poor views of the seafloor which hosts mixed corals, including some large gorgonians, and multiple small discrete *Solenosmilia variabilis* colonies, on mud veneered bedrock and cobbles. 4m ROV turns to view slope, mud veneered bedrock, with coral rubble/pebbles 5m turn back away from slope and proceed downhill. **6m [2]** Thicker mud, pebbles and some coral rubble, *Ophiomuseum lymani* are abundant, with xenophyophores also present. **10m [3]** another shelf edge, lined with corals (gorgonians and *Solenosmilia variabilis*), the ROV proceeds over ledge and descends before reaching the base of the steep slope and turning to face the slope 12m. Steep mud veneered bedrock hosts mixed corals such as *Stichopathes sp* (OTU560), dense coral rubble is also found here with globose sponges associated. 23m Turn away from slope again to descend. **25m [4]** shelf edge proceed over, 26m another shelf edge, 29m turn to face slope. Mud veneered bedrock and cobbles/boulders with mixed corals, especially *Stichopathes sp* (OTU560), and *Ophiomuseum lymani*. 31-33m stop for imagery of octopus. 33m back away from cliff/slope and turn away to descend again. **34m [5]** bottom of steep slope, slope continues decreasing, mud with gravel and xenophyophores (*Syringammina fragilissima*). 37m small area of boulders/cobbles, mud veneered before continued mud/pebbles, xenophyophores. 45m mud/sand becomes rippled. 47m *Zoroaster fulgens* (robust morph) frequent amongst the xenophyophores. 52m Xenophyophores only dominant fauna, no longer rippled sediment. 1h06m small cobble/boulder area with corals, not enough for biotope change. **1h11m [6]** large boulders with mixed corals, discrete *Solenosmilia variabilis* on the first, but *Stichopathes sp* dominant over larger area. Landscape starts sloping upwards. **1h14m [7]** upsloping mud/pebbles with xenophyophores. **1h17m [8]** sloping/vertical bedrock with mud/pebble veneer in places. *Stichopathes* again dominant, along with yellow lamellate sponges (OTU623), *Ophiomuseum lymani* abundant where sediment veneered, *Stichopathes sp* still present in these areas too. 1h51m-1h52m stopped for imagery of *Paragorgia sp*. **1h54m [9]** slope decreasing, mud/pebbles xenophyophores. **1h 57m [10]** small area of cobbles/boulders then bedrock shelf with mixed corals, again *Stichopathes sp* dominates. 1h58m Mud/pebbles and xenophyophores. **HD VIDEO A ENDS 2h00m/19:47:34.** **HD VIDEO B STARTS 0m/19:49:15.** Continued xenophyophores, with sediment becoming rippled at 9m. 11m stop for pushcores until **HD VIDEO B ENDS 21m/20:10:19.**

Physical Data			
Reef (types can be concurrent)	55% Reef	55% geogenic	
		10% biogenic	0% living
Substrates	- bedrock - boulders - cobbles - coral reef - mud - mud/gravel - mud/pebbles - mud/sand - pebbles		100% dead
Geomorphology/Features	Canyon Escarpmant		
Annex 1 Types	- cobble/boulder field - vertical bedrock - sloping bedrock		
Pressures	n/a		

Biological Data			
Number of Species		74spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U.	Name	Size/Growth	SACFOR
566	Coryphaenoides rupestris	L	C
560	Stichopathes sp	L	C
551	Ophiomuseum lymani	L	F
623	Porifera lamellate sp 10 (YellowSolenoAssoc)	L	F
606	Porifera lamellate sp 9	L	F
700	Solenosmilia variabilis	L	F
988	Zoroaster fulgens (robust)	L	F
261	Syringammina fragilissima	M	F
585	Acanella arbuscula	L	O
132	Actinostolidae sp 1	L	O
1111	Cataetyx laticeps	L	O
653	Chimera opalescens	L	O
432	Holothuroidea (cf Laetmogone) (purple)	L	O
651	Hoplostethus atlanticus	L	O
1039	Hydrolagus cf affinis	L	O
274	Hymenodiscus coronata/ Brisinga endacanemos	L	O
1064	Isididae sp (fine branching)	L	O
1070	Jasonisis sp (pinkSolenoAssoc)	L	O
578	Keratoisis sp 2	L	O
305	Leiopathes sp	L	O
1160	Lepidion guentheri	L	O
563	Neocytus helgae	L	O
1009	Notacanthidae sp 1 (Notacanthus cheminizii)	L	O
1087	Novodinia sp	L	O
940	Pennatulacea sp (cf Kophobelemnidae)	L	O
436	Pentametrocrinus atlanticus	L	O
1159	Rajiformes (indet)	L	O
547	Stauropathes arctica	L	O
440	Synaphobranchus kaupii	L	O
291	Zoarcidae sp 2	L	O
1076	Ophiuroides (indet)	M	O
1051	Porifera massive globose sp 15 (solenoRubbleAssoc)	M	O
800	Porifera encrusting (blue)	Crust	R
1	Porifera encrusting sp 1 (white)	Crust	R
30	Porifera encrusting sp 10 (yellow)	Crust	R
554	Actinermus sp	L	R
1120	Anthoptilum sp (darkAxis)	L	R
1131	Apristurus sp (indet)	L	R
20	Ascidiae sp 2	L	R
284	Bathypathes sp (brown)	L	R
1105	Coryphaenoides armatus	L	R
577	Coryphaenoides guentheri	L	R
622	Halipterus cf finmarchica	L	R
557	Lepidisis sp	L	R
654	Molva molva	L	R
1194	Musoctopus johnsonianus	L	R
1065	Paragorgia sp (pale)	L	R
1050	Paramuricea sp	L	R
1042	Parantipathes sp (unbranched)	L	R
1146	Poecilosclerida sp	L	R
623	Porifera lamellate sp 10 (YellowSolenoAssoc)	L	R
1010	Porifera lamellate sp 12 (solen Assoc)	L	R
573	Solaster endeca	L	R
569	Squaliformes sp	L	R
446	Trachychynus sp	L	R
4	Actiniaria sp 1	M	R
605	Actiniaria sp 20	M	R
930	Actinopterygii sp 3	M	R
146	Aphroditidae sp 1	M	R
471	Asteronyx loveni	M	R
1058	Caryophyllidae/Fabellidae (indet)	M	R
388	Ceramaster/Peltaster/Plinthaster sp 2	M	R
2	Ceriantharia	M	R
1054	Chiostyliidae (indet)	M	R
131	Crinoidea sp 1	M	R
1056	Flabellum sp	M	R
1052	Gracilechinus cf alexandri	M	R
1166	Guttigadus latifrons	M	R
628	Holothuroidea sp 4 (cf Amperima)	M	R
1078	Ipnopidae sp	M	R
205	Paguridae spp	M	R
1114	Pennatulacea (indet)	M	R
311	Anthothelia grandiflora	Mass	R
1026	Mysida (indet)	S	R

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Bi.CorRee.SolFra	Mixed coral assemblage on Atlantic lower bathyal Solenosmilia reef framework (biogenic structure)	(Solenosmilia variabilis variant of) Lophelia pertusa reefs (OSPAR); Cold-water coral reef (ICES), Solenosmilia variabilis reef (ICES subcategory)
M.AtLB.Mx.SurOph.OphCer	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
M.AtLB.Mx.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mixed sediment	Mud and sand emergent fauna (ICES)
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Ro.MixCor.DisSol	Discrete Solenosmilia variabilis colonies on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Ro.MixCor.DisSol 700 Solenosmilia variabilis	
2	M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani, 261 Syringammina fragilissima	
3	M.AtLB.Bi.CorRee.SolFra, M.AtLB.Ro.MixCor 1051 Porifera massive globose sp 15 (solenoAssoc), 560 Stichopathes sp	
4	M.AtLB.Ro.MixCor 560 Stichopathes sp, 551 Ophiomuseum lymani	
5	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima, 988 Zoroaster fulgens (robust), 628 Holothuroidea sp (cf Amperima)	
6	M.AtLB.Ro.MixCor, (sparse) M.AtLB.Mx.XenCom.SyrFra 560 Stichopathes sp, 261 Syringammina fragilissima	
7	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima	
8	M.AtLB.Ro.MixCor, M.AtLB.Mx.SurOph.OphCer 560 Stichopathes sp, 623 Porifera lamellate sp 10 (yellowSolenoAssoc), 551 Ophiomuseum lymani	
9	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima	
10	M.AtLB.Ro.MixCor 560 Stichopathes sp	
11	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima, 585 Acanella arbuscula	

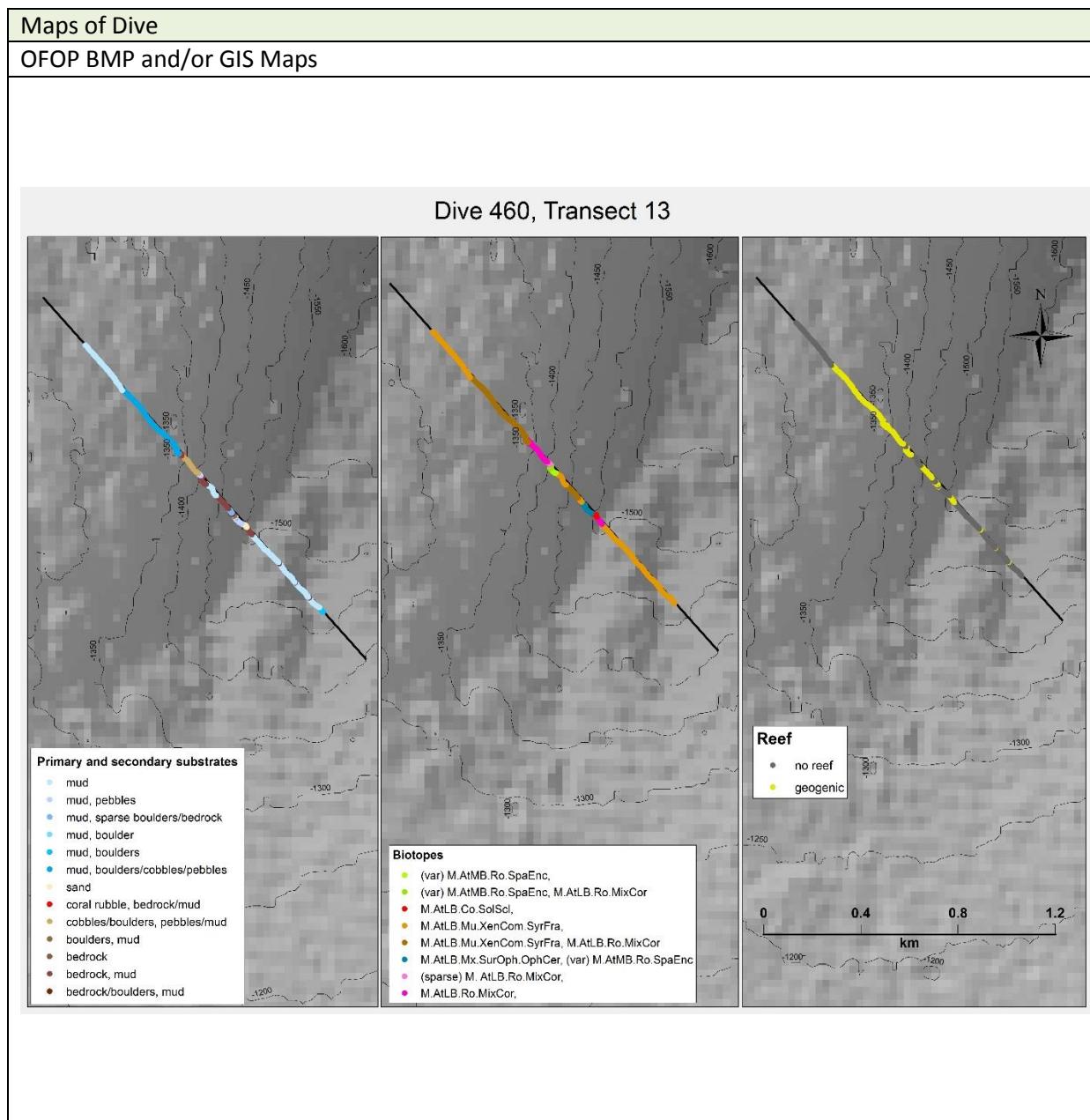
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
(Solenosmilia variabilis variant of) Lophelia pertusa reefs	OSPAR	
Cold-water coral reef	ICES	
- Solenosmilia variabilis reef	ICES subcategory	
Mud and sand emergent fauna	ICES	
Coral gardens	ICES/OSPAR	
- Hard-bottom coral garden	ICES subcategory	
o Hard-bottom gorgonian and black coral gardens	ICES subcategory	
o Colonial scleractinians on rocky outcrops	ICES subcategory	
Listed Species Encountered (Fish, Count)		
Hoplostethus atlanticus	7	IUCN/ OSPAR

Additional Comments		
<ul style="list-style-type: none"> - Valley with corals on the down and upslope, xenophyophores between. Small dead Solenosmilia reef at base of cliff (natural from fall off). 		

DIVE SUMMARY	
DIVE #	TRANSECT #
460	13

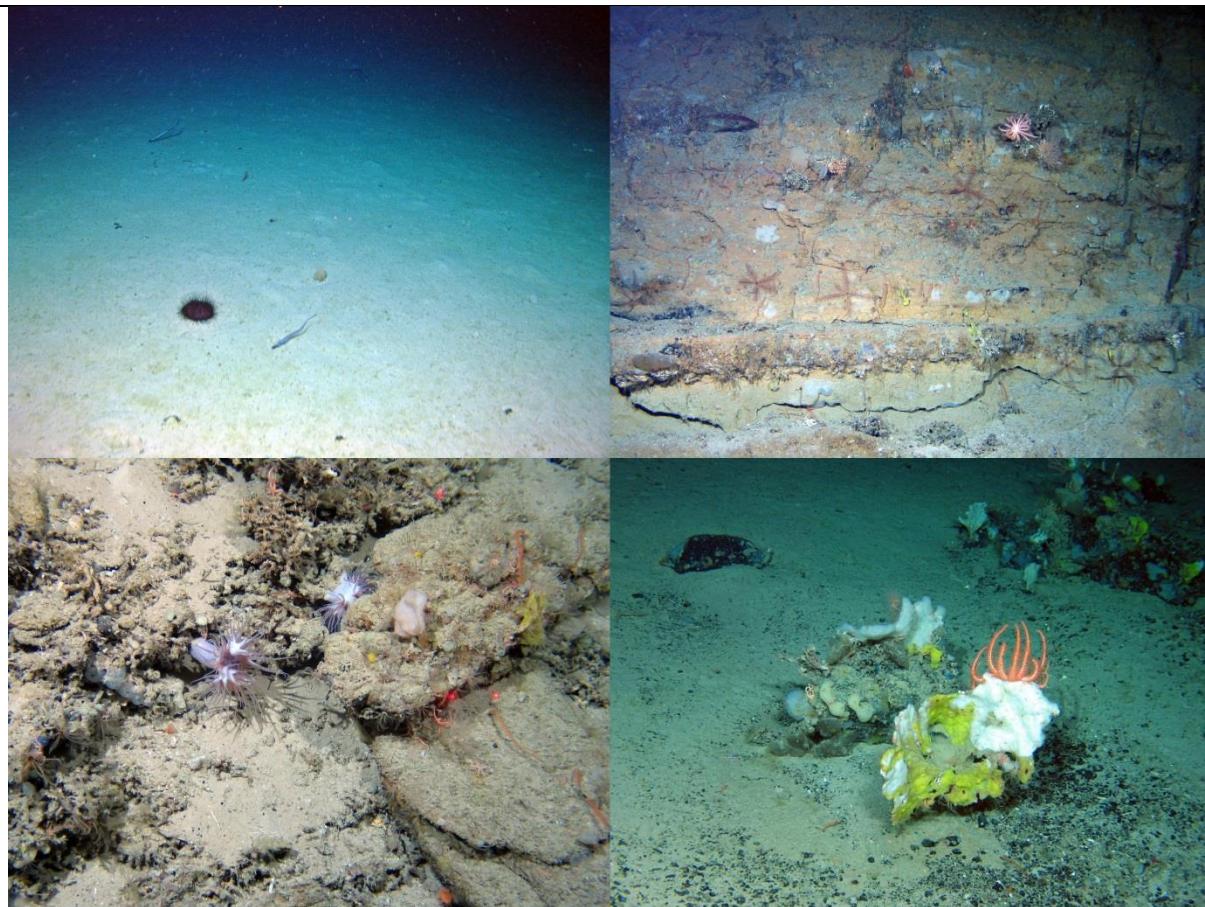
	Start	End
Date & Time	08/07/2017 00:21:32	08/07/2017 02:21:58
Latitude/ Longitude	54.17004483, -11.94242433	54.18046017, -11.956916
Depth	1441.9	1305.98
Images	IMG_4150-IMG_4237.JPG	
Samples	n/a	

Location	C8
Target Features	Canyon, Escarpment
Depth Range	1304.62-1519.33m (av. 1404.546m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Xenophyophores (*Syringammina fragilissima*) dominated all soft substrate areas.
(M.AtLB.Mu.XenCom.SyrFra)

Top R. One of the vertical bedrock cliffs. *Stichopathes* sp (OTU560) black corals are abundant, along with yellow lamellate sponges (OTU623). *Solenosmilia variabilis* colonies were found on overhanging rock, and other mixed corals sparsely encountered. Visible in this image are an unbranched *Parantipathes* sp black coral, brisingid seastars, and large five-armed *Pentametrocrinus* sp crinoids.
(M.AtLB.Ro.MixCor)

Bottom L. Areas of *Solenosmilia variabilis* rubble are found beneath overhangs with living colonies. Areas of bedrock were colonised by *Stichopathes* sp (OTU560), small crinoids and ophiuroids are abundant in the coral rubble. Two *Actinernus* sp anemones can be seen in the centre of this image.

Bottom R. Towards the end of the transect, sloping mud with xenophyophores also hosted well colonised boulders with mixed corals and sponges. (M.AtLB.Mu.XenCom.SyrFra, AtLB.Ro.MixCor)

Summary Description (habitat transitions noted)			
<p>HD VIDEO STARTS 0m/00:21:32 [1] Mud with scattered boulders, xenophyophores dominate, boulders are sparsely encrusted but too infrequent to be classed as a biotope mosaic. NB the first minute is unclear, with searching focus and obscured views. 5m small mud-veneered ledge feature, the ROV proceeds over the edge and descends with bottom visible, continued xenophyophores. 7m landscape starts sloping upwards. 12m another mud veneered rock ledge feature which the ROV ascends, then proceeds up steep mud slope. 18m mud veneered ledge, ROV ascends. 21-22m sparse boulders with corals (not enough to warrant biotope change). 27m boulder and cobbles proceed 28m [2] ledge feature, the ROV proceeds over and descends. Brief glimpse of mixed corals colonising cliff terraces before seabed view obscured during descent. 30m [3] ROV meets the base of cliff, sand with sparse cup corals. 31m [4] transition to mud, and mud veneered pebbles, upslope.</p> <p><i>Ophiomuseum lymani</i> dominant. Various small vertical bedrock ledge features are sparsely encrusted, especially with white encrusting sponges among other fauna. 38m [5] extended area of sloping mud with xenophyophores. 40m [6] several bedrock ledges, xenophyophores on mud veneered terraces, while sparse mixed corals (especially <i>Stichopathes</i> sp OTU560) colonise vertical rock. 45m [7] extended xenophyophores on mud. 50m [8] sparse encrusted sloping bedrock/cliffs. 53m [9] Top of cliff, ROV traverses right. Sparse encrusted cliffs, with sparse mixed corals on cobbles/boulders on cliff ledge. 56m-57m stop for imagery then proceed over top of cliff meeting next sparse encrusted mud veneered cliff. 59m [10] reach top of cliff, pebbles host sparse mixed corals, especially <i>Stichopathes</i> sp, 1h01m, transition to broken bedrock cobbles/boulders and denser mixed corals/sponges with yellow lamellate sponges dominating (OTU623). 1h02m-1h03m stop for imagery. 1h11m <i>Solenosmilia variabilis</i> coral rubble mixed in on slope of broken bedrock boulders before reaching the base of cliff which ROV ascends. 1h12m traverse right. 1h15m continue ascending. 1h16m Coral rubble steep slope until 1h20m vertical rock cliff. 1h20m reach top of cliff, where some <i>Solenosmilia variabilis</i> colonises the overhanging rock (likely partly responsible for the rubble below, assume there is more along cliff edge laterally from here). 1h23m [11] Boulders and cobbles continue the mixed coral community, while xenophyophores dominate intermediate mud slope areas. ROV traverses diagonally right. 1h29m ROV moving forwards. 1h47m [12] mud and xenophyophores. 2h00m ROV starts revering and lateralling left until END OF HD VIDEO</p> <p>2h00m/02:21:58.</p>			

Physical Data			
Reef (types can be concurrent)	58% reef	58% geogenic	
		n/a	n/a
Substrates	- bedrock - boulders - cobbles - coral rubble - mud - pebbles - sand		
Geomorphology/Features	Canyon Escarpment		
Annex 1 Types	- broken bedrock - cobble/boulder fields - sloping bedrock - vertical bedrock		
Pressures	- 1x black plastic		

Biological Data			
Number of Species		101spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U	Name	Size/Growth	SACFOR
585	Acanella arbuscula	L	C
606	Porifera lamellate sp 9	L	C
131	Crinoidea sp 1	M	C
261	Syringammina fragilissima	M	C
623	Porifera lamellate sp 10 (YellowSolenoAssoc)	L	F
560	Stichopathes sp	L	F
554	Actinemus sp	L	O
1031	Anachalyptiscrinus nerfertiti	L	O
264	Aphrocallistes sp	L	O
20	Ascidiae sp 2	L	O
650	Asconema sp (Porif mass glob 14)	L	O
1086	cf Thouarella sp	L	O
1008	Chrysogorgidae sp 1	L	O
566	Coryphaenoides rupestris	L	O
128	Cottunculus microps	L	O
1072	Crinoidea sp (10 arm)	L	O
307	Gorgonacea sp 7 (pink) cf Isidella	L	O
432	Holothuroidea (cf Laetmogone) (purple)	L	O
1125	Hygrosoma sp	L	O
274	Hymenodiscus coronata/ Brislinga endacnemos	L	O
1064	Isididae sp (fine branching)	L	O
578	Keratoisis sp 2	L	O
305	Leiopathes sp	L	O
1050	Paramuricea sp	L	O
1042	Paripathes sp (unbranched)	L	O
436	Pentametrocrinus atlanticus	L	O
263	Porania pulvilia (poss stormi)	L	O
700	Solenosmilia variabilis	L	O
569	Squaliformes sp	L	O
547	Stauropathes arctica	L	O
440	Synaphobranchus kaupii	L	O
446	Trachychynus sp	L	O
291	Zoarcidae sp 2	L	O
1058	Caryophyllidae/Fabellidae (indet)	M	O
800	Porifera encrusting (blue)	Crust	R
1	Porifera encrusting sp 1 (white)	Crust	R
30	Porifera encrusting sp 10 (yellow)	Crust	R
1047	Actinoscyphidae sp 1 (pink)	L	R
132	Actinostolidae sp 1	L	R
284	Bathypathes sp (brown)	L	R
1084	cf Pheronema sp (Rock poss Aphorme horrida)	L	R
1059	Colossendeis sp	L	R
577	Coryphaenoides guentheri	L	R
973	Graeledone verrucosa	L	R
651	Hoplostethus atlanticus	L	R
1039	Hydrolagus cf affinis (*poss H. pallidus)	L	R
1070	Jasonisis sp (pinkSolenoAssoc)	L	R
249	Lepidion eques	L	R
1160	Lepidion guentheri	L	R
557	Lepidisis sp	L	R
O.T.U	Name	Size/Growth	SACFOR
1055	Liponema sp	L	R
654	Molva molva	L	R
563	Neocytus helgae	L	R
1009	Notacanthidae sp 1 (Notacanthus cheminizi)	L	R
551	Ophiomuseum lymani	L	R
1065	Paragorgia sp (twiggy)	L	R
1046	Pennatula aculeata	L	R
1083	Pennatulacea sp (thin)	L	R
255	Phelliactis sp 1	L	R
1192	Plexauridae sp	L	R
552	Polyacanthonotus rissoanus	L	R
535	Porifera cup 2	L	R
1156	Porifera lamellate (bubbles)	L	R
1080	Pseudanthomastus sp	L	R
1044	Radicipes cf gracilis	L	R
573	Solaster endeca	L	R
988	Zoroaster fulgens (robust)	L	R
1062	Acesta excavata	M	R
4	Actinaria sp 1	M	R
605	Actinaria sp 20	M	R
1066	Adamsia sp (Paguridae Associated)	M	R
278	Anthomastus grandiflorus	M	R
146	Aphroditidae sp 1	M	R
471	Asteronyx loveni	M	R
267	Bonella viridis	M	R
6	Caryophyllia sp	M	R
584	Caryophyllia sp 5 (bulleseye)	M	R
2	Ceriantharia	M	R
1129	cf Echinus (deepPinkSpine)	M	R
984	cf Halcampoididae sp	M	R
1054	Chirostylidae (indet)	M	R
113	Colus sp	M	R
39	Corallimorphidae sp 1 (dark)	M	R
131	Crinoidea sp 1 (red)	M	R
1056	Flabellum sp	M	R
1002	Goniasteridae sp	M	R
1166	Guttiagadus latifrons	M	R
1154	Henricia sp (deep)	M	R
628	Holothuroidea sp 4 (cf Amperima)	M	R
1078	Ipnopidae sp	M	R
1126	Munnidopsis sp	M	R
1076	Ophiuroidea (indet)	M	R
205	Paguridae spp	M	R
555	Phormosoma placenta	M	R
1115	Pterasteridae sp	M	R
204	Reteperaturella sp 1	M	R
106	Serpulidae sp 1	M	R
1117	UnknownSpring (small)?	M	R
311	Anthothelia grandiflora	Mass	R
586	Zoanthidea sp 2	Mass	R
1026	Mysida (indet)	S	R

Biotope List (Marine Habitat Classification for Britain & Ireland)			
Code	Name	Listed	
M.AtLB.Mu.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mud	Mud and sand emergent fauna (ICES)	
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)	
M.AtLB.Co.SolScl	Solitary scleractinian field on Atlantic lower bathyal coarse sediment	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Cup-coral fields (ICES subcategory)	
M.AtLB.Mx.SurOph.OphCer	Ophiomuseum lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment		

(var) M.AtMB.Ro.SpaEnc	(lower bathyal variant) Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima	
2	M.AtLB.Ro.MixCor 1042 Parantipathes sp (unbranched)	
3	M.AtLB.Co.SolScl 1058 Caryophyllidae/Fabellidae (indet)	
4	M.AtLB.Mx.SurOph.OphCer, (var) M.AtMB.Ro.SpaEnc 551 Ophiomuseum lymani, 1 Porifera encrusting sp 1 (white)	
5	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima	
6	M.AtLB.Mu.XenCom.SyrFra, M.AtLB.Ro.MixCor 261 Syringammina fragilissima, 560 Stichopathes sp	
7	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima	
8	(var) M.AtMB.Ro.SpaEnc 1 Porifera encrusting sp 1 (white), 560 Stichopathes sp	
9	(var) M.AtMB.Ro.SpaEnc, M.AtLB.Ro.MixCor 1 Porifera encrusting sp 1 (white), 560 Stichopathes sp	
10	M.AtLB.Ro.MixCor 623 Poriferal lamellate sp 10 (yellow), 1 Porifera encrusting sp 1 (white), 560 Stichopathes sp	
11	M.AtLB.Mu.XenCom.SyrFra, AtLB.Ro.MixCor 261 Syringammina fragilissima, 1053 Porifera lamellate sp 13 (white), 623 Porifera lamellate sp 10 (yellow)	
12	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima	

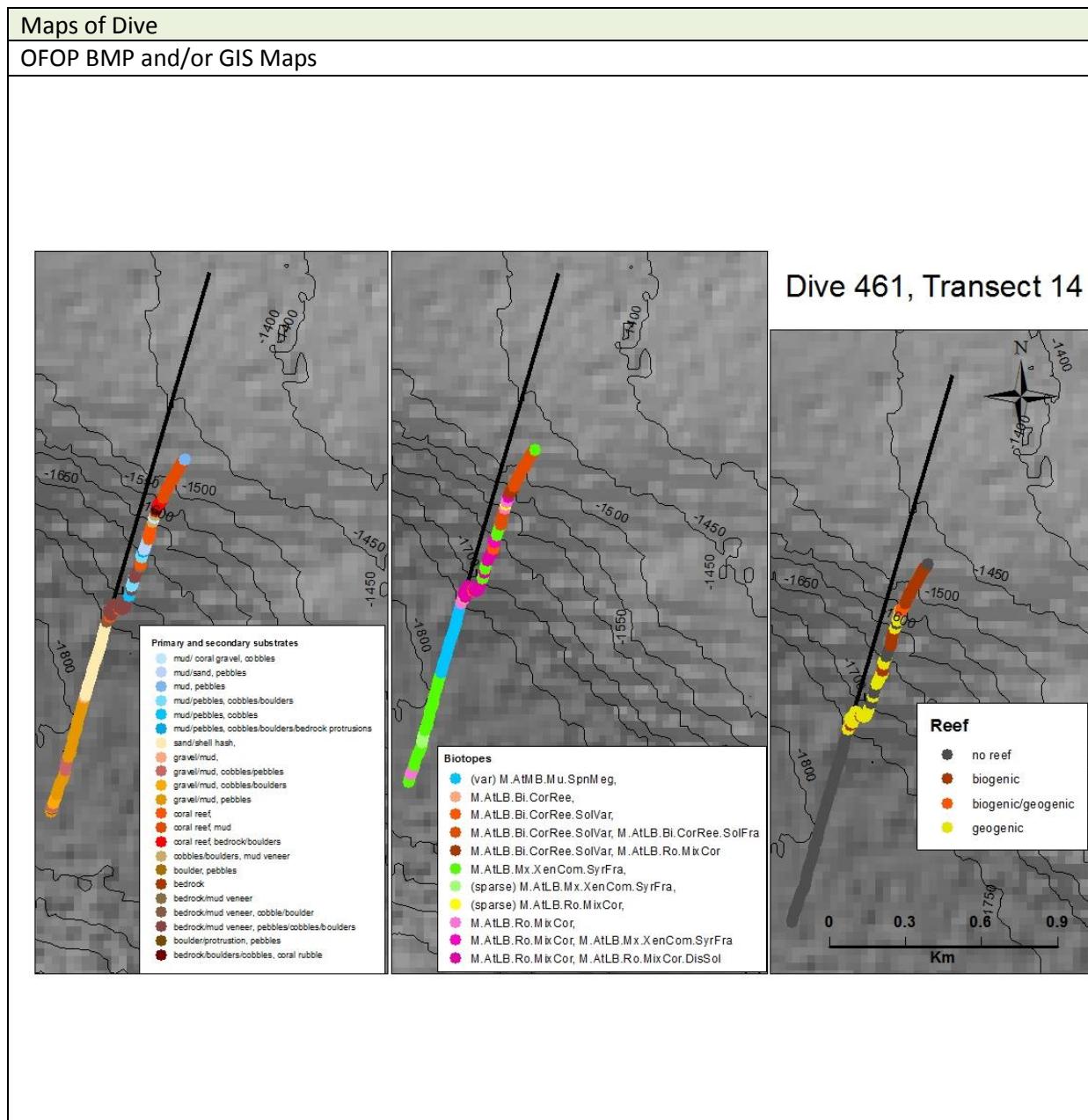
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens - Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens - Soft-bottom coral garden: Cup-coral fields	ICES/OSPAR ICES subcategory ICES subcategory	ICES
Listed Species Encountered (Fish, Count)		
Hoplostethus atlanticus	9	IUCN/ OSPAR

Additional Comments		
- Cliffs with Solenosmilia and mixed corals, and xenophyophores fields on soft sediment.		

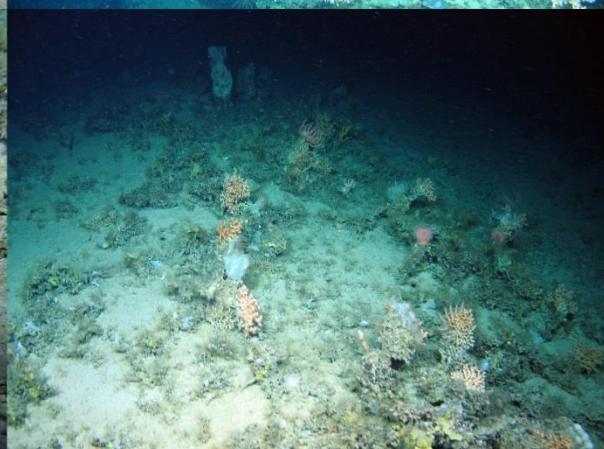
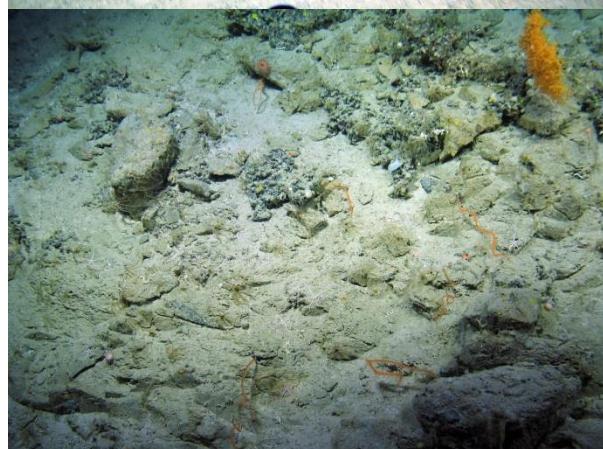
DIVE SUMMARY	
DIVE #	TRANSECT #
461	14

	Start	End
Date & Time	08/07/2017 05:25:44	08/07/2017 07:51:52
Latitude/ Longitude	54.21275667, -11.89344117	54.22526283, -11.8842355
Depth	1770.38	1461.76
Images	IMG_4243-IMG_4602.JPG	
Samples	n/a	

Location	C8
Target Features	Canyon, Escarpment
Depth Range	1460.43-1782.86m (av. 1644.356m)



Representative Images (Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Early on in the composite video (only) and the start of the HD video, there are vast xenophyophore fields (*Syringammina fragilissima*) on mixed gravel/mud sediment. The same assemblage occurs a couple more times throughout the dive. (M.AtLB.Mx.XenCom.SyrFra)

Top R. A ledge feature (geogenic reef) with discrete *Solenosmilia variabilis* colonies and mixed corals (here a large *Keratoisis* sp. sea fan is encountered). (M.AtLB.Ro.MixCor.DisSol)

Bottom L. Uncoiled *Stichopathes* sp (OTU560) can be seen here with a *Stauropathes arctica* fan on cobbles/boulders/sloping rock with mud veneer. Similar mixed coral assemblages with the *Stichopathes* remaining dominant are encountered frequently throughout the dive. (M.AtLB.Ro.MixCor)

Bottom R. Several reef areas, and one (at the end of the transect) particularly large and healthy-looking *Solenosmilia varailabilis* reef are found in this area. There are many associated corals and sponges found on the reef. (M.AtLB.Bi.CorRee.SolVar, M.AtLB.Mx.XenCom.SyrFra)

Summary Description (habitat transitions noted)

COMPOSITE VIDEO TRANSECT STARTS AT 05:25am [1] Xenophyophores (*Syringammina fragilissima*) on mixed gravel/mud sediment. 05:26am Carbonate protrusion with lamellate sponge (not large enough area to be biotope). **05:27am** [2] Area of mixed corals dominated by *Chrysogorgiidae sp.* with mixed sediment including cobbles and boulders. **05:29am** [3] pebbles/gravel and xenophyophores, sometimes sparse. 05:35am Small area with lamellate sponges on cobbles. (not large enough for biotope change) **HD VIDEO STARTS AT 0m/05:46am** continued xenophyophores on gravel and pebbles. Pebbles become sparser. **2m** [4] sand sometimes with shell hash/gravel component, with sparse sea pens (species hard to discern as they are small). 3m sand becomes rippled 7m sand waves, continued pens. 10m no more sand waves. **15m** [5] Vertical /sloping rock with light mud veneer and some cobbles boulders, uncoiled *Stichopathes sp* (OTU560) dominates, mixed corals/sponges. **17m** [6] *Solenosmilia* rubble on slope, 100% dead, although rubble associated globose sponges (OTU1051) are plentiful. **18m** [7] vertical rock and shelf with attached mixed corals and living *Solenosmilia* colonies. ROV traverses left along the crest of the ledge until reaching 20m cobble/boulder slope then continues uphill. Mosaic of mixed coral assemblages dominated by either *Stichopathes sp* (slope/boulders) or discrete *Solenosmilia variabilis* colonies (especially overhangs). 25m traverse right along a ledge, 30m stop for imagery (*Keratoisis sp*). **34m** [8] continue forward overledge up slope of *S. variabilis* reef, ~10% living with associated fauna up to 36m [9] another series of alternating ledges and cobble/boulder slopes with discrete *S. variabilis* colonies / *Stichipathes sp* dominated mixed corals. 42-43m stop for imagery (cf *Farreidae sp*) 44-46m stop for imagery (*Parantipathes sp*). **51m** [10] Xenophyophores on pebbles/mud, some cobbles. **54m** [11] Sparse mixed corals on (denser) pebbles/mud with cobbles and boulders. **55m** [12] again less dense with xenophyophores, **58m** [13] cobbles boulders/ buried ledges/vertical/sloping rock with mixed corals, *Stichopathes/Solenosmilia* dominated mosaic again. **1h04m** [14] more sloping *Solenosmilia* reef, again ~10% living with associated fauna. Some islands of *Stichopathes* on sloping rock. **1h06m** [15] mosaic of mixed coral *Stichopathes* dominated cobbles/boulder areas, and xenophyophore fields on pebbles/mud. 1h9m-1h11m stopped for imagery (*Keratoisis sp*). **1h11m** [16] mud/sand with scattered pebbles hosting xenophyophores, *Pennatula acculeata* and *Ophiomuseum lymani*. **1h14m** [17] richer *Solenosmilia* reef (10-25% living), mixed corals also associated, globose sponge co-dominates (OTU1051). **1h19m** [18] sometimes sparse *Stichopathes* dominated mixed corals on sloping rock with mud/gravel/pebble veneer, cobbles/boulders, vertical rock, and broken sloping rock/carbonate, with some white boulders encountered. **1h24m** [19] increasing coral rubble on boulder/broken rock slope, with discrete living *Solenosmilia* colonies. **1h27m** [20] continues mixed corals on rock mosaicked with *Solenosmilia* reef 25-50%. **1h40m** [21] Climb over ridge onto large rich *Solenosmilia* reef 25-50% living, with many framework associated corals and sponges continuing up a gentle slope until **2h04m** [22] mud/pebbles and xenophyophores. ROV stops, then **HD VIDEO ENDS AT 2h5m/07:51am**.

Physical Data			
Reef (types can be concurrent)	65 % reef	42 % geogenic	
		31 % biogenic	~25% living (i.e. looks healthy!)
			~75% dead
Substrates	<ul style="list-style-type: none"> - bedrock - boulders - cobbles - coral reef - gravel/mud - mud - mud/sand - pebbles - sand/shell hash 		
Geomorphology/Features	<p>Canyon</p> <ul style="list-style-type: none"> - Rock feature - Sand waves <p>Escarpment</p> <ul style="list-style-type: none"> - Ledge/hole - White rocks <p>Interfluve</p>		
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder fields - coral rubble/framework fields - dead coral structures - pebble/cobble field (? not named) - sloping rock - vertical rock 		
Pressures	<ul style="list-style-type: none"> - 1 x plastic (ice cream tub) 		

Biological Data							
Number of Species		90 spp					
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)							
O.T.U	Name	Size/Growth	SACFOR	O.T.U	Name	Size/Growth	SACFOR
700	<i>Solenosmilia variabilis</i>	L	C	569	<i>Squaliformes</i> sp	L	O
560	<i>Stichopathes</i> sp	L	C	547	<i>Stauropathes arctica</i>	L	O
132	<i>Actinostolidae</i> sp 1	L	F	440	<i>Synaphobranchus kaupii</i>	L	O
1042	<i>Parantipathes</i> sp (unbranched)	L	F	1114	<i>Pennatulacea</i> (indet)	M	O
131	<i>Crinoidea</i> sp 1	M	F	75	Porifera encrusting globose (pale)	Mass	O
1076	<i>Ophiuroidea</i> (indet)	M	F	800	Porifera encrusting (blue)	Crust	R
1051	Porifera massive globose sp 15 (solent)	M	F	1	Porifera encrusting sp 1 (white)	Crust	R
204	<i>Reteporella</i> sp 1	M	F	30	Porifera encrusting sp 10 (yellow)	Crust	R
261	<i>Syringammina fragilissima</i>	M	F	608	<i>Acanthogorgia cf armata</i>	L	R
554	<i>Actinernus</i> sp	L	O	592	<i>Antipatharia</i> sp 4 cf <i>Stauropathes</i>	L	R
1047	<i>Actinoscyphidae</i> sp 1 (pink)	L	O	1045	<i>Bathycriinidae</i> sp 2 cf <i>Porphyrocrinus</i> th	L	R
1031	<i>Anachalyptiscrinus nefertiti</i>	L	O	258	<i>Brosme brosme</i>	L	R
20	<i>Ascidiae</i> sp 2	L	O	1111	<i>Cataetyx laticeps</i>	L	R
1038	<i>Asconema</i> sp	L	O	1107	cf <i>Anthoptilum</i> sp	L	R
284	<i>Bathypathes</i> sp (brown)	L	O	56	<i>Hydrozoa</i> flat/branched	L	R
1142	cf <i>Farreidae</i> sp	L	O	1055	<i>Liponema</i> sp	L	R
1008	<i>Chrysogorgiidae</i> sp 1	L	O	1009	<i>Notacanthidae</i> sp 1 (<i>Notacanthus chem</i>	L	R
577	<i>Coryphaenoides quennerteri</i>	L	O	1083	<i>Pennatulacea</i> sp (thin)	L	R
566	<i>Coryphaenoides rupestris</i>	L	O	255	<i>Phelliactis</i> sp 1	L	R
1015	<i>Dendrobathypathes</i> sp	L	O	1192	<i>Plexauridae</i> sp	L	R
649	<i>Eknomisis</i> sp	L	O	263	<i>Porania pulvillus</i>	L	R
973	<i>Graneledone verrucosa</i>	L	O	1075	Porifera cylindrical sp	L	R
274	<i>Hymenodiscus coronata/ Brisinga enda</i>	L	O	4	Actiniaria sp 1	M	R
1064	<i>Isididae</i> sp (fine branching)	L	O	605	Actiniaria sp 20	M	R
1070	<i>Jasonisis</i> sp (pinkSolenoAssoc)	L	O	1066	<i>Adamsia</i> sp (Paupiridae Associated)	M	R
578	<i>Keratoisis</i> sp 2	L	O	278	<i>Anthomastus grandiflorus</i>	M	R
315	<i>Koehlermetra porrecta</i>	L	O	146	<i>Aphroditidae</i> sp 1	M	R
249	<i>Lepidion eques</i>	L	O	471	<i>Asteronyx loveni</i>	M	R
557	<i>Lepidisis</i> sp	L	O	6	<i>Caryophyllia</i> sp	M	R
563	<i>Neocytthus helgae</i>	L	O	2	<i>Ceriantharia</i>	M	R
1087	<i>Novodinia</i> sp	L	O	1049	cf <i>Psolus</i> sp	M	R
551	<i>Ophiomuseum lymani</i>	L	O	1054	<i>Chirostylidae</i> (indet)	M	R
1050	<i>Paramuricea</i> sp	L	O	113	<i>Colus</i> sp	M	R
1046	<i>Pennatula aculeata</i>	L	O	43	<i>Corallimorphidae</i> sp 2	M	R
436	<i>Pentametrocrinus atlanticus</i>	L	O	445	<i>Echinus</i> sp 1	M	R
552	<i>Polyacanthonotus rissoanus</i>	L	O	1056	<i>Flabellum</i> sp	M	R
1030	<i>Polymastia</i> cf <i>boletiformis</i>	L	O	1052	<i>Graciechinus</i> cf <i>alexandri</i>	M	R
263	<i>Porania pulvillus</i> (poss stormi)	L	O	1078	<i>Ipnopidae</i> sp	M	R
623	Porifera lamellate sp 10 (YellowSoleno/	L	O	205	<i>Paupiridae</i> spp	M	R
1010	Porifera lamellate sp 12 (solen Assoc)	L	O	1132	Porifera lamellate lobose (fleshy)	M	R
606	Porifera lamellate sp 9	L	O	1134	<i>Scyphozoa</i> sp (indet)	M	R
83	Porifera massive lobose sp 6 (cf Geodi)	L	O	106	<i>Serpulidae</i> sp 1	M	R
611	Rhabdodictyon cf <i>delicatum</i>	L	O	198	<i>Stichastrella rosea</i>	M	R
573	<i>Solaster endeca</i>	L	O	311	<i>Anthothelia grandiflora</i>	Mass	R
				82	<i>Cirripedia</i> sp	Mass	R
				1149	<i>Zoanthidea</i> sp (sweetcorn)	Mass	R

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtMB.Mu.SpnMeg	(lower bathyal, sand, variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
M.AtLB.Bi.CorRee	Atlantic lower bathyal cold water coral reef (biogenic structure)	(dead structure)
M.AtLB.Bi.CorRee.SolVar	Atlantic lower bathyal live <i>Solenosmilia variabilis</i> reef (biogenic structure)	(<i>Solenosmilia variabilis</i> variant of) <i>Lophelia pertusa</i> reefs (OSPAR); Cold-water coral reef (ICES), <i>Solenosmilia variabilis</i> reef (ICES subcategory);

M.AtLB.Mx.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mixed sediment	Mud and sand emergent fauna (ICES)
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Ro.MixCor.DisSol	Discrete Solenosmilia variabilis colonies on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
M.AtLB.Bi.CorRee.SolFra	Mixed coral assemblage on Atlantic lower bathyal Solenosmilia reef framework (biogenic structure)	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory) Colonial scleractinians on rocky outcrops (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima	
2	M.AtLB.Ro.MixCor 1008 Chrysogorgiidae sp 1	
3	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima	
4	(var) M.AtMB.Mu.SpnMeg 1114 Pennatulacea (indet)	
5	M.AtLB.Ro.MixCor 560 Stichopathes sp	
6	M.AtLB.Bi.CorRee 1051 Porifera massive globose sp 15 (solenoRubbleAssoc)	
7	M.AtLB.Ro.MixCor, M.AtLB.Ro.MixCor.DisSol 560 Stichopathes sp, 700 Solenosmilia variabilis	
8	M.AtLB.Bi.CorRee.SolVar 1051 Porifera massive globose sp 15 (solenoRubbleAssoc)	
9	M.AtLB.Ro.MixCor, M.AtLB.Ro.MixCor.DisSol 560 Stichopathes sp, 700 Solenosmilia variabilis	
10	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima	
11	M.AtLB.Ro.MixCor, M.AtLB.Ro.MixCor.DisSol 560 Stichopathes sp, 700 Solenosmilia variabilis	
12	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima	
13	M.AtLB.Ro.MixCor, M.AtLB.Ro.MixCor.DisSol 560 Stichopathes sp, 700 Solenosmilia variabilis	
14	M.AtLB.Bi.CorRee.SolVar	

	1051 Porifera massive globose sp 15 (solenoRubbleAssoc)
15	M.AtLB.Ro.MixCor, M.AtLB.Mx.XenCom.SyrFra 560 Stichopathes sp, 261 Syringammina fragilissima
16	M.AtLB.Mx.XenCom.SyrFra 261 Syringammina fragilissima, 1046 Pennatula acculeata, 551 Ophiomuseum lymani
17	M.AtLB.Bi.CorRee.SolVar, M.AtLB.Bi.CorRee.SolFra 1051 Porifera massive globose sp 15 (solenoRubbleAssoc), 700 Solenosmilia variabilis
18	M.AtLB.Ro.MixCor 560 Stichopathes sp
19	M.AtLB.Ro.MixCor, M.AtLB.Ro.MixCor.DisSol 560 Stichopathes sp, 700 Solenosmilia variabilis
20	M.AtLB.Bi.CorRee.SolVar, M.AtLB.Ro.MixCor 700 Solenosmilia variabilis, 560 Stichopathes sp
21	M.AtLB.Bi.CorRee.SolVar, M.AtLB.Bi.CorRee.SolFra 700 Solenosmilia variabilis, 1010 Porifera lamellate sp 12 (solen Assoc)
22	M.AtLB.Mx.XenCom.SyrFra 261 Syringamiina fragilissima

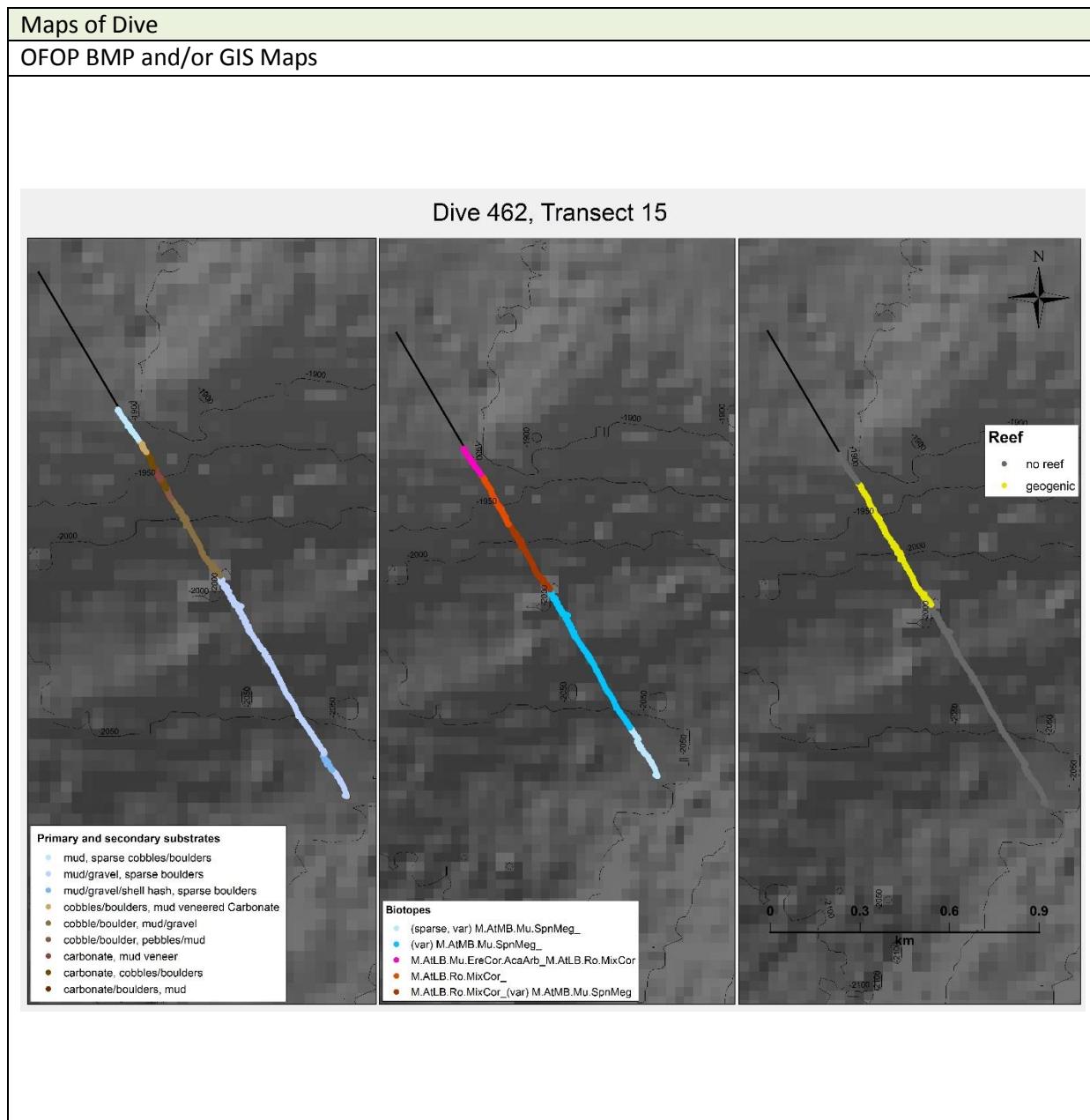
Conservation Targets	
Listed Habitats Encountered	
Name	Authority
Mud and sand emergent fauna	ICES
Sea-pen and burrowing megafauna communities	OSPAR
Seapen fields	ICES
(Solenosmilia variabilis variant of) Lophelia pertusa reefs	OSPAR
Cold-water coral reef	ICES
- Solenosmilia variabilis reef	ICES subcategory
Coral gardens (ICES/OSPAR);	ICES/OSPAR
- Hard-bottom coral garden:	ICES subcategory
o Hard-bottom gorgonian and black coral gardens	ICES subcategory
o Colonial scleractinians on rocky outcrops	ICES subcategory
Listed Species Encountered (Fish, Count)	
n/a	n/a

Additional Comments	
<ul style="list-style-type: none"> - There is some very healthy and species rich <i>Solenosmilia variabilis</i> reef, especially between HD video 1h40-2h04m. - The first 30mins of this dive has no accompanying HD video (failed start of recording). This dive evaluation therefore has a rough analysis derived from the pilot /digi stills composite cameras (poor quality) prior to the beginning of the HD video. (There are a couple of images taken during this period too). 	

DIVE SUMMARY	
DIVE #	TRANSECT #
462	15

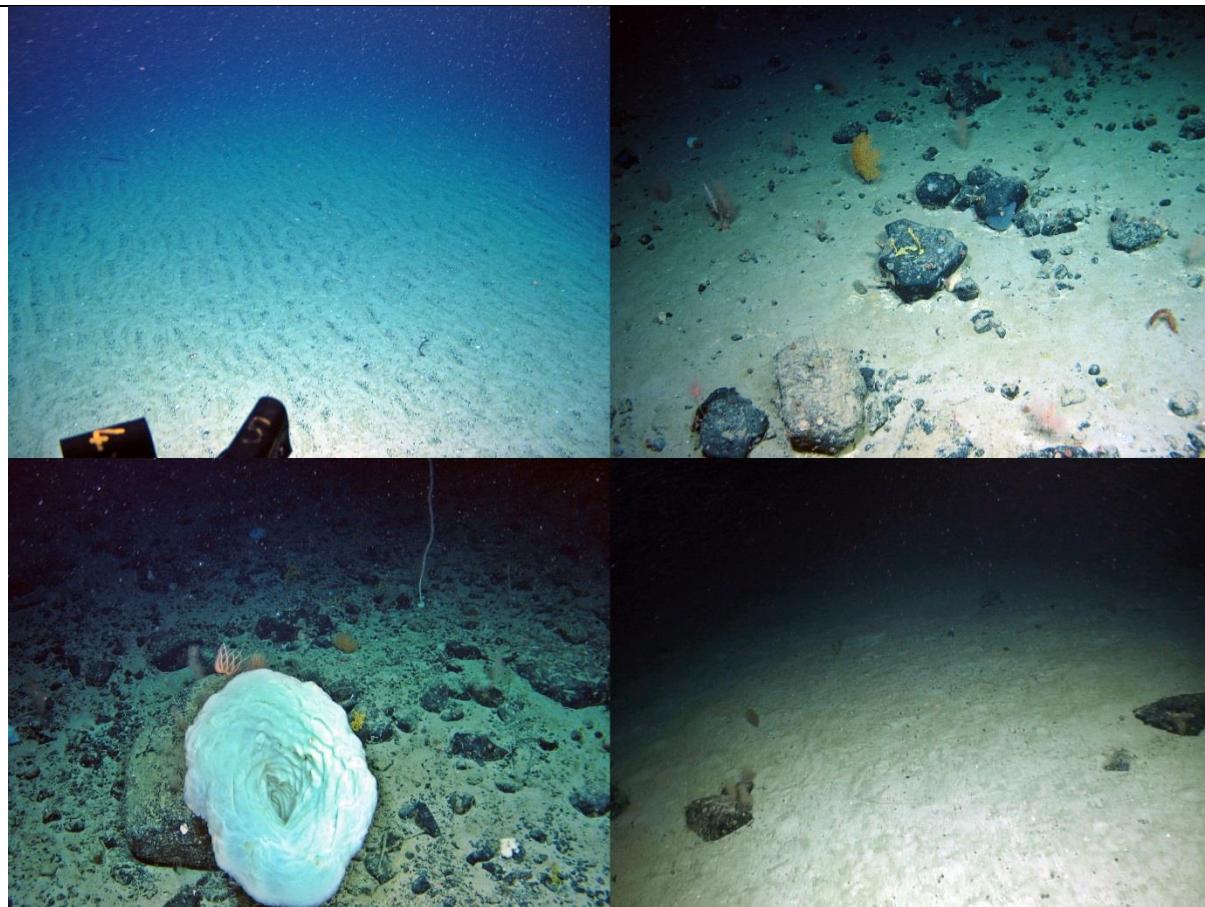
	Start	End
Date & Time	08/07/2017 11:33:53	08/07/2017 13:03:39
Latitude/ Longitude	54.28479, -11.93313183	54.29487833, -11.9423867
Depth	2044.98	1893.51
Images	IMG_4605-IMG_4627.JPG	
Samples	2 x pushcores	

Location	C8
Target Features	Canyon, Escarpment
Depth Range	1893.26-2048.05m (av. 2000.015m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Sparse seapens (*Anthoptilum sp* and *Halipteris cf finmarchia*) on rippled mud and gravel. ((var) M.AtMB.Mu.SpnMeg)

Top R. Cobbles and boulders on carbonate slope with mixed corals, especially *Chrysogorgiidae sp.* Sea pens continue when the mud is deep enough. (M.AtLB.Ro.MixCor, (var) M.AtMB.Mu.SpnMeg)

Bottom L. Dense cobbles and boulders with pebbles and mud, mixed corals and sponges colonise this area with many *Lepidisis sp* whipcorals, and yellow zoanthids colonizing dead coral skeletons. (M.AtLB.Ro.MixCor)

Bottom R. Sparse boulders on mud with *Acanella arbuscula* colonising the soft sediment. (M.AtLB.Mu.EreCor.AcaArb, M.AtLB.Ro.MixCor)

Summary Description (habitat transitions noted)

HD VIDEO STARTS 0m/11:33am [1] The dive starts alongside a small carbonate protusion, possibly at a habitat transition, the carbonate hosts several massive sponge species, but the habitat is of insufficient size to count as a separate biotope. The majority of this area is soft/mixed sediment of rippled mud with gravel in the furrows with mixed sparse sea pens (*Anthoptilum sp* and *Halipteris cf finmarchia*). Rare boulders are also encountered. 1m ROV laterals right, 2m moves forward. 6m there is increasing shell hash and pebbles, reducing again at 9m. 12-20m stop for two pushcores. **40m [2]** Boulders and cobbles on mud, chrysogorgiids dominate. Brisingids are also abundant. Sea pens continue in the intermediate soft sediment. 58m-1h00m stop for imagery. **1h06m [3]** denser cobbles and boulders with pebbles and mud, mixed corals are the sole biotope, with abundant Chrysogorgiids, *Lepidisis sp*, and yellow zoanthids colonising dead coral skeletons. The landscape transitions to cobbles and boulders of varying density on sloping carbonate. The mud veneer is thin and the corals and sponges continue to dominate. 1h19m-1h20m stop for imagery. **1h23m [4]** the mud veneer deepens and boulders become sparse with Acanella dominating the soft muddy substrate and mixed corals continuing on the boulders. **HD VIDEO ENDS AT 1h29m/13:03pm**

Physical Data			
Reef (types can be concurrent)	37% Reef	37% geogenic n/a	n/a n/a
Substrates	- Boulders - Carbonate - Cobbles - Gravel - Mud - Shell hash		
Geomorphology/Features	- Canyon - Escarpment		
Annex 1 Types	- cobble/boulder field - sloping carbonate		
Pressures	- 1 x black plastic		

Biological Data				
Number of Species		56spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	F	
554	Actinernus sp	L	R	
605	Actiniaria sp 20	M	R	
930	Actinopterygii sp 3	M	R	
132	Actinostolidae sp 1	L	R	
1031	Anachalypsicrinus nefertiti	L	O	
278	Anthomastus grandiflorus	M	R	
594	Anthoptilum grandiflorum	L	C	
1120	Anthoptilum sp	L	R	
284	Bathypathes sp (brown)	L	O	
432	Benthogone sp (purple)	L	F	
6	Caryophyllia sp	M	R	
1142	cf Farreidae sp	L	R	
1174	cf Hymenaster sp (yellow)	L	R	
1008	Chrysogorgiidae sp 1	L	C	
540	Chrysopathes sp/Trissopathes	L	O	
577	Coryphaenoides guentheri	L	O	
566	Coryphaenoides rupestris	L	R	
194	Echinidae sp (pink)	M	R	
559	Echinidae sp (white)	M	R	
572	Echinothuroidea sp (whiteDee)	L	O	
1056	Flabellum sp	M	R	
601	Geodia cf baretti (Porifera mas	L	O	
622	Halipterus cf finmarchica	L	F	
1113	Halosauridae sp	L	R	
628	Holothuroidea sp 4	M	R	
1125	Hygrosoma sp	L	O	
274	Hymenodiscus coronata/ Brisir	L	F	
578	Keratoisis sp 2	L	R	
1067	Laucoraja sp	L	R	
557	Lepidisis sp	L	F	
383	Myxine glutinosa	L	R	
551	Ophiomuseum lymani	L	R	
1076	Ophiuroidea (indet)	M	R	
1042	Parantipathes sp (unbranched)	L	R	
1083	Pennatulacea sp (thin)	L	R	
552	Polyacanthonotus rissoanus	L	R	
1030	Polymastia cf boletiformis	L	R	
263	Porania pulvillus (poss stormi)	L	O	
535	Porifera cup 2	L	O	
800	Porifera encrusting (blue)	Crust	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
30	Porifera encrusting sp 10 (yellc	Crust	R	
606	Porifera lamellate sp 9	L	O	
576	Porifera massive lobose sp 18	L	R	
611	Porifera massive lobose sp 21	L	R	
611	Porifera massive lobose sp 21	L	R	
83	Porifera massive lobose sp 6 (L	O	
380	Porifera tubular (cf Asconema	L	R	
433	Pseudarchaster sp 1	L	O	
573	Solaster endeca	L	O	
547	Stauropathes arctica	L	O	
440	Synaphobranchus kaupii	L	F	
261	Syringammina fragilissima	M	R	
1149	Zoanthidea sp (sweetcorn)	Mass	O	
291	Zoarcidae sp 2	L	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var) M.AtMB.Mu.SpnMeg	(lower bathyal mixed substrate variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
M.AtLB.Mu.EreCor.AcaArb	Acanella arbuscula assemblage on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft- bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard- bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)

Biotope progression per habitat transition (# species, dominant/characteristic species)

1	(var) M.AtMB.Mu.SpnMeg 594 <i>Anthoptilum gradiflorum</i> , 622 <i>Halipterus cf finmarchica</i>
2	M.AtLB.Ro.MixCor, (var) M.AtMB.Mu.SpnMeg 1008 <i>Chrysogorgidae</i> sp 1, 594 <i>Anthoptilum gradiflorum</i> , 622 <i>Halipterus cf finmarchica</i>
3	M.AtLB.Ro.MixCor 1008 <i>Chrysogorgidae</i> sp 1, 1149 <i>Zoanthidea</i> sp (sweetcorn), 557 <i>Lepidisis</i> sp
4	M.AtLB.Mu.EreCor.AcaArb, M.AtLB.Ro.MixCor 585 <i>Acanella arbuscula</i> , 1008 <i>Chrysogorgidae</i> sp 1

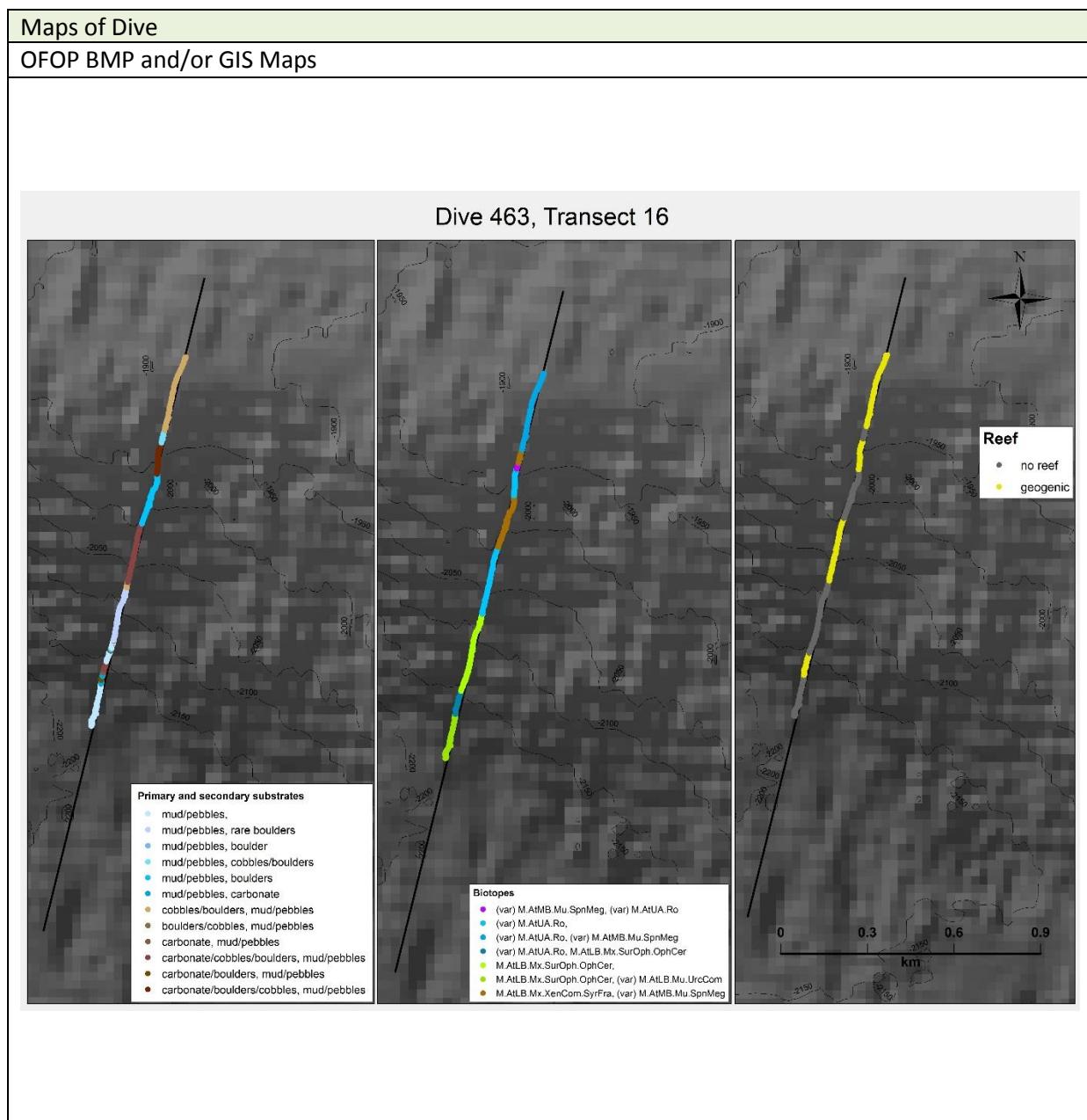
Conservation Targets	
Listed Habitats Encountered	
Name	Authority
Coral gardens (ICES/OSPAR); - Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens - Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens	ICES/OSPAR ICES subcategory ICES subcategory
Sea-pen and burrowing megafauna communities Seapen fields	OSPAR ICES
Listed Species Encountered (Fish, Count)	
	IUCN/ OSPAR

Additional Comments	
- Sparse seapens on rippled sediment, then mixed corals on cobbles/boulders, Acanella upper slope	

DIVE SUMMARY	
DIVE #	TRANSECT #
463	16

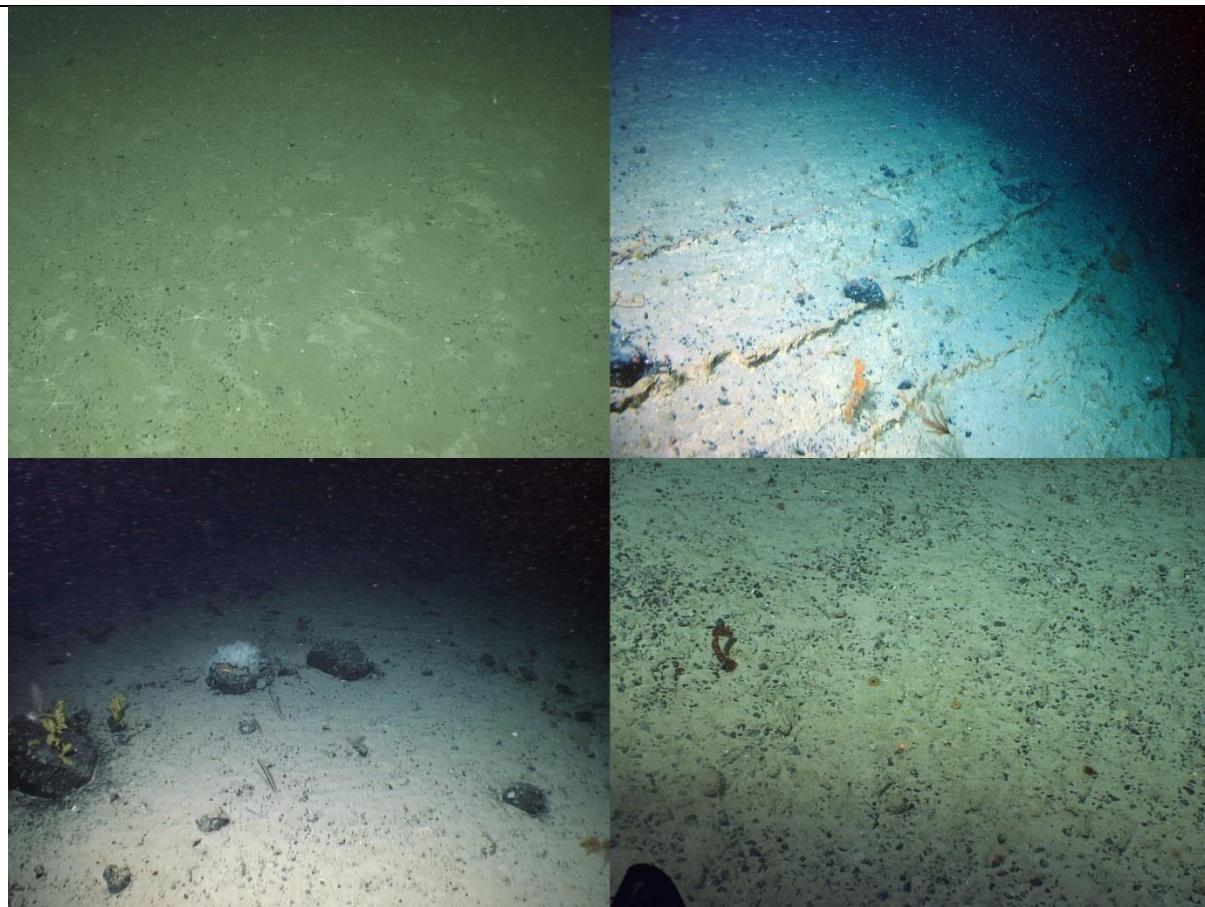
	Start	End
Date & Time	08/07/2017 17:59:35	08/07/2017 19:48:49
Latitude/ Longitude	54.378665, -11.717654	54.39045567, -11.7114357
Depth	2183.87	1894.14
Images	IMG_4638-IMG_4680.JPG	
Samples	1 x cf Anthoptilum sp, 2 x pushcores	

Location	C7
Target Features	Canyon, Escarpment
Depth Range	1890.61-2183.87m (av. 2023.059m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The dive starts on mixed substrate (mud/pebbles) with *Ophiomuseum lymani* and white echinoids (OTU559).

Top R. There are large areas of steep carbonate or cobbles and boulders with stalked crinoids (especially *Porphyrocrinus thalassae* seen at bottom centre of image) and mixed corals.

Bottom L. Towards the end of the dive the boulders and cobbles hosted mixed stalked crinoids corals and sponges while the mixed mud and pebbles substrate hosted sea pens (especially *Halipterus cf finmarchica* as seen here)

Bottom R. The mixed substrate at times also hosted xenophyophores (*Syringammina fragilissima*) and sea pens (here cf *Anthoptilum* sp OTU1107), similar to the assemblage seen in transect 6.

Summary Description (habitat transitions noted)

START OF HD VIDEO 0m/17:59:35 [1] Dive starts properly after 1m. Area is mixed mud and pebbles. *Ophiomuseum lymani* and white echinoids (OTU559) are abundant. 4m Similar to T37 there is an aggregation of juvenile/small jellyfish (black/red) which the ROV passes through. **13m [2]** areas of sloping carbonate or boulders are mosaicked with mixed mud and pebbles. Stalked crinoids, especially *Porphyrocrinus thalassae*, and *O. lymani* dominate hard and mixed substrates respectively. **18m [3]** An extended area of *O. lymani* on mixed substrate, a couple of carbonate protrusions and rare cobbles/boulders are not heavily colonised. **34m [4]** Landscape steeper, geogenic reef of cobbles/boulders and sloping carbonate. Mixed stalked crinoids dominate, with mixed erect corals (gorgonians/antipatharians). **48m [5]** still on a steep slope, the mixed sediment dominates with xenophyophores (*Syringammina fragilissima*) and seapens especially cf *Anthoptilum* sp (OTU1107) both abundant. Sparse boulders continue with little associated fauna. 52m-1h08m stopped to sample cf *Anthoptilum* sp and two pushcores. 1h10m-1h13m stopped for imagery of *Leiopathes* sp and litter entangled (DHL). **1h21m [6]** dense cobbles and boulders on steep slope, mosaicked with areas of steep carbonate. Again stalked crinoids and mixed corals dominate, although here *Anacalypsicrinus nefertiti* and uncoiled *Stichopathes* sp (OTU560) are the most prolific species. **1h27m [7]** the slope is still steep, mixed mud and pebbles host sea pens (especially *Halipteris cf finmarchica*) and *Acanella arbuscula*, with continued mixed corals, stalked crinoids and sponges on boulders. **1h29m [8]** fewer boulders, xenophyophores and seapens are dominant, although *Acanella arbuscula* is also still abundant. Images reveal that cup corals are very abundant also but these are unclear from the video. **1h32m [9]** boulders and cobbles denser, with mixed corals, sponges and stalked crinoids, while the mixed substrate is dominated by sea pens, cup corals still abundant in images. 1h47m Stop for imagery until **END OF HD VIDEO 1h49m/19:48:49.**

Physical Data			
Reef (types can be concurrent)	41% reef	41% geogenic	
		n/a	n/a
			n/a
Substrates	<ul style="list-style-type: none"> - boulders - carbonate - cobbles - mud/pebbles 		
Geomorphology/Features	<ul style="list-style-type: none"> - Canyon - Escarpment 		
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder field - sloping carbonate 		
Pressures	<ul style="list-style-type: none"> - 2 x plastic (inc DHL packaging) 		

Biological Data				
Number of Species		77spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	F	
554	Actinernus sp	L	R	
605	Actiniaria sp 20	M	O	
1047	Actinoscyphidae sp 1 (pink)	L	R	
132	Actinostolidae sp 1	L	O	
1066	Adamsia sp (Paguridae Associated)	M	R	
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	O	
1031	Anachalypsicrinus nefertiti	L	F	
278	Anthomastus grandiflorus	M	R	
592	Antipatharia sp 4 cf Stauropathes	L	O	
1038	Asconema sp	L	R	
650	Asconema sp (Porif mass glob 14)	L	R	
1173	Astroidea (cf Ceremaster/Hymenaster, red/c M	M	R	
1171	Astroidea sp (pinkDeepSed)	M	R	
471	Asteronyx loveni	M	R	
1041	Bathycriinidae sp 1	L	F	
1045	Bathycriinidae sp 2 cf Porphyrocrinus thalassa	L	F	
284	Bathypathes sp (brown)	L	R	
328	Bathypathes sp 1	L	O	
1058	Caryophyllidae/Fabellidae (indet)	M	F	
1107	cf Anthoptilum sp	L	F	
289	cf Clavulariidae sp	Mass	R	
1176	cf Grimpoteuthis sp	M	R	
1049	cf Psolus sp	M	R	
1086	cf Thouarella sp?	L	R	
1008	Chrysogorgiidae sp 1	L	C	
1059	Colossendeis sp	L	O	
1105	Coryphaenoides armatus	L	O	
577	Coryphaenoides quenqueri	L	O	
131	Crinoidea sp 1	M	O	
1103	Democrinus sp	M	O	
559	Echinidae sp (white)	M	O	
572	Echinothuroidea sp (whiteDeep)	L	O	
1056	Flabellum sp	M	R	
174	Gaidropsarus argentatus	L	R	
601	Geodia cf baretti (Porifera massive globose s	L	R	
622	Halipterus cf finmarchica	L	F	
1154	Henricia sp (deep)	M	R	
432	Holothuroidea (cf Laetmogone) (purple)	L	F	
1179	Holothuroidea sp (pinkDeep)	L	O	
628	Holothuroidea sp 4 (cf Amperima)	M	R	
274	Hymenodiscus coronata/ Brisinga endacacne	L	F	
1067	Laucoraja sp	L	R	
305	Leiopathes sp	L	R	
557	Lepidisis sp	L	O	
536	Mesothuria intestinalis	M	R	
1026	Mysida (indet)	S	R	
551	Ophiomuseum lymani	L	C	
205	Paguridae spp	M	R	
1050	Paramuricea sp	L	O	
1161	Parantipathes sp (branched)	L	O	
1042	Parantipathes sp (unbranched)	L	O	
1167	Peniagone sp?	M	R	
1046	Pennatula acculeata	L	F	
255	Phelliactis sp 1	L	O	
552	Polyacanthonotus rissoanus	L	O	
1030	Polyamia cf boletiformis	L	O	
535	Porifera cup 2	L	O	
800	Porifera encrusting (blue)	Crust	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
1128	Porifera globose (muddy)	L	R	
1178	Porifera globose/lobose (indetWhite)	L	O	
1156	Porifera lamellate (bubbles)	L	R	
1177	Porifera lamellate (indetWhite)	L	O	
1053	Porifera lamellate sp 13	L	O	
576	Porifera massive lobose sp 18(cf Farrea sp)	L	O	
83	Porifera massive lobose sp 6 cf Geodia sp	L	O	
433	Pseudarchaster sp 1	M	R	
1134	Scyphozoa sp (indet)	M	R	
573	Solaster endeca	L	R	
547	Stauropathes arctica	L	F	
560	Stichopathes sp	L	O	
440	Synapobranchus kaupii	L	R	
261	Syringammina fragilissima	M	O	
1043	Telopathes sp	L	R	
1149	Zoanthidea sp (sweetcorn)	Mass	R	
291	Zoarcidae sp 2	L	O	

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var) M.AtMB.Mu.SpnMeg	(lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
(var) M.AtUA.Ro	(Stalked crinoids, sponges, and corals on) Atlantic upper abyssal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Mx.SurOph.OphCer	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
M.AtLB.Mx.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mixed sediment	Mud and sand emergent fauna (ICES);
(var) M.AtLB.Mu.UrcCom	(Upper abyssal mixed substrate variant) Urchin dominated community on Atlantic lower bathyal mud	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mx.SurOph.OphCer, (var) M.AtLB.Mu.UrcCom 551 Ophiomuseum lymani, 559 Echinidae sp (white)	
2	(var) M.AtUA.Ro, M.AtLB.Mx.SurOph.OphCer 1045 Porphyrocrinus thalassae, 551 Ophiomuseum lymani	
3	M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
4	(var) M.AtUA.Ro 1045 Porphyrocrinus thalassae	
5	M.AtLB.Mx.XenCom.SyrFra, (var) M.AtMB.Mu.SpnMeg 261 Syringammina fragilissima, 1107 cf Anthoptilum sp	
6	(var) M.AtUA.Ro 560 Stichopathes sp, 1031 Anachalypsicrinus nefertiti	
7	(var) M.AtMB.Mu.SpnMeg, (var) M.AtUA.Ro 622 Halipteris cf finmarchica, 585 Acanella arbuscula, 1008 Chrysogorgiidae sp	
8	M.AtLB.Mx.XenCom.SyrFra, (var) M.AtMB.Mu.SpnMeg 261 Syringammina fragilissima, 622 Halipteris cf finmarchica, 585 Acanella arbuscula	
9	(var) M.AtUA.Ro, (var) M.AtMB.Mu.SpnMeg 1008 Chrysogorgiidae sp, 622 Halipteris cf finmarchica, 585 Acanella arbuscula	

Conservation Targets

Listed Habitats Encountered		
Name	Authority	
Sea-pen and burrowing megafauna communities	OSPAR	
Seapen fields	ICES	
Coral gardens	ICES/OSPAR	
- Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	ICES subcategory	
Mud and sand emergent fauna	ICES	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments	
<ul style="list-style-type: none"> - Steep carbonate and cobbles/boulders with stalked crinoids/mixed corals, patchy xenophyophores/sea pens - There is a lot of particulate matter in the water column throughout this dive. - Much of this dive is spent too high off the bottom for clear IDs. 	

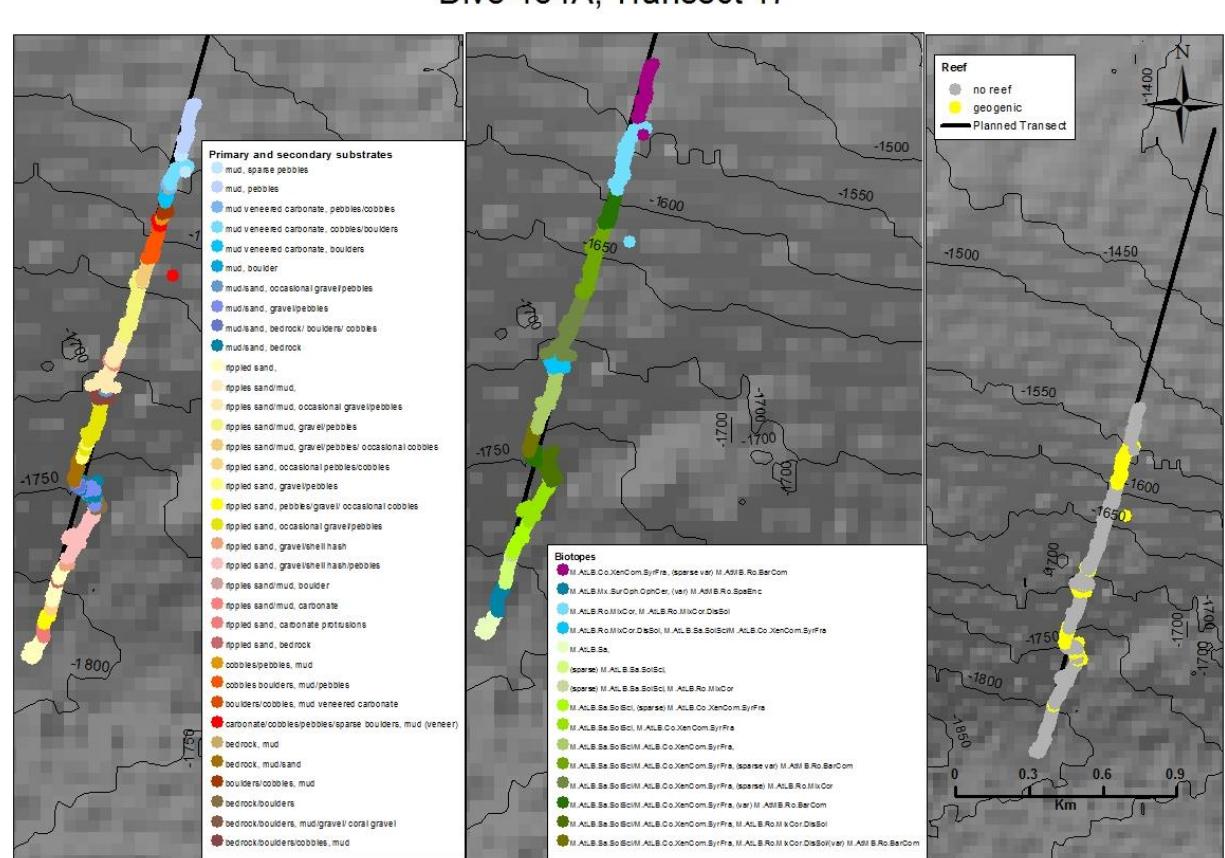
DIVE SUMMARY	
DIVE #	464A

	Start	End
Date & Time	09/07/2017 00:20:56	09/07/2017 02:23:21
Latitude/ Longitude	54.38001233, -11.56902233	54.39231483, -11.56190533
Depth	1802.46	1518.06
Images	IMG_4683-IMG_4742	
Samples	N/A	

Location	C7
Target Features	Canyon, Escarpment [<i>Solenosmilia</i>]
Depth Range	1517.69-1802.87 (av 1696.61)m

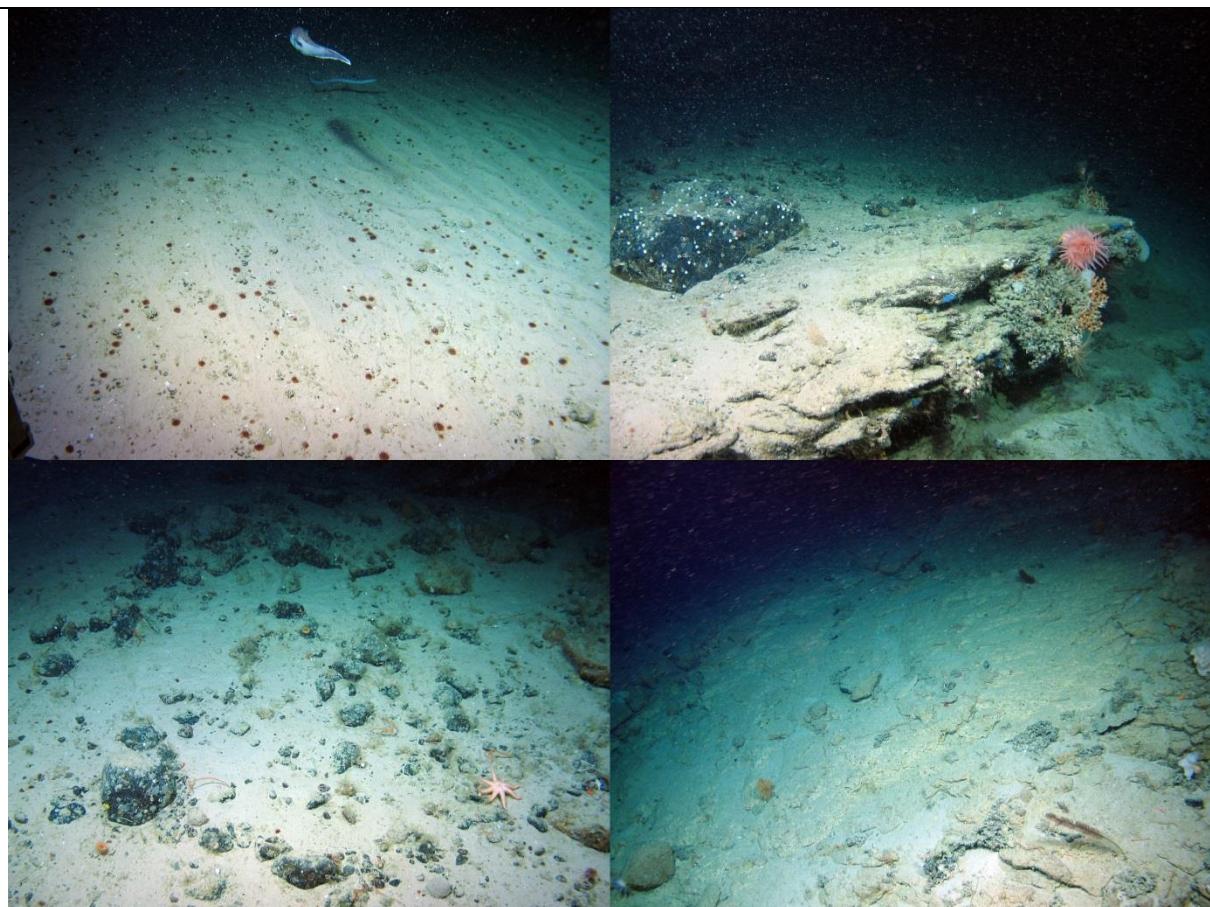
Maps of Dive

OFOP BMP and/or GIS Maps



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The vast majority of this dive traversed rippled epifaunally divers soft sediment with fields of abundant cup corals (*Caryophyllidae*) and Xenophyophores (*Syringammina fragillissima*) of varying density. (M.AtLB.Sa.SolScl/M.AtLB.Co.XenCom.SyrFra)

Top R. Outcroppings of bedrock were periodically encountered populated by *Solenosmilia variabilis*, mixed corals, and encrusting fauna. Less mud-veneered protrusions and boulders were dominated by barnacles, although mixed corals were still present. As these co-occurred this was considered a mosaic of hard substrate biotopes. (M.AtLB.Ro.MixCor.DisSol/(lower bathyal variant of) M.AtMB.Ro.BarCom)

Bottom L. In the second half of the transect, there were a few areas where the hard substrate displayed as cobbles and boulders, here presenting with mixed corals and encrusting fauna (M.AtLB.Ro.MixCor) but barnacle encrusted cobble/boulder fields were also encountered.

Bottom R. The steep slope areas near the end of the transect displayed mud veneered carbonate with mixed corals (mainly *Stichopathes* sp). (M.AtLB.Ro.MixCor)

Summary Description (habitat transitions noted)

0m/00:20am [1]: The transect starts on rippled sand with no obvious dominant epifauna.

7m/00:28am [2]: Areas of sparsely encrusted carbonate crust become apparent under the sand, and *Ophiomuseum lymani* ophrioids are frequently encountered. **12m/00:33am [3]** the rippled sand, now with occasional pebbles starts to host a field of solitary cup corals **16m/00:37 [4]** the transect bisects a small bedrock shelf/escarpment with mixed corals **16m/00:37 [5]**: then continues into more cup corals on rippled sand, now with increasing densities of xenophyophores (*Syringamma fragilissima*). **25m/00:46am [6]**: A large bedrock outcropping is encountered with rich encrusting fauna and *Solenomilia variabilis* colonies. From here several further bedrock shelves are met, hosting similar fauna, with cup corals and xenophyophores on the terraces between them. **42m/01:03am [7]**: While similar features are encountered, the hard substrate starts to be dominated by barnacles, although mixed corals still co-occur. Cup coral/xenophyophore terraces continue. **45m/01:06 am [8]** A more substantial escarpment is met and traversed along. The hard substrate here displays both mixed corals and *Solenosmilia variabilis* and dense barnacles (thought of as separate biotopes in the mid-bathyal). **50m/01:11am [9]** a longer period is spent over rippled sand and the cup coral/xenophyophore aggregations. **59m/01:21am [10]** further terraces of bedrock are encountered, here with *S. variabilis* dominating the vertical shelves and the cup corals/xenophyophores on rippled sand/pebbles between. **1h13m/01:34am [11]** above the top terrace, the cup corals/xenophyophores continue with rare boulders displaying mixed corals (e.g. *Paramuricea* sp, and *Chrysogorgiidae* sp). One orange roughy (*Hoplostethus atlanticus*) is encountered. Increasing pebbles lead to **1h27m/01:48 [12]** areas of cobbles/boulders encrusted predominantly by barnacles although mixed corals are also present. These increase in density until reaching the foot of a steeper slope at **1h43m/02:04am [13]** here the soft sediment is a veneer over carbonate rock and is dominated by *Stichopathes* sp corals, exposed rock, boulders and cobbles display more mixed corals including discrete *Solenosmilia variabilis* colonies. **1h55m/02:16am [14]** The top of the slope is reached, resuming rippled sand now with dense xenophyophores and rare boulders dominated by barnacles. The transect **ends at 2h2m/02:23am.**

Physical Data			
Reef (types can be concurrent)	40% reef	40 % geogenic	
		n/a	n/a
Substrates	<ul style="list-style-type: none"> - bedrock - boulders - carbonate - cobbles - gravel - mud - pebbles - sand (rippled) - shell hash 		
Geomorphology/Features	<p>Canyon</p> <ul style="list-style-type: none"> - bedrock protrusions - bedrock shelf - boulders <p>Escarpment</p> <ul style="list-style-type: none"> - bedrock protrusions/boulders/cobbles - sloping carbonate - terraced bedrock 		
Annex 1 Types	<ul style="list-style-type: none"> - boulder/cobble fields - flat/sloping bedrock - horizontal ledges - vertical rock walls 		
Pressures	<ul style="list-style-type: none"> - 3 x metal - 1 x rope - 1 x plastic 		

Biological Data					
Number of Species		91			
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)					
O.T.U.	Name	Size	SACFOR		
585	Acanella arbustula	L	F		
1062	Acesta excavata	M	R		
554	Actinermus sp	L	O		
4	Actiniaria sp 1	M	O		
605	Actiniaria sp 20	S	R		
132	Actinostolidae sp 1	L	F		
1066	Adamsia sp (Paguridae Associated)	M	O		
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	O		
1031	Anachalypsicrinus nefertiti	L	O		
278	Anthomastus grandiflorus	M	O		
311	Anthothelia grandiflora	Mass	R		
592	Antipatharia sp 4 cf Stauropathes	L	R		
146	Aphroditidae sp 1	M	R		
20	Ascidiae sp 2	M	R		
471	Asteronyx loveni	M	O		
1041	Bathycriinidae sp 1	M	O		
1045	Bathycriinidae sp 2 cf Porphyrocrinus thalassae	M	R		
284	Bathypathes sp (brown)	L	O		
432	Benthopogone sp	M	O		
12	Belocera tuediae	L	R		
34	Brachiopoda	S	R		
1077	Caridea (indet)	M	R		
6	Caryophyllia sp	S	R		
1058	Caryophyllidae/Fabellidae (indet)	M	C		
2	Ceriantharia	S	R		
1008	Chrysogorgidae sp 1	L	O		
82	Cirripedia sp	Mass	O		
1059	Colossendeis sp	L	O		
113	Colus sp	M	R		
577	Coryphaenoides guentheri	L	F		
566	Coryphaenoides rupestris	L	F		
1072	Crinoidea sp (10 arm)	L	R		
131	Crinoidea sp 1	S	R		
131	Crinoidea sp 1 (red)	M	R		
335	Desmophyllum cf dianthus	M	O		
572	Echinoidea sp 5	L	R		
1052	Echinus sp (deep, white/pink)	M	R		
649	Eknomisis sp	L	O		
1056	Flabellum sp	M	R		
628	Holothuriidea sp 4	M	R		
651	Hoplostethus atlanticus	L	R		
1039	Hydrolagus cf affinis	L	O		
274	Hymenodiscus coronata/ Brisinga endacastrensis	L	O		
1078	Iopidae sp	M	O		
578	Keratoisis sp 2	L	R		
305	Leiopathes sp	L	O		
249	Lepidion eques	L	R		
557	Lepidisis sp	L	O		
1055	Liponema sp	L	R		
349	Mora moro	L	O		
339	Munida tenuimana	M	R		
383	Myxine glutinosa	L	O		
563	Neocytthus helgae	L	O		
659	Octopodidae (indet)	L	R		
551	Ophiomuseum lymani	L	F		
1076	Ophiuroidea (indet)	S	R		
1036	Ophiuroidea sp 11 (red disc)	M	R		
205	Paguridae spp	M	O		
1050	Paramureicea sp	L	F		
1042	Parantipathes sp	L	O		
1046	Pennatula sp (deep)	L	O		
436	Pentametrocrinus atlanticus	L	O		
202	Phakellia ventillabrum	L	O		
255	Phelliactis sp 1	L	R		
552	Polyacanthonotus rissoanus	L	O		
1030	Polymastia cf boletiformis	L	O		
263	Porania pulvillus	M	R		
1075	Porifera cylindrical sp	L	O		
800	Porifera encrusting (blue)	Crust	R		
1	Porifera encrusting sp 1 (white)	Crust	R		
30	Porifera encrusting sp 10 (yellow)	Crust	R		
1010	Porifera lamellate sp 12 (solen Assoc)	L	O		
1053	Porifera lamellate sp 13	L	O		
606	Porifera lamellate sp 9	L	O		
1051	Porifera massive globose sp 15 (solenRubbleAssoc)	M	O		
576	Porifera massive lobose sp 18(cf Farrea sp)	L	R		
204	Reteporella sp 1	M	R		
1079	Rhodaliidae sp	M	R		
106	Serpulidae sp 1	M	R		
573	Solaster endeca	L	O		
700	Solenosmilia variabilis	L	O		
569	Squaliformes sp	L	O		
547	Stauropathes arctica	L	O		
198	Stichastrella rosea	M	R		
560	Stichopathes sp	L	C		
440	Synaphobranchus kaupii	L	O		
261	Syringammina fragilissima	M	F		
581	Umbellula sp	L	R		
1027	Unknown hydrozoa or annelida	Mass	O		
259	Zoarcidae sp 1	M	R		
291	Zoarcidae sp 2	L	O		

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
M.AtLB.Co.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal coarse sediment	Mud and sand emergent fauna (ICES)
M.AtLB.Mx.SurOph.OphCer	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
(var) M.AtMB.Ro.BarCom	(lower bathyal variant of) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Ro.MixCor.DisSol	Discrete Solenosmilia variabilis colonies on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
(var) M.AtMB.Ro.SpaEnc	(lower bathyal variant of) Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata	
M.AtLB.Sa.SolScl	Solitary scleractinian field on Atlantic lower bathyal sand	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Cup-coral fields (ICES subcategory);
M.AtLB.Sa	Atlantic lower bathyal sand	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Sa (rare) 1058 Caryophyllidae/Fabellidae (indet)	
2	M.AtLB.Mx.SurOph.OphCer, (var) M.AtMB.Ro.SpaEnc 551 Ophiomuseum lymani	
3	(sparse) M.AtLB.Sa.SolScl (sparse) 1058 Caryophyllidae/Fabellidae (indet)	
4	(sparse) M.AtLB.Sa.SolScl, M.AtLB.Ro.MixCor 1050 Paramuricea sp	
5	M.AtLB.Sa.SolScl, M.AtLB.Co.XenCom.SyrFra 1058 Caryophyllidae/Fabellidae (indet), 261 Syringammina fragilissima	
6	M.AtLB.Sa.SolScl/M.AtLB.Co.XenCom.SyrFra, M.AtLB.Ro.MixCor.DisSol 1058 Caryophyllidae/Fabellidae (indet), 700 Solenosmilia variabilis	
7	M.AtLB.Sa.SolScl/M.AtLB.Co.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 1058 Caryophyllidae/Fabellidae (indet), 82 Cirripedia	
8	M.AtLB.Sa.SolScl/M.AtLB.Co.XenCom.SyrFra, M.AtLB.Ro.MixCor.DisSol/ (var) M.AtMB.Ro.BarCom	

	1058 Caryophyllidae/Fabellidae (indet), 700 Solenosmilia variabilis/ 82 Cirripedia
9	M.AtLB.Sa.SolScl/M.AtLB.Co.XenCom.SyrFra, 1058 Caryophyllidae/Fabellidae (indet), 261 Syringammina fragilissima
10	M.AtLB.Ro.MixCor.DisSol, M.AtLB.Sa.SolScl/M.AtLB.Co.XenCom.SyrFra, 700 Solenosmilia variabilis, 1058 Caryophyllidae/Fabellidae (indet)
11	M.AtLB.Sa.SolScl/M.AtLB.Co.XenCom.SyrFra, (sparse) M.AtLB.Ro.MixCor 1058 Caryophyllidae/Fabellidae (indet)
12	M.AtLB.Sa.SolScl/M.AtLB.Co.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 1058 Caryophyllidae/Fabellidae (indet), 82 Cirripedia
13	M.AtLB.Ro.MixCor, M.AtLB.Ro.MixCor.DisSol 560 Stichopathes sp, 700 Solenosmilia variabilis
14	M.AtLB.Co.XenCom.SyrFra, (sparse var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima

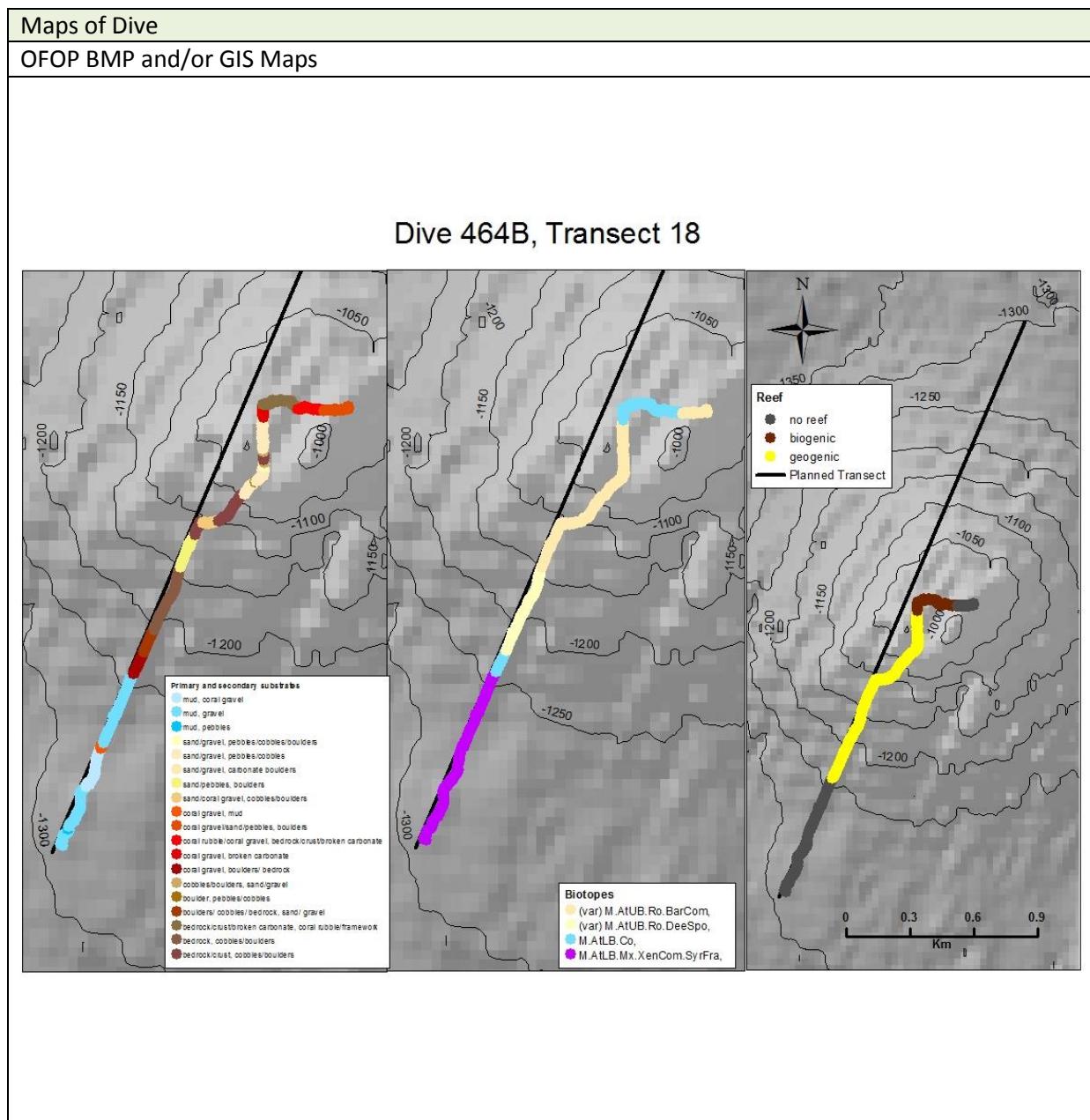
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Mud and sand emergent fauna	ICES	
Coral gardens	ICES/ OSPAR	
- Hard-bottom coral garden: Colonial scleractinians on rocky outcrops	ICES Subcategory	
- Hard-bottom gorgonian and black coral gardens (ICES subcategory)	ICES Subcategory	
Listed Species Encountered (Fish, Count)		
Hoplostethus atlanticus	1	OSPAR/IUCN

Additional Comments		
- Epifaunally diverse sediment (cup corals, xenophyophores) on terraces between bedrock outcroppings with Solenosmilia and mixed corals. Some areas of cobble/boulders and veneered carboante with mixed corals.		

DIVE SUMMARY	
DIVE #	TRANSECT #
464B	18

	Start	End
Date & Time	09/07/2017 04:24:10	09/07/2017 06:22:01
Latitude/ Longitude	54.39621783, -11.5253325	54.40797517, -11.5105787
Depth	1281.33	989.85
Images	IMG_4801-IMG_4875.JPG	
Samples	n/a	

Location	NW of C7
Target Features	Carbonate mound
Depth Range	947.67-1281.43m (av. 1102.840m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The dive starts on mixed gravel/mud with xenophyophores (*Syringammina fragilissima*).

Top R. There are huge numbers of Orange Roughy (*Hoplostethus atlanticus*) on this dive occupying the lower slope areas of this carbonate mound. These animals have been witnessed changing colour from orange/red to white and back (Lorance et al 2002). Various colour states were seen in this area (in this image most are white/intermediate, the tail of the fish on the left showing the traditional red coloration seen when caught).

Bottom L. The hard substrate areas of the lower slope of this carbonate mound are colonised mainly by sponge aggregations, both encrusting and lamellate/cup (e.g. *Axinella infundibuliformis*). Some mixed corals (such as the *Leiopathes* sp in this image, and *Acanthogorgia* sp) are also present but not dominant.

Bottom R. The top of the carbonate mound incorporates areas of steep coral gravel slope, carbonate crust, and depressions containing *Lophelia pertusa* coral rubble/framework which is 100% dead. Juvenile *Synaphobranchus kaupii* are very abundant up here, amongst other fish species, but the *H. atlanticus* is no longer present.

Summary Description (habitat transitions noted)

HD VIDEO STARTS 0m/04:24:10[1] The transect starts above Canyon 7 on the seabed at the base of a carbonate mound. The substrate is mixed mud/gravel/pebbles and patchy xenophyophore (*Syringammina fragilissima*) aggregations dominate the area. 1m ROV starts moving right, slightly uphill. 2m ROV moves forward. 11-18m some coral gravel is also present in varying density. Roughy are present but few. **30m [2]** coral gravel with boulders and bedrock protrusions, no obvious dominant epifauna but roughy found in increasing numbers. **34m [3]** boulders /bedrock protrusions and cobbles with sand/gravel then 38m bedrock with cobbles and boulders. This area is dominated by hard bottom sponge aggregations, especially encrusting and lamellate morphs of varying colour (e.g. *Phakellia ventillabrum*). Orange roughy are at their densest here, and found in multiple colorations (Lorance et al 2002 witnessed individual roughy changing colours between white and red) suggestive of some behavioural or physiological processes. The vast majority encountered had white or intermediate colorations, but some traditional red/orange individuals were also seen. **50m [4]** transition to alternating sand/pebbles/ boulders and areas of bedrock/carbonate crust with cobbles and boulders. The roughy continue to be abundant, but the hard substrate is dominated by barnacles and appears less diverse. Some areas of coral gravel in the mixed substrate. 1h17m no more roughy encountered, the ROV continues to climb the slope of the carbonate mound. **1h31m [5]** coral gravel dominates with broken carbonate also present, no obvious assemblage defining epifauna, but Chaceon affinis is frequently encountered. Juvenile *Synaphobranchus kaupii* eels are however very abundant, as are juvenile *Apristurus* sp sharks. 1h33m The mound summit area displays carbonate crust with broken depressions filled with (likely) *Lophelia pertusa* coral rubble/framework (100% dead). 1h37m summit reached, ROV starts moving downslope. 1h48m-1h49m stopped to test sediment for pushcores. **1h51m [6]** mixed sediment of coral gravel/sand/pebbles and boulders continue downslope with barnacles on larger rocks and still many juvenile *S. kaupii*. 1h55m again stop to test for pushcore but coarse coral mixed substrate still not suitable. **HD VIDEO ENDS AT 1h57m/06:22:01.**

Physical Data			
Reef (types can be concurrent)	73% reef	51% geogenic	
		22% biogenic	0% living
			100% dead
Substrates	<ul style="list-style-type: none"> - bedrock - boulders - carbonate crust - cobbles - coral gravel - coral framework - coral rubble - gravel - mud - pebbles - sand 		
Geomorphology/Features	<p>Carbonate Mound Base Carbonate Mound</p> <ul style="list-style-type: none"> - summit area - summit downslope 		
Annex 1 Types	<ul style="list-style-type: none"> - Mound summit/high slope areas - coral rubble fields - cobble/boulder fields - broken rock 		
Pressures	<p>Extended coral gravel areas may have been trawled at some point to present as such fine grains but no trawl marks are apparent anywhere on the dive.</p>		

Biological Data					
Number of Species		69spp			
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)					
O.T.U	Name	Size/Growth	SACFOR		
585	Acanella arbuscula	L	O		
608	Acanthogorgia cf armata	L	O		
605	Actiniaria sp 20	M	R		
930	Actinopterygii sp 3	M	R		
1066	Adamsia sp (Paguridae Associated)	M	R		
311	Anthothelia grandiflora	Mass	R		
1131	Apristurus sp (indet) - juv	L	F		
403	Axinella infundibuliformis	L	O		
235	Bathynectes sp	L	R		
6	Caryophyllia sp	M	R		
1048	Centrophorus squamosus	L	R		
234	Ceremaster/Peltaster/Plinthaster sp 1	M	R		
2	Ceriantharia	M	R		
1129	cf Echinus (deepPinkSpine)	M	R		
1174	cf Hymenaster sp (yellow)	L	R		
254	Chaceon affinis	L	F		
653	Chimera opalescens	L	O		
1054	Chirostylidae (indet)	M	R		
211	Cidaris cidaris	M	R		
82	Cirripedia sp	Mass	R		
303	Coelorrhynchus coelorrhynchus	L	O		
1059	Colossendeis sp	L	R		
566	Coryphaenoides rupestris	L	O		
128	Cottunculus microps	L	R		
1015	Dendrobathypathes sp	L	O		
649	Eknomisis sp	L	R		
1018	Epigonus telescopus	L	R		
208	Henricia sanguinolenta	M	R		
432	Holothuroidea (cf Laetmogone) (purple)	L	R		
651	Hoplostethus atlanticus	L	C		
1024	Hydrolagus cf mirabilis	L	O		
56	Hydrozoa flat/branched	L	R		
1067	Laucoraja sp	L	R		
305	Leiopathes sp	L	O		
249	Lepidion eques	L	F		
273	Lophius piscatorius	L	R		
11	Majidae sp 1	S	R		
1019	Merlangius merlangus	L	R		
245	Molva dypterygia	L	O		
339	Munida tenuimana	M	R		
563	Neocyttus helgae	L	F		
1009	Notacanthidae sp 1 (Notacanthus cherni	L	R		
659	Octopodidae (indet)	L	O		
205	Paguridae spp	M	R		
1050	Paramuricea sp	L	O		
202	Phakellia ventillabrum	L	O		
115	Porifera boring sp 1	Mass	R		
1164	Porifera cylindrical sp (rough)	L	R		
118	Porifera encrusting (black/red)	Crust	R		
800	Porifera encrusting (blue)	Crust	R		
13	Porifera encrusting (green)	Crust	R		
75	Porifera encrusting globose (pale)	Mass	F		
1	Porifera encrusting sp 1 (white)	Crust	R		
30	Porifera encrusting sp 10 (yellow)	Crust	R		
623	Porifera lamellate sp 10 (YellowSolenoA	L	R		
1010	Porifera lamellate sp 12 (solen Assoc)	L	R		
83	Porifera massive lobose sp 6 (cf Geodia	L	O		
433	Pseudarchaster sp 1	M	R		
1071	Pseudotriakidae microdon	L	O		
299	Pterasteridae sp	M	R		
652	Rajiformes sp 1 poss Neoraja caerulea	L	R		
106	Serpulidae sp 1	M	R		
700	Solenosmilia variabilis	L	O		
569	Squaliformes sp	L	O		
198	Stichastrella rosea	M	R		
440	Synaphobranchus kaupii	L	C		
261	Syringammina fragilissima	M	F		
446	Trachychnus sp	L	O		
199	Velatida sp 1	M	R		

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var) M.AtUB.Ro.BarCom	(lower bathyal variant) Barnacle dominated community on Atlantic upper bathyal rock and other hard substrata	
(var) M.AtUB.Ro.DeeSpo	(lower bathyal variant) Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	Deep-sea sponge aggregations (ICES/OSPAR); Hard-bottom sponge aggregations (ICES subcategory)
M.AtLB.Co	Atlantic lower bathyal coarse sediment	
M.AtLB.Mx.XenCom.SyrFra	Syringamma fragilissima field on Atlantic lower bathyal mixed sediment	Mud and sand emergent fauna (ICES)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mx.XenCom.SyrFra 261 Syringamma fragilissima	
2	M.AtLB.Co 651 Hoplostethus atlanticus	
3	(var) M.AtUB.Ro.DeeSpo 75 Porifera encrusting/globose, 202 Phakellia ventillabrum, 651 Hoplostethus atlanticus	
4	(var) M.AtUB.Ro.BarCom 440 Synaphobranchus kaupii, 82 Cirripedia sp, 254 Chaceon affinis, (651 Hoplostethus atlanticus)	
5	M.AtLB.Co 440 Synaphobranchus kaupii, 254 Chaceon affinis	
6	(var) M.AtUB.Ro.BarCom 82 Cirripedia, 440 Synaphobranchus kaupii	

Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Mud and sand emergent fauna Deep-sea sponge aggregations - Hard-bottom sponge aggregations	ICES ICES/OSPAR ICES subcategory	
Listed Species Encountered (Fish, Count)		
<i>Hoplostethus atlanticus</i> <i>Centrophorus squamosus</i>	257 1	OSPAR/IUCN OSPAR/IUCN

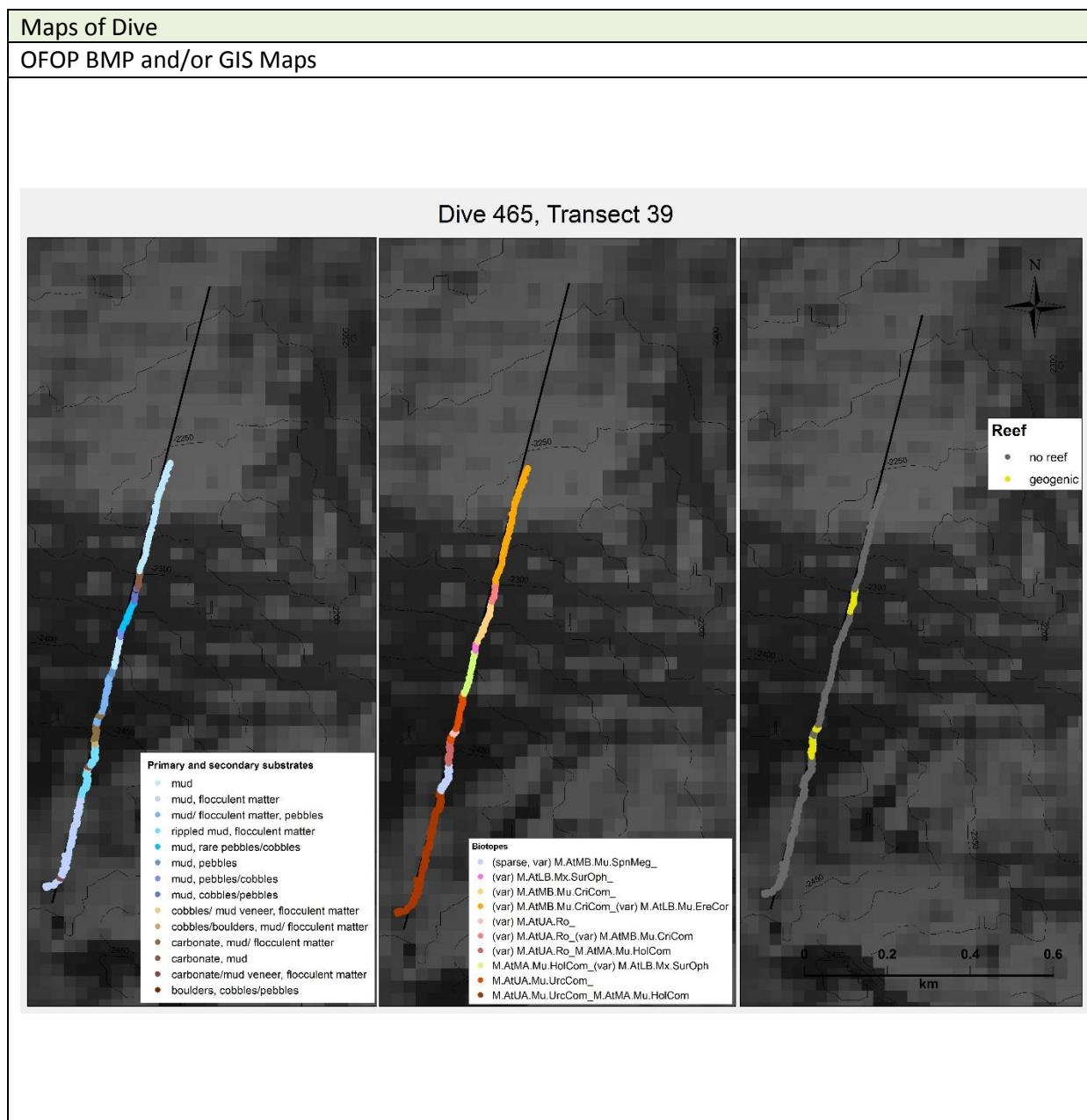
Additional Comments

- This site has more Orange Roughy (*Hoplostethus atlanticus*) in one spot than any other we have seen to date in the Rockall Trough area. This is similar to the aggregations described by Lorance et al (2002) in the Bay of Biscay, with Roughy in various colour states. This area is therefore likely to be important feeding or spawning ground for this species (unknown which).
- Upper slopes host many juvenile Synaphobranchus kaupii eels and *Apristurus sp* sharks. This may be an important fish nursery ground.
- This is at the deeper extent of *L. pertusa*'s depth range, so environmental change may be responsible for areas of dead reef encountered. Extended coral gravel areas may have been trawled at some point to present as such fine grains but no trawl marks are apparent anywhere on the dive.

DIVE SUMMARY	
DIVE #	TRANSECT #
465	39

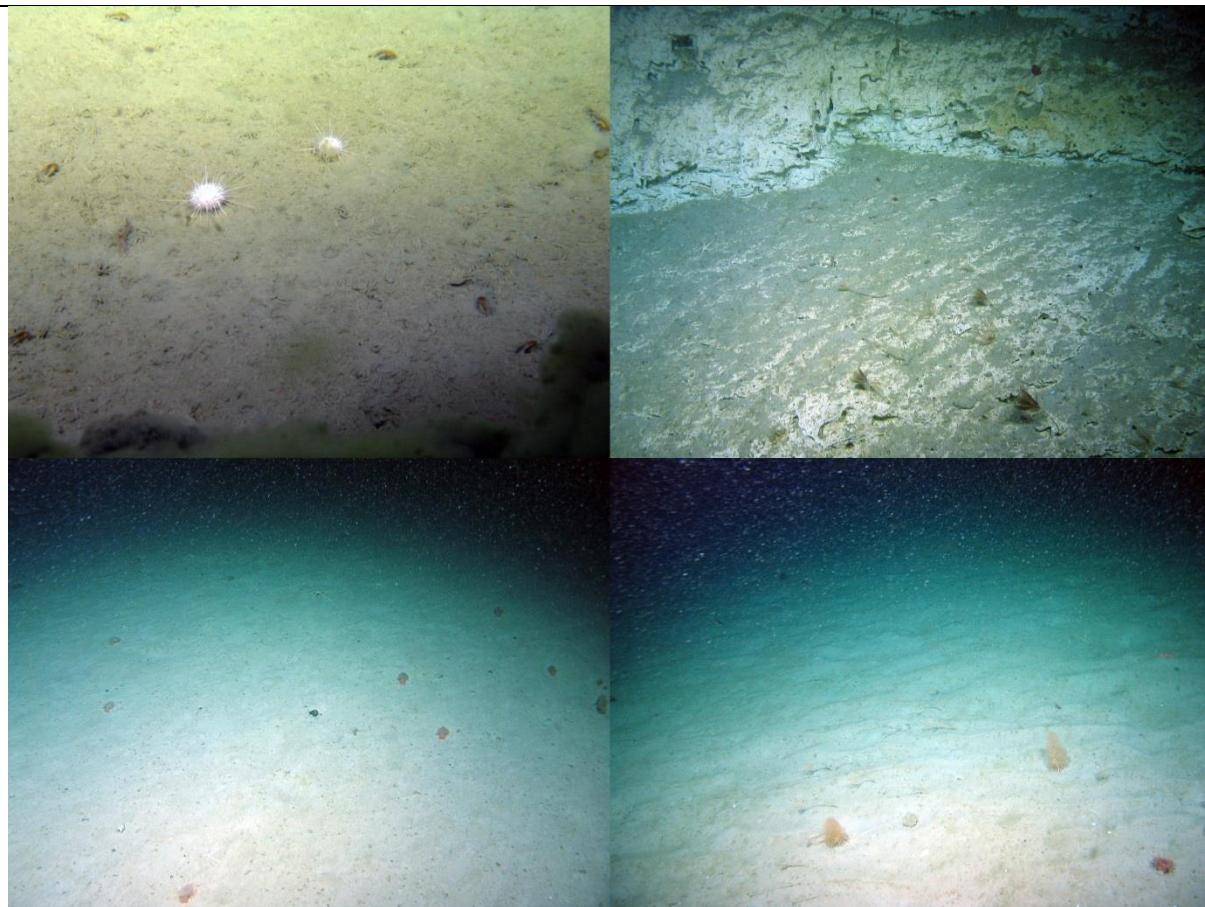
	Start	End
Date & Time	09/07/2017 11:58:38	09/07/2017 13:42:56
Latitude/ Longitude	54.562437, -11.45436883	54.5719103, -11.44871567
Depth	2460.28	2232.28
Images	IMG_4878-IMG_4925.JPG	
Samples	n/a	

Location	C7
Target Features	Canyon, Escarpment
Depth Range	2210.96-2465.6m (av. 2393.525m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Mud and flocculent matter with white echinoids (OTU559) dominated the first part of the dive, with varying densities of juvenile holothurians (*Elpidiidae* sp OTU1116). (M.AtUA.Mu.UrcCom, M.AtMA.Mu.HolCom)

Top R. A couple of areas of sloping/vertical carbonate, with mud/flocculent matter lying on sloping areas. Stalked crinoids are the most abundant fauna here, *cf Porphyrocrinus thalassae* (OTU1045) being most apparent, with *Chrysogorgiidae* sp (OTU1008) corals often also present. Sometimes (like in this image) *Bathyocrinidae/Democrinidae* sp are also present in the mud veneer. ((var) M.AtUA.Ro)

Bottom L. Holothurians (*cf Amperima* sp) were abundant in some areas, co-occurring with *Ophiomuseum lymani*. (M.AtMA.Mu.HolCom, (var) M.AtLB.Mx.SurOph)

Bottom R. *Democrinidae* sp (sediment based stalked crinoids) and *Acanella arbuscula* bamboo corals are particularly abundant at the end of the dive. ((var) M.AtMB.Mu.CriCom, (var) M.AtLB.Mu.EreCor)

Summary Description (habitat transitions noted)			
<p>START OF HD VIDEO 0m/11:58:38 [1] Muddy sediment with flocculent matter and small white echinoids (Echinidae sp, OTU559), marine snow is falling. Patchy aggregations of juvenile holothurians are encountered mosaicked with echinoids. 1m ROV off bottom and moving right. 3m moving forwards. 9-21m stopped for pushcore sampling, although the mud appears to be only ~10cm deep before the ROV lifts (one failed attempt, one successful but not very full). 28-29m out of focus while trying to zoom on juvenile holothurians. 34-38m stopped. 41m mud becomes rippled.</p> <p>47m [2] fauna is sparse but several Distichoptilum gracile are encountered. Some patchy areas of cobbles/mud veneered carbonate are also present but not colonised or of large enough area to qualify as a separate biotope. 53m [3] mud with cobbles/boulders before sloping/vertical carbonate are colonised mainly by stalked crinoids (especially cf <i>Porphyrocrinus thalassae</i> OTU1045) and purple cf <i>Laetmogone sp</i> holothurians are also found on sloping carbonate with mud veneer. 59m [4] white echinoids (OTU559) and <i>Ophiomuseum lymani</i> on mud with pebbles. 1h00m [5] another area of sloping mud/flocculent matter veneered carbonate with cf <i>P. thalassae</i> and cf <i>Laetmogone sp</i>.</p> <p>1h02m [6] again mud with scattered pebbles, white echinoids and <i>O. lymani</i>. 1h08m [7] Holothurians (cf Amperima sp, OTU628) become abundant, co-occurring with <i>O. lymani</i>. 1h09m flocculent matter no longer abundant. 1h10m no more pebbles. 1h15m [8] an area of pebbles/cobbles hosts mainly <i>O. lymani</i> before transitioning to 1h16m [9] mud with rare pebbles/cobbles and sediment dwelling <i>Democrinus sp</i> (OTU1103) stalked crinoid become abundant. 1h21m cobbles/pebbles more consistently present on mud becoming 1h22m a small cobble/boulder field then 1h23m [10] boulders and carbonate with mud surround or veneer, <i>Democrinus sp</i> still abundant where there is mud, along with <i>Bathyocrinidae sp</i> and cf <i>Porphyrocrinus thalassae</i> attached to the hard substrate. Some <i>Chrysogorgiidae sp</i> also present. 1h28m [11] the mud deepens and the <i>Democrinus sp</i> continues with <i>Acanella arbuscula</i> abundant until the END OF TRANSECT AT 1h44m/13:42:56</p>			

Physical Data					
Reef (types can be concurrent)	12% reef	12% geogenic			
		n/a	n/a		
Substrates		<ul style="list-style-type: none"> - boulders - carbonate - cobbles - flocculent matter - mud - pebbles 			
Geomorphology/Features	Canyon Escarpment				
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder field - sloping carbonate - vertical carbonate 				
Pressures	n/a				

Biological Data			
Number of Species	35 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U.	Name	Size/Growth	SACFOR
585	Acanella arbuscula	L	O
554	Actinernus sp	L	R
605	Actiniaria sp 20	M	R
278	Anthomastus grandiflorus	M	R
594	Anthoptilum grandiflorum	L	R
1171	Asteroidea sp (pinkDeepSed)	M	R
1045	Bathycrinidae sp 2 cf Porphyrocrinus	L	O
6	Caryophyllia sp	M	R
584	Caryophyllia sp 5 (bullseye)	M	R
2	Ceriantharia	M	R
1008	Chrysogorgidae sp 1	L	O
1059	Colossendeis sp	L	R
577	Coryphaenoides guentheri	L	O
566	Coryphaenoides rupestris	L	R
131	Crinoidea sp 1	M	O
1103	Democrinus sp	M	F
1108	Distichoptilum gracile	L	O
559	Echinidae sp (white)	M	O
1116	Elpidiidae sp (juv)	S	O
1106	Eucaridea sp	M	R
1144	Galatheoidea sp	M	R
1113	Halosauridae sp	L	R
1154	Henricia sp (deep)	M	R
542	Hippasteria phrygiana	M	R
432	Holothuroidea (cf Laetmogone) (L)	L	O
628	Holothuroidea sp 4 (cf Amperima)	M	O
1110	Hymenaster cf pellucidus	L	O
274	Hymenodiscus coronata/ Brisingena	L	O
1160	Lepidion guentheri	L	O
536	Mesothuria intestinalis	L	R
551	Ophiomuseum lymani	L	R
1167	Peniagone sp	M	R
433	Pseudarchaster sp 1	M	R
1130	Scleractinia sp (mud Butterfly)	M	R
291	Zoarcidae sp 2	L	R

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var) M.AtLB.Mx.SurOph.OphCer	(upper abyssal variant) Ophiomuseum lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
(var) M.AtMB.Mu.CriCom	(upper abyssal stalked variant) Crinoid dominated community on Atlantic mid bathyal mud	Mud and sand emergent fauna (ICES)
(var) M.AtUA.Ro	(Stalked crinoids, sponges, and corals on) Atlantic upper abyssal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory);
M.AtMA.Mu.HolCom	Holothurian dominated community on Atlantic mid abyssal mud	
M.AtUA.Mu.UrcCom	Urchin dominated community on Atlantic upper abyssal mud	
(var) M.AtLB.Mu.EreCor.AcaArb	(upper abyssal variant) Acanella arbuscula assemblage on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)
(sparse, var) M.AtMB.Mu.SpnMeg	(sparse, upper abyssal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtUA.Mu.UrcCom, M.AtMA.Mu.HolCom 559 Echinidae sp (white)	
2	(sparse, var) M.AtMB.Mu.SpnMeg 1108 Distichoptilum gracile	
3	(var) M.AtUA.Ro, M.AtMA.Mu.HolCom 1045 Porphyrocrinus thalassae, 432 holothuroidea (cf Laetmogone) (purple)	
4	M.AtUA.Mu.UrcCom 559 Echinidae sp (white), 551 Ophiomuseum lymani	
5	(var) M.AtUA.Ro 1045 Porphyrocrinus thalassae, 432 holothuroidea (cf Laetmogone) (purple)	
6	M.AtUA.Mu.UrcCom 559 Echinidae sp (white), 551 Ophiomuseum lymani	
7	M.AtMA.Mu.HolCom, (var) M.AtLB.Mx.SurOph.OphCer 628 Holothuroidea sp (cf Amperima), 551 Ophiomuseum lymani	
8	(var) M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
9	(var) M.AtMB.Mu.CriCom 1103 Democrinus sp	

10	(var) M.AtUA.Ro, (var) M.AtMB.Mu.CriCom 1103 Democrinidae sp, 1045 Bathycrinidae sp 2 cf Porphyrocrinus thalassae
11	(var) M.AtMB.Mu.CriCom, (var) M.AtLB.Mu.EreCor.AcaArb 1103 Democrinidae sp, 585 Acanella arbuscula

Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens	ICES/OSPAR ICES subcategory	
- Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	ICES subcategory	
- Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens	OSPAR	
Sea-pen and burrowing megafauna communities	ICES	
Seapen fields	ICES	
Mud and sand emergent fauna	ICES	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - Mostly mud with urchins/holothurians, areas of sloping carbonate with stalked crinoids and Chrysogorgiids 		

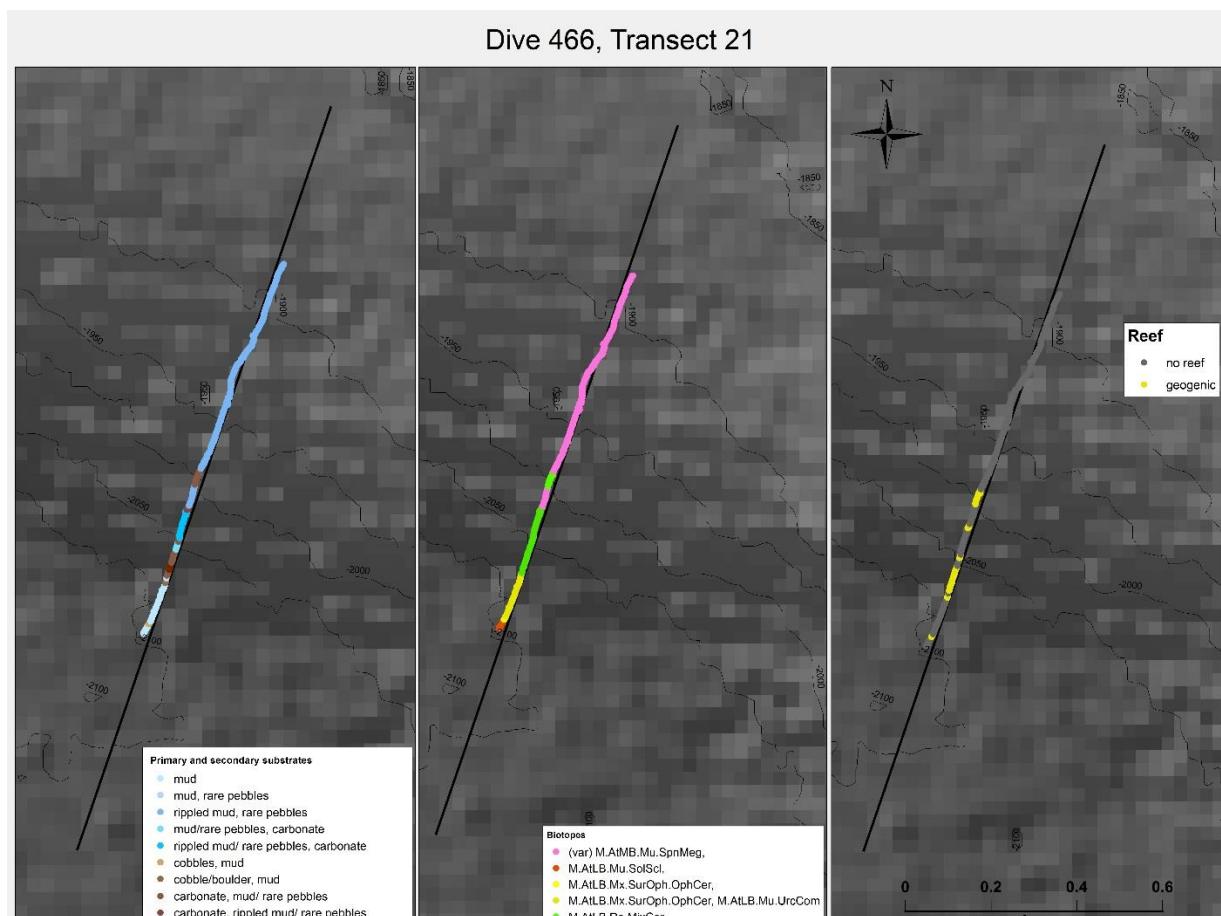
DIVE SUMMARY	
DIVE #	TRANSECT #
466	21

	Start	End
Date & Time	09/07/2017 20:01:25	09/07/2017 21:35:58
Latitude/ Longitude	54.7041795, -10.95277583	54.7113808, -10.94721017
Depth	2092m	1879.56m
Images	IMG_4935-IMG_5395.JPG	
Samples	2 x pushcores	

Location	C6
Target Features	Canyon, Escarpment
Depth Range	1879.23-2092.00m (av. 1974.778m)

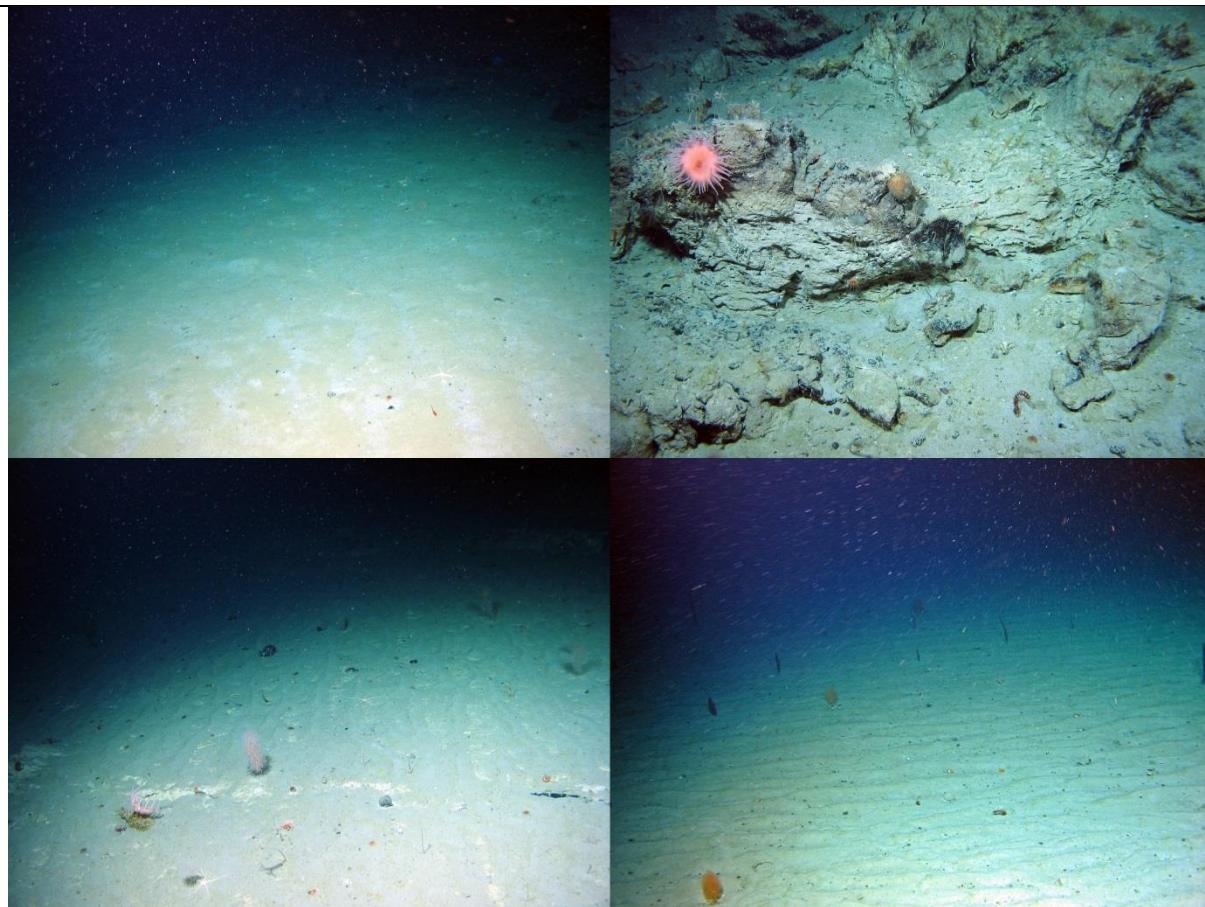
Maps of Dive

OFOP BMP and/or GIS Maps



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. *Ophiomuseum lymani* was consistently present throughout much of the dive often mosaicked over other assemblages, here with solitary cup corals (Caryophyllidae/Flabellidae).
(M.AtLB.Mu.SolScl, M.AtLB.Mx.SurOph.OphCer)

Top R. Carbonate rock with stalked crinoids, corals and sponges. (M.AtLB.Ro.MixCor,)

Bottom L. Carbonate with mud overlay was colonised by mixed corals, especially *Chrysogorgiidae* sp (OTU1008). (M.AtLB.Ro.MixCor,)

Bottom R. Sea pens (*cf Anthoptilum* sp) on rippled mud with many *Acanella arbuscula* also present.
((var) M.AtMB.Mu.SpnMeg)

Summary Description (habitat transitions noted)			
HD VIDEO STARTS 0m/20:01:25 [1] The transect starts on mud with solitary cup corals an <i>Ophiomuseum lymani</i> 3m [2] a brief patch of cobbles and boulders is mainly dominated by <i>O. lymani</i> 4m [3] mud mainly hosting again <i>O. lymani</i> , but patchy white echinoids (OTU559) are also present. 12m [4] the first area of escarpment, sloping carbonate is mainly colonised by stalked crinoids, but also sponges and corals along with other scattered fauna. Some ledges are heavily sand veneered with cobbles and boulders providing the main substrate. Extended flatter carbonate shelves are mud veneered with <i>O. lymani</i> but corals often still present (e.g. <i>Stauropathes arctica</i>) attached to the underlying carbonate. 25-26m stop for imagery (<i>Actinernus sp</i>). 27-29m stopped/moving slow for imagery. 33m [5] rippled mud with rare pebbles, scattered fauna, mainly cf <i>Anthoptilum sp</i> (OTU1107) sea pens. 37m [6] horizontal carbonate with mud veneer, mixed corals attach to the underlying carbonate, especially <i>Chrysogorgiidae sp</i> (OTU1008). <i>Paramuricea sp</i> and <i>Acanella arbuscula</i> are also present along with cup corals, and <i>O. lymani</i> . 39-40m Stopped for imagery. 42m [7] The mud again deepens with cf <i>Anthoptilum sp</i> sea pens dominating, along with <i>A. arbuscula</i> and solitary cup corals. 57m-1h05m Stopped for two pushcore samples. 1h17m-1h19m stopped for imagery. HD VIDEO ENDS 1h34m/21:35:58.			

Physical Data			
Reef (types can be concurrent)	20% Reef	20% geogenic	
		n/a	n/a
Substrates	- boulders - carbonate - cobbles - mud - pebbles - rippled mud		
Geomorphology/Features	Canyon Escarpmment		
Annex 1 Types	- cobble/boulder field - horizontal carbonate - sloping carbonate		
Pressures	n/a		

Biological Data				
Number of Species		61 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U	Name	Size/Growth	SACFOR	
	585 Acanella arbuscula	L	F	
	554 Actinernus sp	L	O	
	582 Actiniaria sp 18 (sun)	L	R	
	605 Actiniaria sp 20	M	R	
	132 Actinostolidae sp 1	L	R	
	1066 Adamsia sp (Paguridae Associated)	M	R	
	1031 Anachalypsirinus nefertiti	L	O	
	278 Anthomastus grandiflorus	M	R	
	1171 Asteroidea sp (pinkDeepSed)	M	R	
	471 Asteronyx loveni	M	R	
	1041 Bathycrinidae sp 1	M	O	
	1045 Bathycrinidae sp 2 cf Porphyrocrinus tha	L	O	
	328 Bathypathes sp 1	L	R	
	1077 Caridea (indet)	M	R	
	6 Caryophyllia sp	M	R	
	1058 Caryophyllidae/Fabellidae (indet)	M	O	
	2 Ceriantharia	M	R	
	1107 cf Anthoptilum sp	L	F	
	984 cf Halcampoididae sp	M	R	
	1174 cf Hymenaster sp (yellow)	L	R	
	1008 Chrysogorgiidae sp 1	L	F	
	303 Coelorhynchus coelorrhynchus	L	R	
	1059 Colossendeis sp	L	R	
	577 Coryphaenoides quenneri	L	O	
	131 Crinoidea sp 1	M	R	
	1108 Distichoptilum gracile	L	O	
	559 Echinidae sp (white)	M	O	
	572 Echinothuroidea sp (whiteDeep)	L	R	
	1052 Echinus sp (deep, white/pink)	M	R	
	1056 Flabellum sp	M	R	
	208 Henricia sanguinolenta	M	R	
	432 Holothuroidea (cf Laetmogone) (purple)	L	O	
	1110 Hymenaster cf pellucidus	M	R	
	274 Hymenodiscus coronata/ Brisinga endac	L	O	
	1172 Macrouridae sp (cf Coelorhynchus)	L	R	
	536 Mesothuria intestinalis	M	R	
	1102 Munnopsidae	M	R	
	551 Ophiomuseum lymani	L	F	
	1076 Ophiuroidea (indet)	S	R	
	205 Paguridae spp	M	R	
	1050 Paramuricea sp	L	O	
	1161 Parantipathes sp (branched)	L	R	
	1042 Parantipathes sp (unbranched)	L	R	
	1046 Pennatula aculeata	L	R	
	255 Phelliactis sp 1	L	O	
	555 Phormosoma placenta	M	R	
	552 Polyacanthonotus rissoanus	L	R	
	1030 Polymastia cf boletiformis	L	R	
	800 Porifera encrusting (blue)	Crust	R	
	1 Porifera encrusting sp 1 (white)	Crust	R	
	30 Porifera encrusting sp 10 (yellow)	Crust	R	
	1151 Porifera lamellate (Hexactinosida)	L	R	
	601 Porifera massive globose sp 11 cf Geod	L	R	
	433 Pseudarchaster sp 1	M	R	
	652 Rajiformes sp 1 poss Neoraja caerulea	L	R	
	573 Solaster endeca	L	R	
	547 Stauropathes arctica	L	O	
	440 Synapobranchus kaupii	L	R	
	261 Syringammina fragilissima	M	R	
	581 Umbellula sp	L	O	
	291 Zoarcidae sp 2	L	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var) M.AtMB.Mu.SpnMeg	(lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
M.AtLB.Mu.SolScl	Solitary scleractinian field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Cup-coral fields (ICES subcategory)
M.AtLB.Mx.SurOph.OphCer	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Mu.UrcCom	Urchin dominated community on Atlantic lower bathyal mud	

Biotope progression per habitat transition (# species, dominant/characteristic species)

1	M.AtLB.Mu.SolScl, M.AtLB.Mx.SurOph.OphCer 1058 Caryophyllidae/Flabellidae (indet), 551 Ophiomusium lymani
2	M.AtLB.Mx.SurOph.OphCer 551 Ophiomusium lymani, 274 Hymenodiscus coronata/Brisinga endacanemos
3	M.AtLB.Mx.SurOph.OphCer, M.AtLB.Mu.UrcCom 551 Ophiomusium lymani, 559 Echinidae sp (white)
4	M.AtLB.Ro.MixCor, M.AtLB.Mx.SurOph.OphCer 1041 Bathycrinidae sp1, 551 Ophiomusium lymani, 547 Stauroptenes arctica
5	(var) M.AtMB.Mu.SpnMeg 1107 cf Anthoptilum sp
6	M.AtLB.Ro.MixCor 1008 Chrysogorgiidae sp
7	(var) M.AtMB.Mu.SpnMeg 1107 cf Anthoptilum sp, 585 Acanella arbuscula, 1058 Caryophyllidae/Flabellidae (indet)

Conservation Targets

Listed Habitats Encountered

Name	Authority
Sea-pen and burrowing megafauna communities	OSPAR
Seapen fields	ICES
Coral gardens	ICES/OSPAR
- Soft-bottom coral garden: Cup-coral fields	ICES subcategory
- Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	ICES subcategory
Listed Species Encountered (Fish, Count)	
n/a	n/a

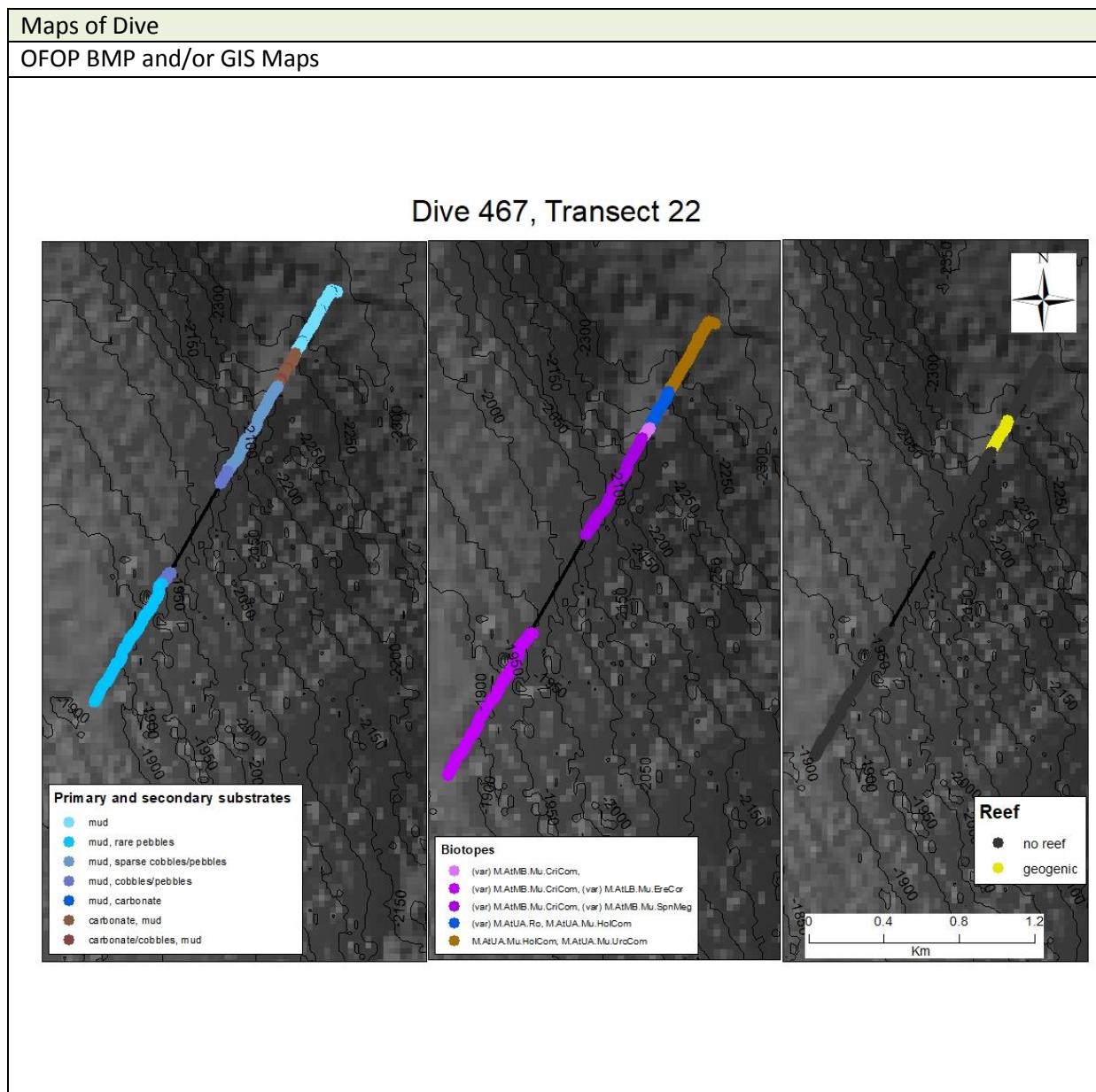
Additional Comments

- Cup corals, then carbonate with stalked crinoids and chrysogorgiids, then acanella/sea pens on rippled sediment

DIVE SUMMARY	
DIVE #	TRANSECT #
467	22

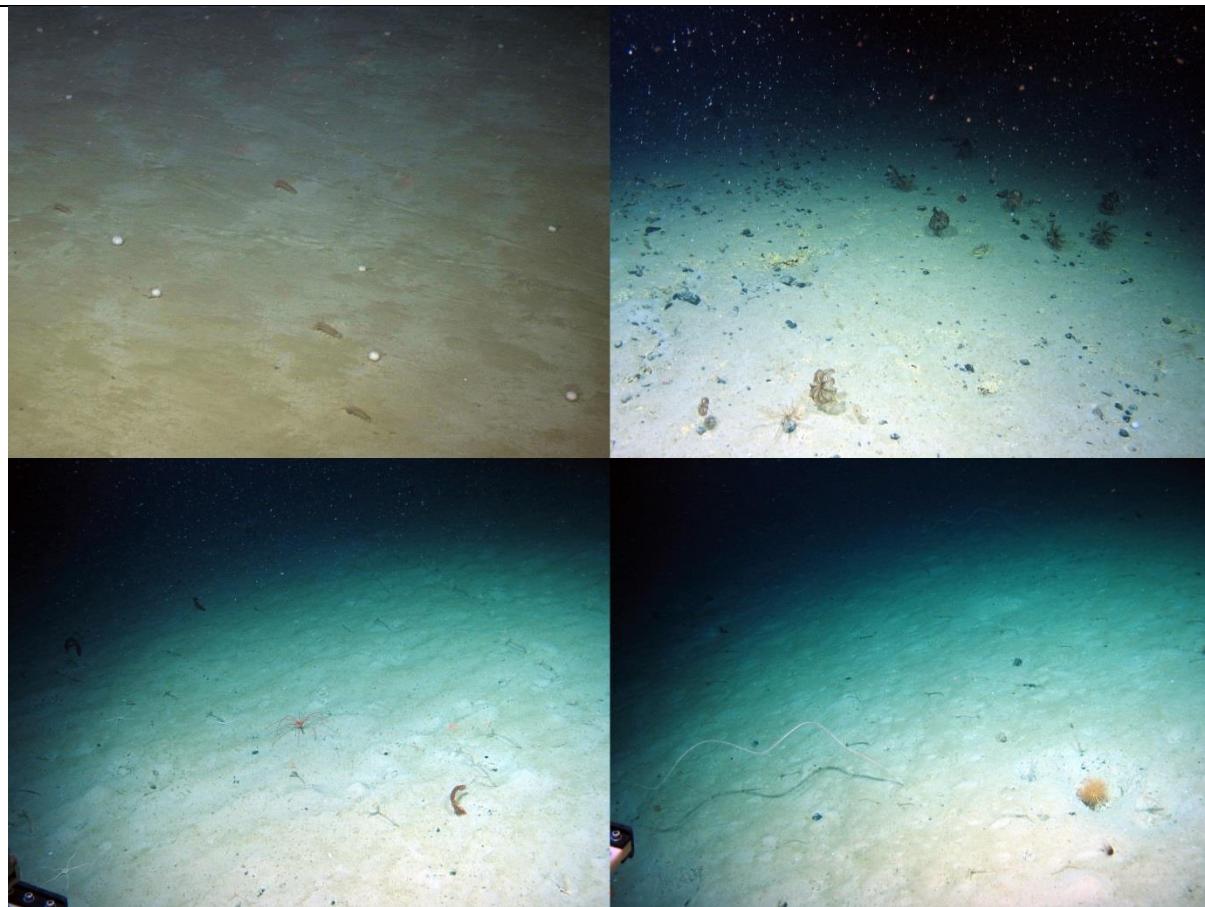
	Start	End
Date & Time	10/07/2017 01:54:54	10/07/2017 05:28:41
Latitude/ Longitude	54.80376867, -10.83368917	54.78555833, -10.8549823
Depth	2292.76	1872.45
Images	IMG_5397-IMG_5460.JPG	
Samples	1 x seapen (<i>Halipteris</i> ?), 2 x pushcores, 1 x chrysogorgiidae, 1 x Radicipes.	

Location	C6
Target Features	Canyon, Escarpment
Depth Range	1872.18-2315.15m (av. 2114.903m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The transect starts on an extended area of mud dominated by *Peniagone* sp holothurians and patchy aggregations of white echinoids (OTU559).

Top R. Several areas of terraced vertical and horizontal carbonate are heavily mud veneered. Areas of exposed or thinly veneered rock host mainly *Bathyocrinidae* sp (OTU1141) but sparse corals (especially *Chrysogorgiidae* sp) and sponges are also present.

Bottom L. The mud slope towards the end of the first half of this dive is heavily colonised by *Democrinus* sp stalked crinoids, co-occurring with cf *Anthoptilum* sp sea pens.

Bottom R. The second half of the dive (upslope from the first by 50mins, and 120m depth after ascent in blue water) continued on mud slope with *Democrinus* sp but erect corals are more frequent than sea pens with increased numbers of *Acanella arbuscula* (Left) and *Radicipes cf gracilis* (right).

Summary Description (habitat transitions noted)			
<p>START OF 1st HD VIDEO (D467_T22_HD_10072017.mov) 0m/01:54:54 [1] The transect starts on mud with holothurians (<i>Peniagone sp</i>) and echinoids (white <i>Echinidae sp</i>, OTU559). 1m ROV moving right. 3m ROV moving forward. 5-6m Stopped for imagery at a barely visible carbonate ledge with plastic attached. 25m [2] areas of protruding carbonate terraced with heavy mud veneer. Stalked crinoids dominate the hard substrate while <i>Peniagone sp</i> continues on the mud. 41-42m stop for imagery. 45m [3] mud with <i>Democrinus sp</i> stalked crinoids and <i>Ophiomuseum lymani</i>, sparse pebbles also present. 51m [4] mud upslope continues with <i>Democrinus sp</i>, but now seapens become abundant (especially cf <i>Anthoptilum sp</i>). 1h08m-1h19m ROV zigzags left/forward several times. 1h21m-1h36m stopped for sampling sea pen and pushcores. 1h44m scattered cobbles and pebbles, some <i>Chrysogorgiidae sp</i> also present. 1h48m stopped to sample <i>Chrysogorgiidae sp</i> until END OF 1st HD VIDEO 1h54m/03:49:36. Blue water transit uphill. START OF 2nd HD VIDEO (D467A_T22_HD_10072017.mov) 0m/04:39:56 [5] Similar to the prior assemblage, with continued upslope mud and scattered cobbles dominated by <i>Democrinus sp</i> stalked crinoids. Now sea pens are sparse and <i>Acanella arbuscula</i> is more abundant with patchy and sometimes abundant <i>Radicipes cf gracilis</i> whip corals. 7m ROV moving left/diagonally left, 9m ROV moving forward. 26-32m stop to sample <i>Radicipes cf gracilis</i>. Continue forward until END OF 2nd HD VIDEO 48m/05:28:41.</p>			

Physical Data			
Reef (types can be concurrent)	12% reef	12% geogenic	
		n/a	n/a
Substrates	<ul style="list-style-type: none"> - carbonate - cobbles - mud - pebbles 		
Geomorphology/Features	Canyon		
	<ul style="list-style-type: none"> - Terraced carbonate 		
Annex 1 Types	<ul style="list-style-type: none"> - horizontal bedrock - vertical bedrock 		
Pressures	<ul style="list-style-type: none"> - 1 x blue plastic 		

Biological Data				
Number of Species		70spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	F	
554	Actinernus sp	L	R	
582	Actiniaria sp 18 (sun)	L	R	
605	Actiniaria sp 20	M	R	
930	Actinopterygii sp 3	M	R	
1066	Adamsia sp (Paguridae Associated)	M	R	
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	R	
1031	Anachalypsicrinus nefertiti	L	O	
278	Anthomastus grandiflorus	M	R	
650	Asconema sp (Porif mass glob 14)	L	R	
1173	Astroidea (cf Ceremaster/Hymenaster, red	M	R	
1186	Astroidea cf Spinulosida	M	R	
1171	Astroidea sp (pinkDeepSed)	M	R	
471	Asteronyx loveni	M	R	
1141	Bathycrinidae sp	L	F	
1041	Bathycrinidae sp 1	M	O	
1045	Bathycrinidae sp 2 cf Porphyrocrinus thalass	L	O	
328	Bathypathes sp 1	L	R	
34	Brachiopoda	S	R	
6	Caryophyllia sp	M	R	
1111	Cataetyx laticeps	L	R	
2	Ceriantharia	M	R	
1069	Ceriantharia sp (giant)	L	R	
1107	cf Anthoptilum sp	L	F	
1129	cf Echinus (deepPinkSpine)	M	R	
984	cf Halcampoididae sp	M	R	
1008	Chrysogorgidae sp 1	L	R	
1059	Colossendeis sp	L	O	
113	Colus sp	M	R	
1105	Coryphaenoides armatus	L	O	
577	Coryphaenoides guentheri	L	O	
1072	Crinoidea sp (10 arm)	L	R	
131	Crinoidea sp 1	M	R	
1103	Democrinus sp	M	F	
559	Echinidae sp (white)	M	F	
572	Echinothuroidea sp (whiteDeep)	L	O	
1056	Flabellum sp	L	O	
1144	Galatheoidea sp	M	R	
1184	Goniasteridae sp	L	O	
622	Halipterus cf finmarchica	L	R	
1113	Halosauridae sp	L	O	
1185	Harriotta haekeli	L	R	
432	Holothuroidea (cf Laetmogone) (purple)	L	R	
1125	Hygrosoma sp	L	R	
1110	Hymenaster cf pellucidus	L	O	
274	Hymenodiscus coronata/ Brisinga endacacr	L	O	
1160	Lepidion guentheri	L	R	
536	Mesothuria intestinalis	M	R	
339	Munida tenuimana	M	R	
1102	Munnopsidae	M	R	
1026	Mysida (indet)	S	R	
1063	Neolithodes grimaldii	L	R	
551	Ophiomuseum lymani	L	O	
205	Paguridae spp	M	R	
1050	Paramuricea sp	L	R	
1167	Peniagone sp	M	F	
1083	Pennatulacea sp (thin)	L	O	
255	Phelliactis sp 1	L	O	
555	Phormosoma placenta	M	R	
552	Polyacanthonotus rissoanus	L	R	
30	Porifera encrusting sp 10 (yellow)	Crust	R	
1132	Porifera lamellate lobose (fleshy)	M	R	
1010	Porifera lamellate sp 12 (solen Assoc)	L	R	
433	Pseudarchaster sp 1	M	R	
1044	Radicipes cf gracilis	L	F	
1134	Scyphozoa sp (indet)	M	R	
547	Staurophathes arctica	L	O	
440	Synaphobranchus kaupii	L	O	
581	Umbellula sp	L	R	
291	Zoarcidae sp 2	L	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
M.AtUA.Mu.HolCom	Holothurian dominated community on Atlantic upper abyssal mud	
M.AtUA.Mu.UrcCom	Urchin dominated community on Atlantic upper abyssal mud	
(var) M.AtUA.Ro	(Stalked crinoids, sponges, and corals on) Atlantic upper abyssal rock and other hard substrata	
(var) M.AtMB.Mu.CriCom	(upper abyssal stalked variant) Crinoid dominated community on Atlantic mid bathyal mud	Mud and sand emergent fauna (ICES)
(var) M.AtMB.Mu.SpnMeg	(upper abyssal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
(var) M.AtLB.Mu.EreCor	(upper abyssal variant) Erect coral field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtUA.Mu.HolCom, M.AtUA.Mu.UrcCom 1167 Peniagone sp, 559 Echinidae sp (white)	
2	(var) M.AtUA.Ro, M.AtUA.Mu.HolCom 1141 Bathycrinidae sp, 1167 Peniagone sp	
3	(var) M.AtMB.Mu.CriCom 1103 Democrinus sp, 551 Ophiomuseum lymani	
4	(var) M.AtMB.Mu.CriCom, (var) M.AtMB.Mu.SpnMeg 1103 Democrinus sp, 1107 cf Anthoptilum sp, 1008 Chrysogorgiidae sp	
5	(var) M.AtMB.Mu.CriCom, (var) M.AtLB.Mu.EreCor 1103 Democrinus sp, 585 Acanella arbuscula, 1044 Radicipes cf gracilis	

Conservation Targets		
Listed Habitats Encountered		
Name Authority		
Mud and sand emergent fauna		ICES
Sea-pen and burrowing megafauna communities		OSPAR
Seapen fields		ICES
Coral gardens		ICES/OSPAR
- Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens		ICES subcategory
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments

- *Radicipes cf gracilis* (looks like a sea pen but is a Chrysogorgiid) forms habitats in Norway, Iceland, and Canada, is one of the few (non-seapen) corals that anchors in sediment, and is rarely seen in the Rockall Trough region_(to my knowledge at least). See Buhl-Mortensen et al (2014). The species is definitely encountered in at least one other dive in similar abundance (see T23). These are important new records for this species.
- This transect is split into 2 halves pulling off bottom after the first half and transiting through blue water to the higher slope before starting the second half 50mins later.

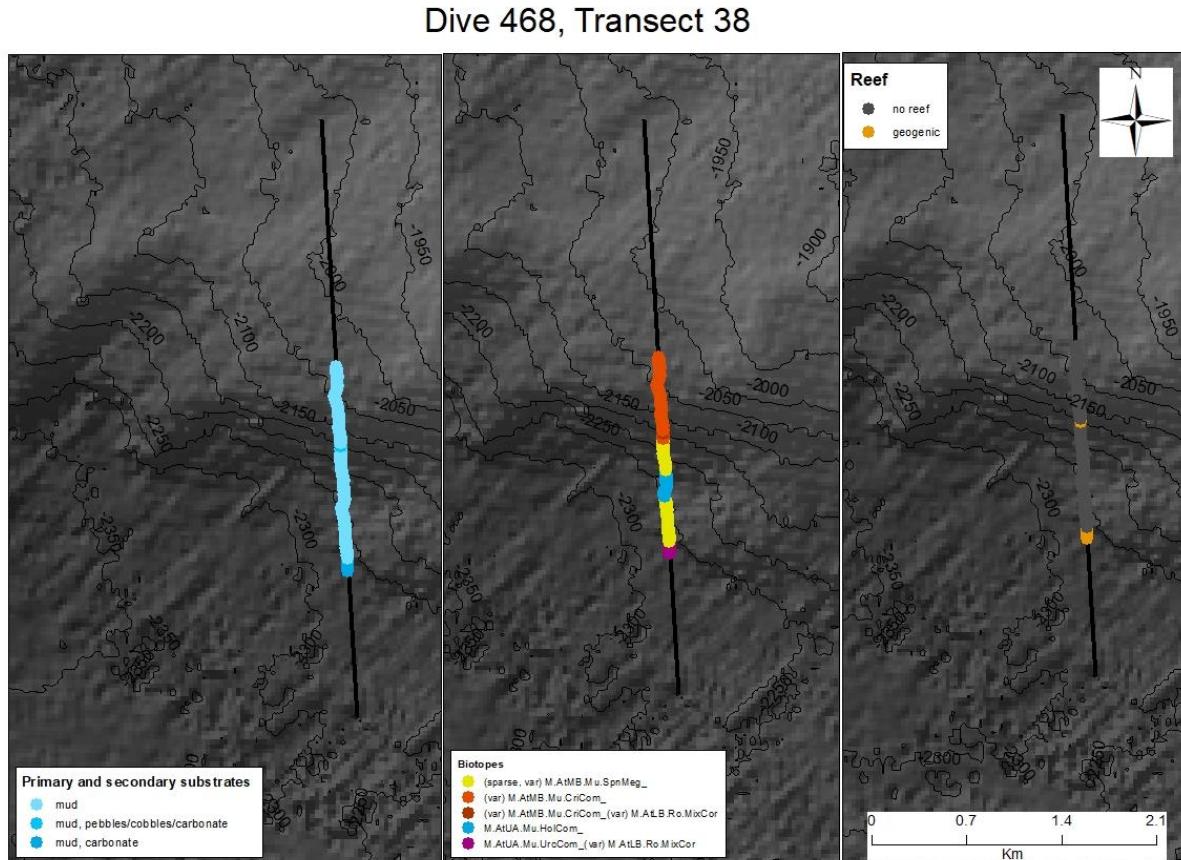
DIVE SUMMARY	
DIVE #	TRANSECT #
468	38

	Start	End
Date & Time	10/07/2017 10:37:54	10/07/2017 12:18:27
Latitude/ Longitude	54.859098, -10.7815285	54.87181783, -10.7814248
Depth	2248.34	2008.91
Images	IMG_5462-IMG_5495.JPG	
Samples	2 x pushcores	

Location	C6
Target Features	Canyon, Escarpment
Depth Range	1913.398-2247.215m (av. 2148.015m)

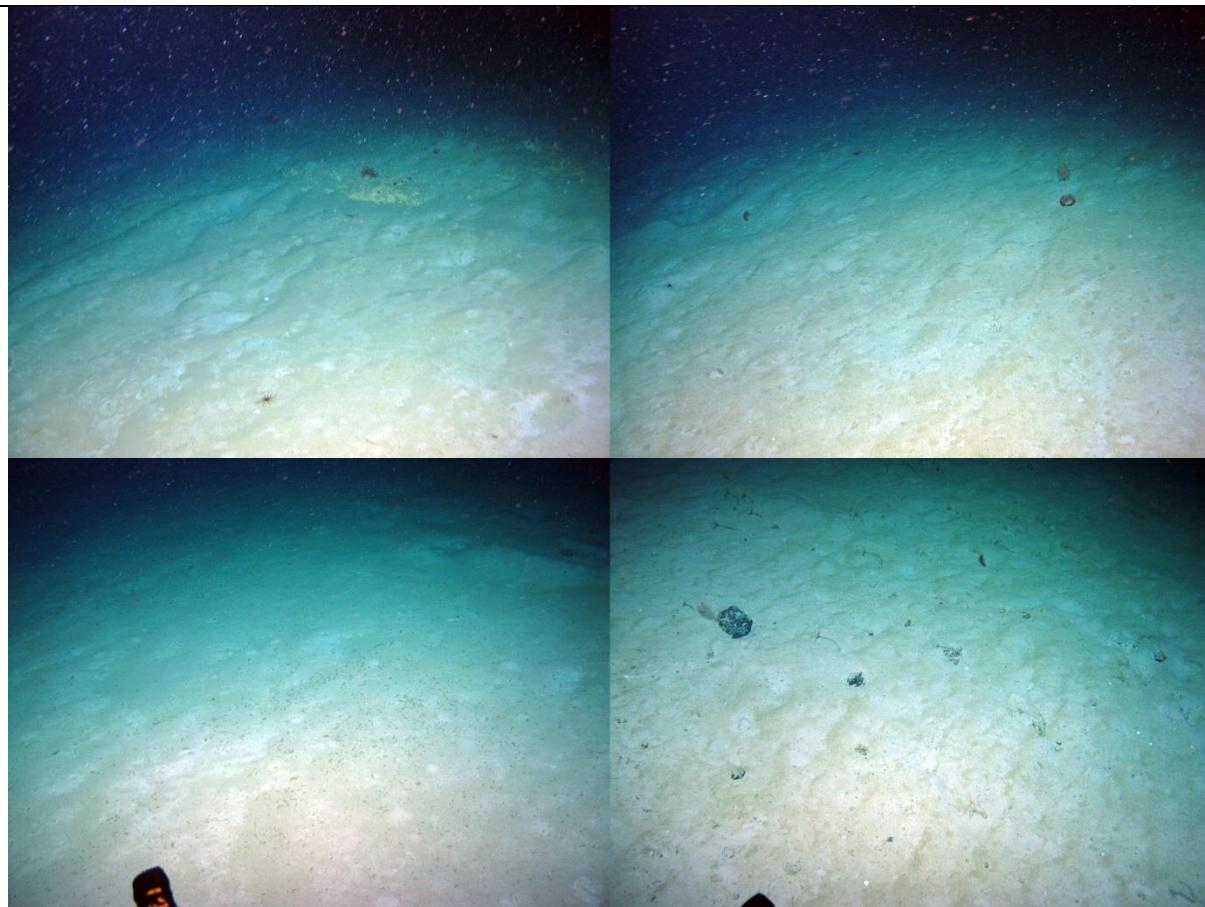
Maps of Dive

OFOP BMP and/or GIS Maps



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The start of the transect encountered white Echinoids (OTU559) on mud with sections of horizontal carbonate emerging through, predominantly colonised by *Anthomastus grandiflorus*. (M.AtUA.Mu.UrcCom, (var) M.AtLB.Ro.MixCor)

Top R. Sometimes the mud was sparsely populated, mainly by sea pens (*cf Anthoptilum sp*). Although not dominant, *Acanella arbuscula* was also frequently encountered. ((sparse, var) M.AtMB.Mu.SpnMeg)

Bottom L. An aggregation of juvenile holothurians extends over a large area of the transect, however they are so small it is hard to delineate the start and end points of the aggregation. (M.AtUA.Mu.HolCom)

Bottom R. Democrinus sp stalked crinoids dominated the latter part of the dive, mostly on mud-only areas, but also for a short period co-occurring with scattered cobbles and pebbles hosting mixed corals, especially *Chrysogorgiidae sp*. ((var) M.AtMB.Mu.CriCom, (var) M.AtLB.Ro.MixCor)

Summary Description (habitat transitions noted)

START OF HD VIDEO AT 0m/10:37:54 Muddy substrate dominated the dive, here colonised by white echinoids (OTU559) and mosaicked with areas of exposed horizontal carbonate colonised by *Anthomastus grandiflorus*. **5m [2]** now exclusively muddy substrate, epifauna are sparse but dominated by sea pens (*cf Anthoptilum sp*) with rare *Radicipes cf gracilis*. 24m moving slowly (pull from the ship) and start heading diagonally right. **27m [3]** although hard to make out due to their small size, periodic close up views reveal an aggregation of juvenile holothurians, likely from the family Elpidiidae. **41m [4]** return to sparse seapens as the dominant epifauna and start moving upslope. 48-56m stop to take two pushcores. **1h03m [5]** Stalked crinoids (*Democrinus sp*) start to become abundant and dominate the landscape. **1h06m [6]** continued *Democrinus sp* on mud, but an area of scattered pebbles and cobbles host *Chrysogorgiid sp* corals. **1h07m [7]** back to mud, with occasional holes (possibly in the underlying carbonate rather than burrows) with *Democrinus sp*.
END OF HD VIDEO AT 1h40m/12:18:27.

Physical Data			
Reef (types can be concurrent)	7% reef	7% geogenic	
		n/a	n/a
Substrates	- mud - carbonate - cobbles - pebbles		
Geomorphology/Features	Canyon		
Annex 1 Types	- cobble/boulder field - horizontal carbonate		
Pressures	- 1 x fishing net - 1 x white plastic		

Biological Data				
Number of Species		44 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	F	
554	Actinernus sp	L	R	
605	Actiniaria sp 20	M	R	
930	Actinopterygii sp 3	M	R	
1066	Adamsia sp (Paguridae Associated)	M	R	
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	R	
278	Anthomastus grandiflorus	M	O	
568	Apristurus cf microps	L	R	
1112	Bathysaurus ferox	L	R	
1058	Caryophyllidae/Fabellidae (indet)	M	R	
1111	Cataetyx laticeps	L	R	
2	Ceriantharia	M	R	
1069	Ceriantharia sp (giant)	L	R	
1107	cf Anthoptilum sp	L	F	
984	cf Halcampoididae sp	M	R	
1008	Chrysogorgidae sp 1	L	F	
1059	Colossendeis sp	L	O	
1105	Coryphaenoides armatus	L	O	
577	Coryphaenoides guentheri	L	O	
1103	Democrinus sp	M	O	
194	Echinidae sp (pink)	M	R	
559	Echinidae sp (white)	M	O	
1116	Elpidiidae sp (juv)	S	O	
1056	Flabellum sp	M	R	
622	Halipterus cf finmarchica	L	R	
274	Hymenodiscus coronata/ Brisinga endacastrensis	L	R	
1160	Lepidion guentheri	L	O	
1102	Munnopsidae	M	R	
551	Ophiomuseum lymani	L	F	
918	Opisthotethis extensa	L	R	
1167	Peniagone sp	M	R	
1083	Pennatulacea sp (thin)	L	F	
255	Phelliactis sp 1	L	O	
555	Phormosoma placenta	M	R	
552	Polyacanthonotus rissoanus	L	O	
1132	Porifera lamellate lobose (fleshy)	L	R	
433	Pseudarchaster sp 1	M	R	
1115	Pterasteridae sp	L	O	
1044	Radicipes cf gracilis	L	R	
652	Rajiformes sp 1 poss Neoraja caerulea	L	R	
1134	Scyphozoa sp (indet)	M	R	
569	Squaliformes (Etmopteridae?)	L	R	
440	Synaphobranchus kaupii	L	R	
291	Zoarcidae sp 2	L	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(sparse, var) M.AtMB.Mu.SpnMeg	(sparse, upper abyssal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	(sparse) Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
(var) M.AtMB.Mu.CriCom	(upper abyssal stalked variant) Crinoid dominated community on Atlantic mid bathyal mud	Mud and sand emergent fauna (ICES)

M.AtUA.Mu.HolCom	Holothurian dominated community on Atlantic upper abyssal mud	
M.AtUA.Mu.UrcCom	Urchin dominated community on Atlantic upper abyssal mud	
(var) M.AtLB.Ro.MixCor	(upper abyssal variant) Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtUA.Mu.UrcCom, (var) M.AtLB.Ro.MixCor 278 <i>Anthomastus grandiflorus</i> , 559 <i>Echinidae</i> sp (white)	
2	(sparse, var) M.AtMB.Mu.SpnMeg 1107 cf <i>Anthoptilum</i> sp	
3	M.AtUA.Mu.HolCom 1116 <i>Elpidiidae</i> (indet)	
4	(sparse, var) M.AtMB.Mu.SpnMeg 1107 cf <i>Anthoptilum</i> sp	
5	(var) M.AtMB.Mu.CriCom 1103 <i>Democrinus</i> sp	
6	(var) M.AtMB.Mu.CriCom, (var) M.AtLB.Ro.MixCor 1104 <i>Democrinus</i> sp, 1008 <i>Chrysogorgiidae</i> sp	
7	(var) M.AtMB.Mu.CriCom 1104 <i>Democrinus</i> sp	

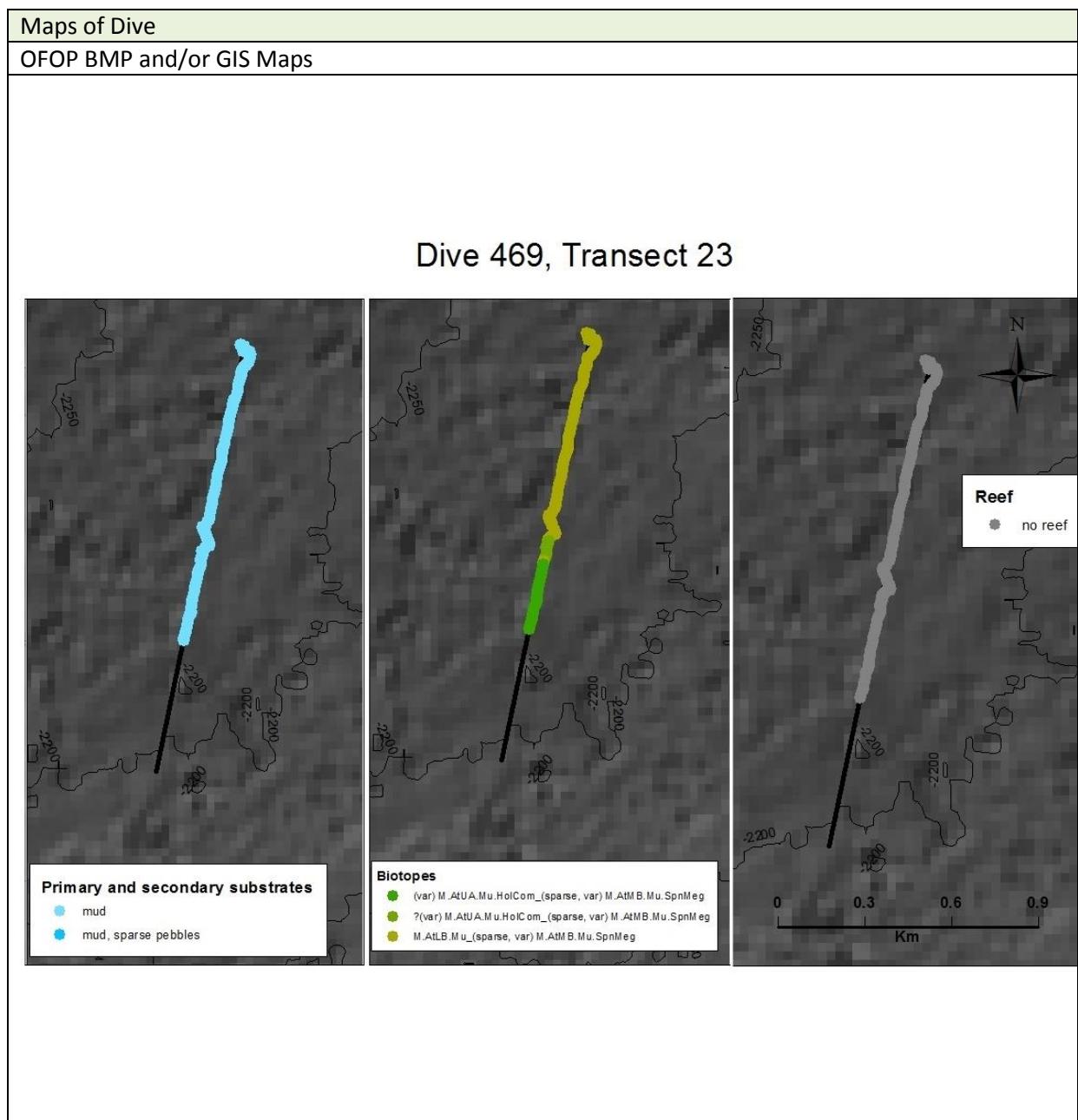
Conservation Targets	
Listed Habitats Encountered	
Name	Authority
Mud and sand emergent fauna	ICES
(sparse) Sea-pen and burrowing megafauna communities	OSPAR
(sparse) Seapen fields	ICES
Coral gardens	ICES/OSPAR
- Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	ICES subcategory
Listed Species Encountered (Fish, Count)	

Additional Comments		
<ul style="list-style-type: none"> - Sparse epifauna on mud, juvenile holothurian aggregations, small carbonate/cobble patches with corals 		

DIVE SUMMARY	
DIVE #	TRANSECT #

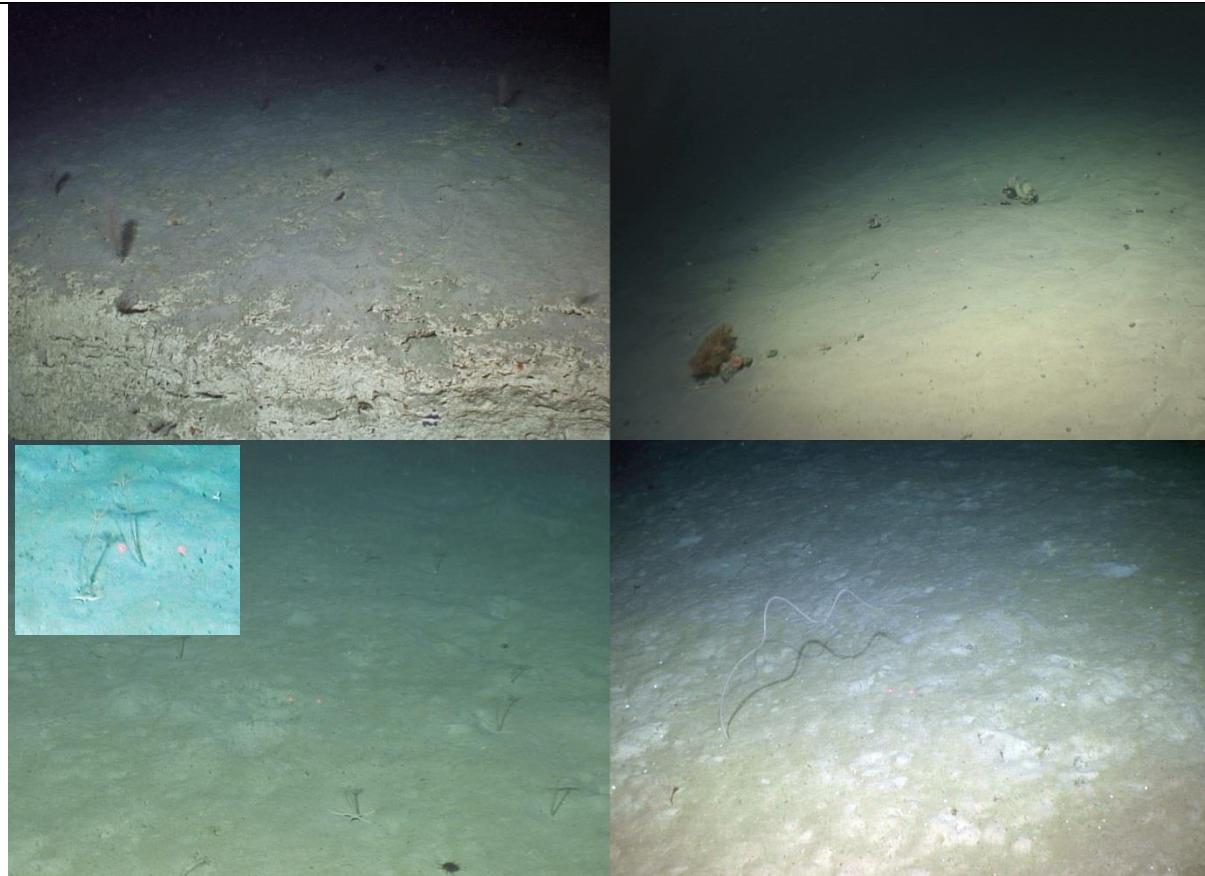
	Start	End
Date & Time	10/07/2017 16:06:25	10/07/2017 18:05:18
Latitude/ Longitude	54.93291, -10.70132333	54.94968817, -10.69223083
Depth	2070.86	1817.26
Images	IMG_5496-IMG_5543	
Samples	2 pushcores	

Location	C5
Target Features	Canyon, (Escarpment)
Depth Range	1813.33-2082.81m (av. 1961.17m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Example of one of the carbonate steps, this one just under 1m high. Chrysogorgiids and mixed corals can be seen on the flat carbonate shelf above. This flat carbonate with mud veneer was the most common habitat for this assemblage. (M.AtLB.Ro.MixCor)

Top R. Occasionally mixed corals were hosted by sparse pebbles and cobbles on mud. (M.AtLB.Ro.MixCor)

Bottom L. The dominant assemblage consisted of (probably) *Democrinus* sp stalked crinoids, and *Ophiomuseum lymani* ophiuroids on burrowed mud. ((var) M.AtMB.Mu.CriCom, (var)M.AtLB.Mx.SurOph.OphCer)

Bottom R. *Radicipes cf gracilis* is a chrysogorgiid “pig tail coral”. It was encountered multiple times and was the dominant species at one point on this dive. They have not previously been recorded in UK/Irish waters (to my knowledge). (M.AtLB.Mu.EreCor, (var) M.AtMB.Mu.CriCom)

Summary Description (habitat transitions noted)

HD VIDEO START 0m/16:06pm [1]: The transect starts on a relatively bioturbated gently upsloping mud bottom. Stalked crinoids (probably cf *Democrinus* sp OTU1103 which anchors in mud) protrude from the sediment and *Ophiomusium lymani* is frequently encountered, along with occasional other fauna. After a sparse patch of pebbles **13m [2]:** the crinoids are no longer seen and *O. lymani* dominates, including through another brief patch of sparse pebbles. **17m [3]:** A dense patch of *Gracilechinus acutus norvegicus* urchins is encountered then at **20m [4]:** back to *O. lymani*. **21m [5]:** carbonate rock is visible beneath the mud hosting mixed corals, transitioning back to **22m [6]:** *O. lymani* on deeper bioturbated mud. **23m [7]:** another *G. acutus norvegicus* patch. **23m [8]:** flat carbonate is again visible beneath the mud veneer hosting mixed corals dominated by *Chrysogorgiidae* sp (OTU1008). This transitions to a carbonate step (c 50cm high), with denser corals, still Chrysogorgiidae dominating, but antipatharians, anemones, sea pens, and echinoderms (especially brisingids, stalked crinoids). The ROV traverses left along it until it shallows, before returning right and moving forward and past it over flat carbonate with mud veneer before it deepens at **27m [9]:** cf *Democrinus* sp and *O. lymani* on bioturbated mud. **29m [10]:** again flat then stepped/terraced carbonate with mixed corals, especially *Chrysogorgiidae* sp, and a heavy mud veneer. Each step is no more than 1m high, the ROV a couple of times traverses along before proceeding over a step. The flat carbonate appears more diverse than the vertical faces here. The last terrace with mud veneer also hosts black cobbles/pebbles and one flat black boulder (resembling tarmac) with pale carbonate visible beneath. **40m [11]:** the mud deepens and cf *Democrinus* dominates with *O. lymani*. **45m [12]:** while this assemblage continues the species most apparent becomes the pigtail coral *Radicipes cf gracilis* (OTU1044), encountering one every couple of metres (see note above). **49m [13]:** returned to cf *Democrinus* sp/*O. lymani* although at **1h2m [14]:** dominance is less apparent amongst other sparse epifauna encountered (holothurians, urchins etc). Burrows here are dominant with cf *Democrinus* sp being marginally more abundant than other species. **1h7m [15]:** sparse pebbles and cobbles on mud again host mixed corals as before but Caryophyllid cup corals (OTU6) are the most abundant species, together with cf *Democrinus* sp in the mud. **1h9m [16]:** the pebbles end, returning to bioturbated mud and cf *Democrinus* sp, although a few *Radicipes cf gracilis* are again encountered. **1h14m [17]:** Again the burrows are dominant and a couple of Eucarid shrimp encountered (OTU1106) assumed to be the burrowers, with *Phormosoma placenta* being the dominant visible epifauna among other species. **1h15m [18]:** cf *Democinus* sp return, with frequent *P. placenta* **1h29** stopped to sample 2 pushcores before continuing until **1h46 [19]:** sparse pebbles and cobbles again host a mixed coral and sponge assemblage with no clear dominant species while cf *Democrinus* sp dominates the intermediate mud. **1h47m [20]:** cf *Democrinus* sp and *Phormosoma placenta* on burrowed mud, **1h51 [21]:** sparse patchy pebbles on mud with *P. placenta* and sparse mixed corals. At 1h51a steep downhill becomes visible off to the left, and the ROV proceeds over and down with this assemblage continued until **HD VIDEO END at 1h58/18:05pm.**

Physical Data			
Reef (types can be concurrent)	9% reef	9% geogenic	
		n/a	n/a
		n/a	n/a
Substrates	<ul style="list-style-type: none"> - carbonate - (sparse) cobbles - mud - (sparse) pebbles 		
Geomorphology/Features	<ul style="list-style-type: none"> - Canyon mud slope <ul style="list-style-type: none"> o mud slope o steep downhill mudslope - Terraced carbonate <ul style="list-style-type: none"> o carbonate crack o carbonate step o flat bedrock o flat boulder o mud veneer 		
Annex 1 Types	<ul style="list-style-type: none"> - cobble field - flat bedrock - vertical rock wall 		
Pressures	<ul style="list-style-type: none"> - 7 x plastic litter 		

Biological Data				
Number of Species		60spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	O	
554	Actinernus sp	L	O	
605	Actiniaria sp 20	M	R	
930	Actinopterygii sp 3	M	R	
132	Actinostolidae sp 1	L	R	
1066	Adamsia sp (Paguridae Associated)	M	R	
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	R	
278	Anthomastus grandiflorus	M	O	
188	Araeosoma fenestratum	L	O	
471	Asteronyx loveni	M	R	
1045	Bathycrinidae sp 2 cf Porphyrocrinus thalassae	L	O	
235	Bathynectes sp	L	R	
432	Benthogone sp	L	O	
6	Caryophyllia sp	M	O	
584	Caryophyllia sp 5 (bullseye)	M	R	
1111	Cataetyx laticeps	L	O	
2	Ceriantharia	M	O	
1107	cf Anthoptilum sp	L	O	
984	cf Halcampoididae sp	M	O	
1008	Chrysogorgidae sp 1	L	F	
113	Colus sp	M	R	
1105	Coryphaenoides armatus	L	R	
577	Coryphaenoides guentheri	L	O	
1103	Democrinus sp	M	C	
1108	Distichoptilum gracile	L	R	
572	Echinoidea sp 5 (Echinothuroidea)	L	R	
1104	Echiura sp	L	O	
1018	Epigonus telescopus	L	R	
317	Epizoanthus sp 1 (Paguridae Associated)	M	R	
1106	Eucaridea sp	M	R	
1056	Flabellum sp	M	R	
559	Gracilechinus acutus norvegicus	M	F	
574	Holothuroidea sp 2	L	R	
628	Holothuroidea sp 4	M	R	
1110	Hymenaster sp	M	R	
274	Hymenodiscus coronata/ Brisinga endacanemo	L	O	
349	Mora moro	L	R	
1102	Munnopsidae	M	R	
551	Ophiomuseum lymani	L	F	
1076	Ophiuroidea (indet)	S	R	
918	Opisthoteuthis extensa	M	R	
205	Paguridae spp	M	R	
1050	Paramuricea sp	L	O	
255	Phelliactis sp 1	L	R	
555	Phormosoma placenta	M	O	
552	Polyacanthonotus rissoanus	L	O	
800	Porifera encrusting (blue)	Crust	R	
30	Porifera encrusting sp 10 (yellow)	Crust	R	
422	Porifera lamellate sp 7	L	O	
576	Porifera massive lobose sp 18(cf Farrea sp)	L	F	
380	Porifera tubular (cf Asconema foliatum)	L	O	
433	Pseudarchaster sp 1	M	R	
1044	Radicipes cf gracilis	L	F	
569	Squaliformes sp	L	O	
547	Stauropathes arctica	L	O	
198	Stichastrella rosea	M	R	
440	Synaphobranchus kaupii	L	O	
581	Umbellula sp	L	O	
259	Zoarcidae sp 1	M	R	
291	Zoarcidae sp 2	L	O	

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var nov) M.AtLB.Mu(.BurMeg)	(suggested temporary new variant) Atlantic lower bathyal mud (with burrowing megafauna)	
M.AtLB.Mu.EreCor	Erect coral field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Mu.UrcCom	Urchin dominated community on Atlantic lower bathyal mud	
M.AtLB.Mu.UrcCom.GraAc u	Gracilechinus acutus norvegicus assemblage on Atlantic lower bathyal mud	
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
(var) M.AtMB.Mu.CriCom	(lower bathyal stalked variant) Crinoid dominated community on Atlantic mid bathyal mud	Mud and sand emergent fauna (ICES)
(var) M.AtLB.Mx.SurOph.OphCer	(variant with very few cerianthids, mostly mud) Ophiomuseum lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtMB.Mu.CriCom, (var)M.AtLB.Mx.SurOph.OphCer 1103 Democrinus sp, 551 Ophiomuseum lymani	
2	(var)M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
3	M.AtLB.Mu.UrcCom.GraAcu 559 Gracilechinus acutus novegicus	
4	(var)M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
5	(var)M.AtLB.Mx.SurOph.OphCer, M.AtLB.Ro.MixCor 551 Ophiomuseum lymani, 605 Actiniaria sp 20	
6	(var)M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
7	M.AtLB.Mu.UrcCom.GraAcu 559 Gracilechinus acutus novegicus	
8	M.AtLB.Ro.MixCor, (var)M.AtLB.Mx.SurOph.OphCer	

	1008 Chrysogorgiidae sp, 551 Ophiomuseum lymani
9	(var) M.AtMB.Mu.CriCom, (var)M.AtLB.Mx.SurOph.OphCer 1103 Democrinus sp, 551 Ophiomuseum lymani
10	(var)M.AtLB.Mx.SurOph.OphCer, M.AtLB.Ro.MixCor 551 Ophiomuseum lymani, 1008 Chrysogorgiidae sp
11	(var) M.AtMB.Mu.CriCom, (var)M.AtLB.Mx.SurOph.OphCer 1103 Democrinus sp, 551 Ophiomuseum lymani
12	M.AtLB.Mu.EreCor, (var) M.AtMB.Mu.CriCom 1044 Radicipes sp, 1103 Democrinus sp, 551 Ophiomuseum lymani
13	(var) M.AtMB.Mu.CriCom, (var)M.AtLB.Mx.SurOph.OphCer 1103 Democrinus sp, 551 Ophiomuseum lymani
14	M.AtLB.Mu(.BurMeg), (sparse, var) M.AtMB.Mu.CriCom 1103 Democrinus sp
15	(var) M.AtMB.Mu.CriCom, M.AtLB.Ro.MixCor 1103 Democrinus sp, 6 Caryophyllia sp
16	(var) M.AtMB.Mu.CriCom, M.AtLB.Mu.EreCor 1103 Democrinus sp, 1044 Radicipes sp
17	M.AtLB.Mu(.BurMeg), M.AtLB.Mu.UrcCom 1106 Eucaridea?, 555 Phormosoma placenta
18	(var) M.AtMB.Mu.CriCom, M.AtLB.Mu.UrcCom 1103 Democrinus sp., 555 Phormosoma placenta
19	M.AtLB.Ro.MixCor, (var) M.AtMB.Mu.CriCom 1103 Democrinus sp.
20	(var) M.AtMB.Mu.CriCom, M.AtLB.Mu.UrcCom 1103 Democrinus sp., 555 Phormosoma placenta
21	M.AtLB.Mu.UrcCom, (sparse) M.AtLB.Ro.MixCor 555 Phormosoma placenta, 2 Ceriantharia sp

Conservation Targets		
Listed Habitats Encountered		
Name		Authority
<ul style="list-style-type: none"> - Mud and sand emergent fauna - Coral gardens <ul style="list-style-type: none"> o Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens o Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens 		ICES ICES/ OSPAR ICES subcategory ICES subcategory
Listed Species Encountered (Fish, Count)		n/a
n/a		n/a

Additional Comments		
<ul style="list-style-type: none"> - <i>Radicipes cf gracilis</i> is encountered as a dominant species in an assemblage, similar to T22. These are important records as this species was not previously recorded in the region. - It is worth noting that this whole transect is dominated by bioturbated mud with many burrows (possibly made by a large Eucarid shrimp (OTU1106), white <i>Gracilechinus acutus norvegicus</i> urchin tests (dead) are also frequently encountered. 		

DIVE SUMMARY			
DIVE #	470	TRANSECT #	24

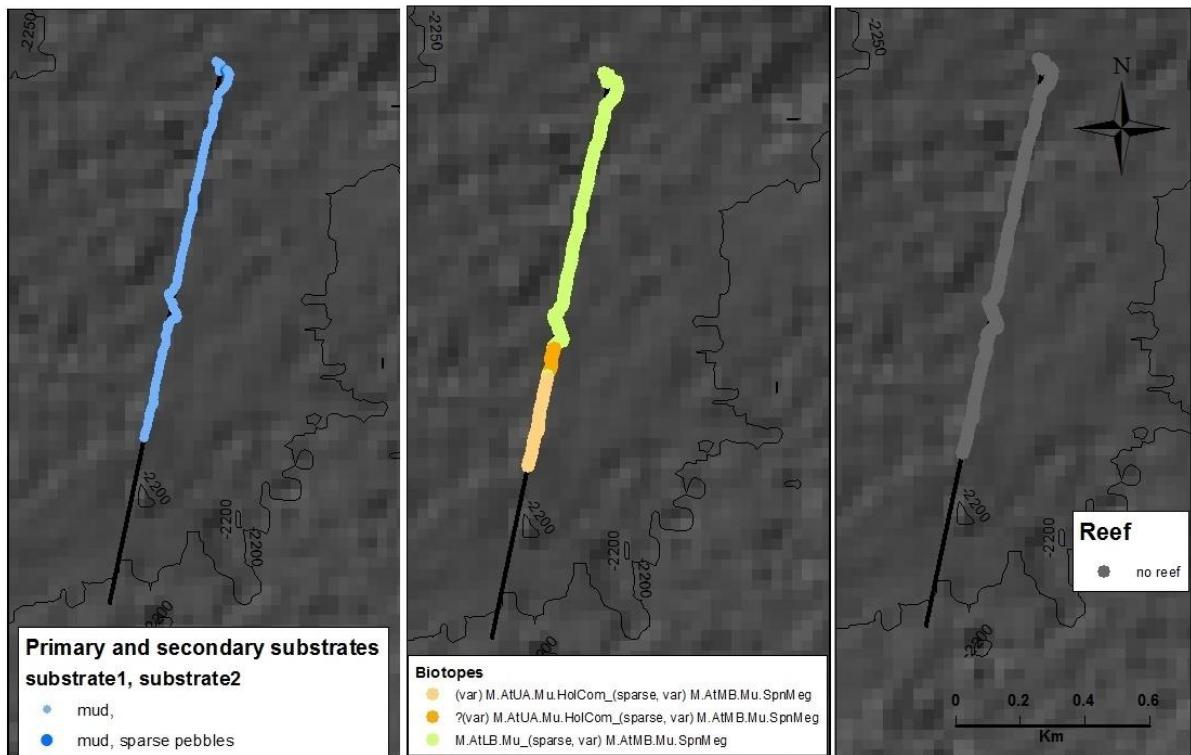
	Start	End
Date & Time	10/07/2017 22:37:36	11/07/2017 00:00:38
Latitude/ Longitude	55.04355, -10.6412	55.0333105, -10.64606867
Depth	2214.57	2201.79
Images	IMG_5545-IMG_5582	
Samples	n/a	

Location	C4
Target Features	Canyon
Depth Range	2201.63-2214.57 (Av. 2208.114m)

Maps of Dive

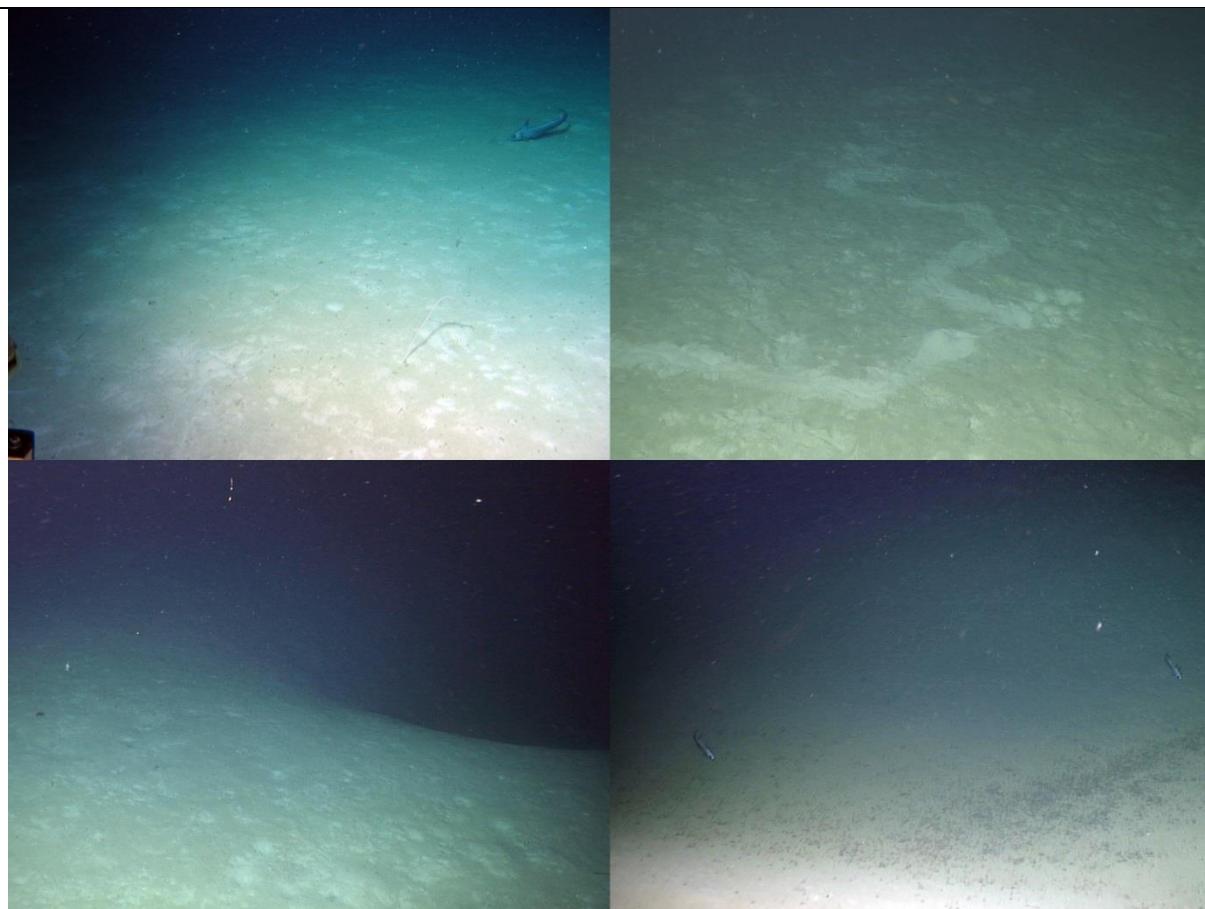
OFOB BMP and/or GIS Maps

Dive 470, Transect 37



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. *Distichoptilum gracile* on a muddy landscape. There is probably one seapen every 50-100m throughout the dive, reaching a maximum density of approx 1 every 20m at the end of the dive. Other species of seapend are also present (e.g. *Umbellula sp*), although often unidentifiable as the ROV does not stop to look at them. ((sparse, lower bathyal variant) M.AtMB.Mu.SpnMeg).

Top R. Example of the types of bioturbation that are apparent, here probably an Echinoid track. But epifauna are very infrequently encountered. (M.AtLB.Mu)

Bottom L. Example of one of the larger depressions interpreted as canyon tributary axes. These are always heavily mud veneered, with finer mud grains in the depressions. (M.AtLB.Mu)

Bottom R. The stripe of juvenile holothurians (*Elpidiidae sp*) with a couple of grenadiers (*Coryphaenoides guentheri*) which were one of the most frequently encountered fauna. ((Lower bathyal variant) M.AtUA.Mu.HolCom).

Summary Description (habitat transitions noted)			
START OF HD VIDEO AT 0m/22:37pm [1]: Transect starts on a relatively flat mud bottom with occasional burrows and many tracks. Epifauna is sparse but there are occasional encounters with <i>Distichoptilum gracile</i> , <i>Umbellula sp</i> and other sea pens, along with Caryophyllid cup corals.			
1m/22:39pm: encounter small depression (c1-2m wide/50cm deep) in the mud suggestive of a shape in the underlying rock. 2m/22:40pm: ROV turns ~180°. 4m/22:42pm: ROV turns ~90°.			
6m/22:44pm: ROV turns 90°. 8m/22:46pm: there is more of a gentle slope on the landscape down to the right, ROV diagonally traverses uphill. 22m/23:00pm: ROV stopped on bottom for 20secs then carry on (good to gauge grain size due to sediment disturbance) 35m/23:13pm: ROV comes off bottom, seafloor obscured. 36m/23:13pm: seafloor re-acquired. 42m/23:19pm: large depressions visible, interpreted as representing small canyon tributary axes, based on the multibeam/plan. The transect bisects several of these, 2-10m wide and 1-4m deep. 54m/23:32pm: ROV stopped to inspect plastic debris (Garlic Baguettes packet with <i>Phelliactis sp</i> anemone attached) in the middle of a depression. Again useful to gauge grain size – here the mud is finer grained. 57m/23:35pm [2]: while the fauna is still sparse and similar to before, small objects start littering the seafloor. These are either juvenile holothurians or their lebensspuren (excrement in this case). The video and images are not clear enough to define this so the holothurian dominance is left as a question mark.			
1h04m/23:42pm [3]: the holothurians are absent hear as the slope ascends over an interfluve again. 1h05m/23:42pm [4]: descending again into a small axis, there is a dense aggregation of live juvenile holothurians forming a stripe on the seafloor (<i>Elpidiidae sp</i> – identification cannot be made further than this from the imagery), ascending out of the axis onto the final interfluve area, further juvenile holothurians are encountered dispersed across the landscape as seen earlier, this time with images confirming that there are live holothurians present. Sea pens become more frequent here but are still generally sparse. HD VIDEO ENDS 1h23m/00:00am.			

Physical Data			
Reef (types can be concurrent)	0% reef	n/a	
		n/a	n/a
Substrates	<ul style="list-style-type: none"> - mud - (sparse) pebbles 		n/a
Geomorphology/Features	<ul style="list-style-type: none"> - Canyon interfluve <ul style="list-style-type: none"> o depression (small ~2m) - Canyon tributaries <ul style="list-style-type: none"> o depressions (large ~10m – tributary axes) o interfluve 		
Annex 1 Types	<ul style="list-style-type: none"> - gullies (mud) 		
Pressures	<ul style="list-style-type: none"> - 1 x plastic (garlic baguettes packet) 		

Biological Data				
Number of Species		31 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	name	size/growth	SACFOR	
585	Acanella arbuscula	L	O	
930	Actinopterygii sp 3	M	R	
278	Anthomastus grandiflorus	M	R	
471	Asteronyx loveni	M	R	
1112	Bathysaurus ferox	L	R	
258	Brosme brosme	L	O	
1077	Caridea (indet)	M	R	
6	Caryophyllia sp	M	O	
2	Ceriantharia	M	R	
984	cf Halcampoididae sp	M	R	
113	Colus sp	M	R	
577	Coryphaenoides guentheri	L	F	
1108	Distichoptilum gracile	L	O	
1116	Elpidiidae sp (juv)	S	O	
559	Gracilechinus acutus norvegicus (white)	M	R	
1113	Halosauridae sp	L	O	
1102	Munnopsidae	M	R	
551	Ophiomuseum lymani	L	O	
1114	Pennatulacea (indet)	M	R	
255	Phelliactis sp 1	L	O	
555	Phormosoma placenta	M	R	
552	Polyacanthonotus rissoanus	L	O	
433	Pseudarchaster sp 1	M	R	
1115	Pterasteridae sp	M	R	
198	Stichastrella rosea	L	R	
440	Synaphobranchus kaupii	L	O	
581	Umbellula sp	L	O	
1073	Unknown annelida or foramanifera	S	R	
1117	UnknownSpring (small)?	M	R	
259	Zoarcidae sp 1	M	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Mu	Atlantic lower bathyal mud	
(sparse, var) M.AtMB.Mu.SpnMeg	(sparse, lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	(sparse) Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
(var) M.AtUA.Mu.HolCom	(lower bathyal) Holothurian dominated community on Atlantic upper abyssal mud	

Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu, (sparse, var) M.AtMB.Mu.SpnMeg (Sparse) 1114 Pennatulacea (indet), 6 Caryophyllia	
2	?(var) M.AtUA.Mu.HolCom, (sparse, var) M.AtMB.Mu.SpnMeg 1116 Elpidiidae sp (juv)?, (Sparse) 1114 Pennatulacea (indet), 6 Caryophyllia	
3	M.AtLB.Mu, (sparse, var) M.AtMB.Mu.SpnMeg (Sparse) 1114 Pennatulacea (indet), 6 Caryophyllia	
4	(var) M.AtUA.Mu.HolCom, (sparse, var) M.AtMB.Mu.SpnMeg 1116 Elpidiidae sp (juv), (Sparse) 1114 Pennatulacea (indet)	

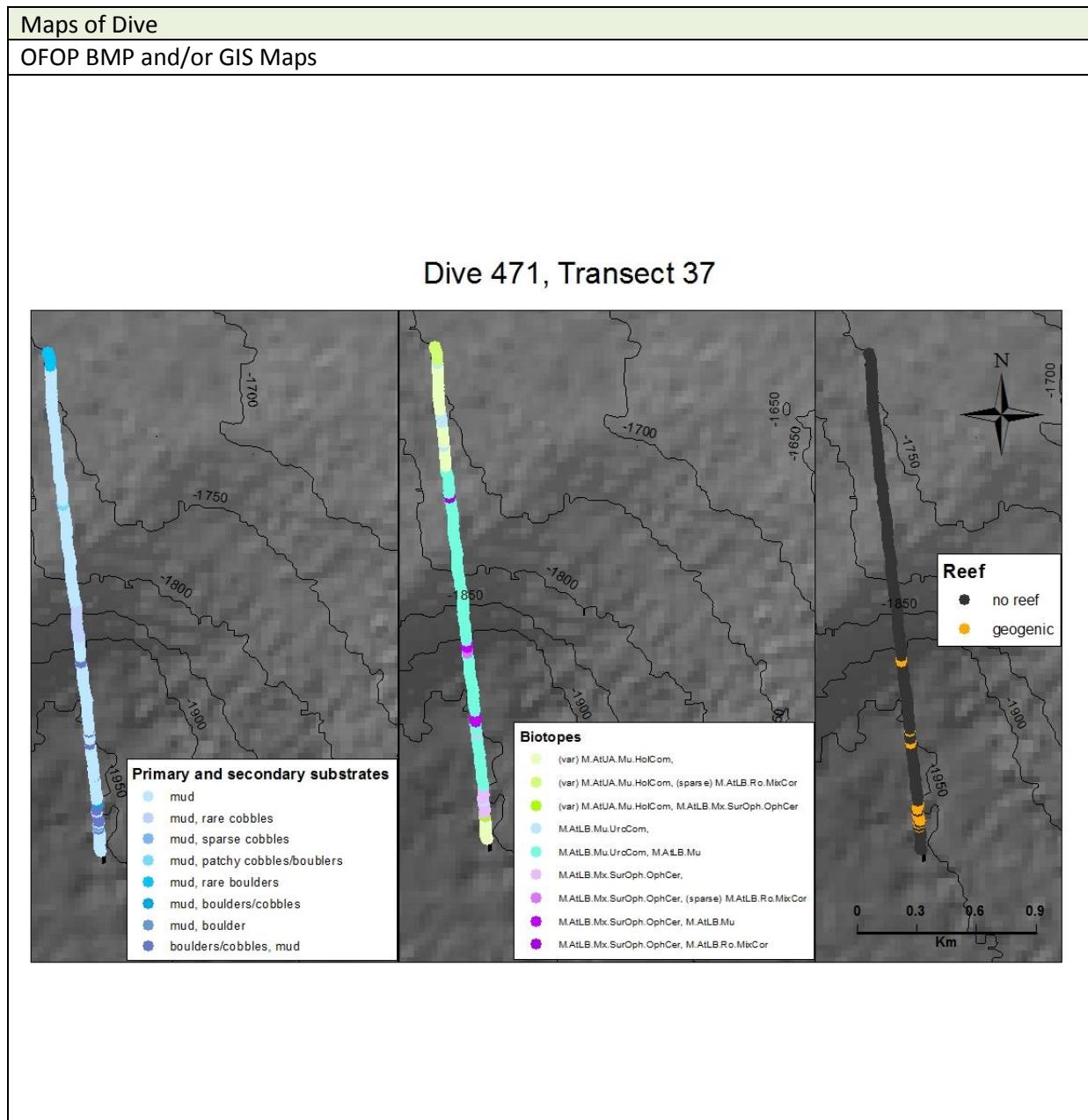
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
(sparse) Sea-pen and burrowing megafauna communities (sparse) Seapen fields	OSPAR ICES	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
- Entirely mud although depressions and gullies visible, sparse sea pens, juvenile holothurian aggregation		

DIVE SUMMARY	
DIVE #	TRANSECT #
471	37

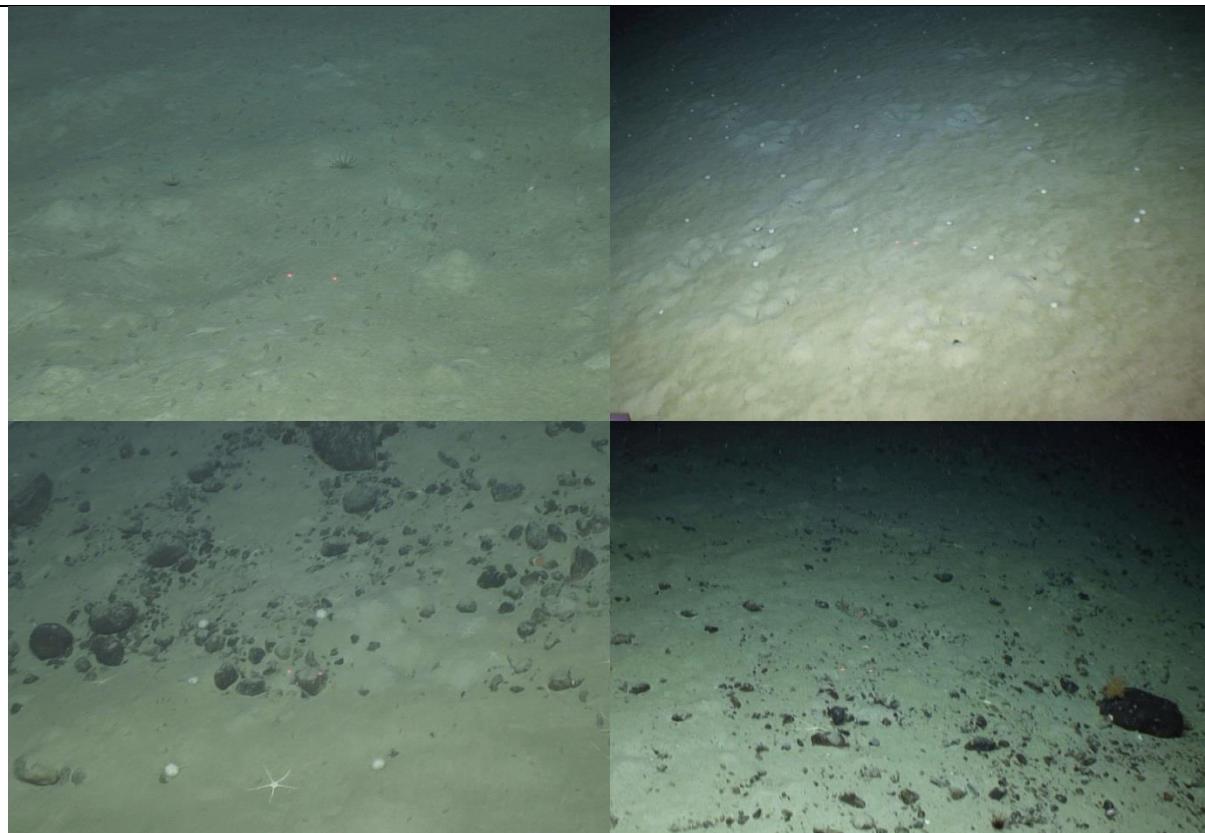
	Start	End
Date & Time	11/07/2017 04:57:47	11/07/2017 06:54:45
Latitude/ Longitude	55.06697717, -10.42723383	55.08927933, -10.42885183
Depth	1943.6	1730.22
Images	IMG_5584-IMG_5588.jpg (not many, & blurry)	
Samples	n/a	

Location	C4
Target Features	Canyon, escarpment
Depth Range	1728.19-1947.4m (av 1851.215m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Juvenile holothurians (possibly cf Amperima sp (OTU628), as some mature individuals are also present) dominate the start of the dive. Later on mature Amperima dominate. ((var) M.AtUA.Mu.HolCom)

Top R. Some areas of dense white Echinidae sp. (OTU559) were encountered, in others urchins still dominated but Phormosoma placenta was the more abundant. (M.AtLB.Mu.UrcCom)

Bottom L. Example of the steep slope of boulders/cobbles with heavy mud veneer. Here, more white *Echinidae* sp are visible, along with *Ophiomuseum lymani* which sometimes dominated particularly over mixed substrates.

Bottom R. Corals were rarely encountered but present. Here a *Stauropathes arctica* is seen in an area of cobbles/boulders and mud otherwise dominated by *O. lymani*.

Summary Description (habitat transitions noted)			
START OF HD VIDEO 0m/04:57am [1] Transect starts on mud, view immediately obscured by disturbed sediment. 2m vision clears, an aggregation of juvenile holothurians (possibly Amperima sp) dominates. 9m [2] boulders/cobbles with mud veneer with <i>Ophiomuseum lymani</i> 9m [3] : Mud with sparse cobbles, co dominance between juvenile holothurians and <i>O.lymani</i> . 10m [4] : patchy boulders/cobbles with mud veneer mosaicked with mud with <i>Ophiomuseum lymani</i> . Rarely corals are also present. 13m [5] mud with sparse white echinoids. 14m [6] : cobbles/boulders with mud veneer and <i>O.lymani</i> 17m [7] : mud rare boulders patchy echinoids, sometimes no dominant epifauna. 28m an aggregation of juvenile/small jellyfish in the water column (appear black, like marine snow, but are red and do not settle on the seabed) continues for a few mins. 30m [8]: mud veneered boulders with <i>O.lymani</i> . 31m [9] : boulders with mud veneer, then mud, both with echinoids dominating. 33m[10] boulders/cobbles, then mud, with <i>O.lymani</i> and sparse corals. 35m [11] much with echinoids displaying patchy dominance, sometimes no dominant epifauna. 50m [12] cobbles/boulders and heavy mud veneer with <i>O.lymani</i> and sparse corals. 51m [13] mud with <i>O.lymani</i> , sometimes sparse epifauna. 52m [14] echinoidas again, sometimes rare cobbles sometimes no dominant fauna. 1h05m Change from <i>Echinidae sp</i> to <i>Phormosoma placenta</i> as the dominant echinoids. 1h06m Frequent <i>Zoroaster fulgens</i> (slender arm morph). 1h25m [15] patchy cobbles on mud with <i>O.lymani</i> and sparse mixed corals (especially <i>Paramuricea sp</i>). 1h32m [16] <i>P.placenta</i> on mud. 1h32m [17] cf <i>Amperima sp</i> (adults) on mud. 1h36m [18] <i>Echinidae sp</i> again dominate (aggregation), mud continues. 1h37m [19] more holothurians. 1h40m [20] another <i>Echinidae sp</i> aggregation. 1h43m [21] holothurians on mud. 1h53m [22] <i>Echinidae sp</i> on mud. 1h53m [23] holothurians with rare mixed corals on sparse boulders. END OF HD VIDEO 1h56m/06:54am			

Physical Data			
Reef (types can be concurrent)	6% reef	6% geogenic	
		n/a	n/a
Substrates	- boulders - cobbles - mud		
Geomorphology/Features	Geomorphology - depression (<2m) - steep slope		
Annex 1 Types	- cobble/boulder field		
Pressures	- 4 x plastic - 2 x metal		

Biological Data				
Number of Species		43spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
554	Actinernus sp	L	R	
605	Actiniaria sp 20	M	R	
930	Actinopterygii sp 3	M	R	
1074	Alepocephaliformes sp 1 cf	L	O	
278	Anthomastus grandiflorus	M	R	
594	Anthoptilum grandiflorum	L	R	
471	Asteronyx loveni	M	R	
1124	Benthothuria sp	L	O	
1077	Caridea (indet)	M	R	
6	Caryophyllia sp	M	R	
2	Ceriantharia	M	R	
1069	Ceriantharia sp (giant)	L	R	
628	cf Amperima sp	M	F	
984	cf Halcampoididae sp	M	R	
113	Colus sp	M	R	
577	Coryphaenoides guentheri	L	O	
566	Coryphaenoides rupestris	L	R	
559	Echinidae sp (white)	M	F	
1056	Flabellum sp	M	R	
1113	Halosauridae sp	L	O	
1039	Hydrolagus cf affinis	L	O	
1125	Hygrosoma sp	L	O	
274	Hymenodiscus coronata/ Br	L	O	
349	Mora moro	L	O	
1102	Munnopsidae	M	R	
1034	Notacanthiformes (indet)	L	R	
551	Ophiomuseum lymani	L	F	
1050	Paramuricea sp	L	R	
1046	Pennatula acculeata	L	O	
1114	Pennatulacea (indet)	M	O	
255	Phelliactis sp 1	L	R	
555	Phormosoma placenta	M	O	
552	Polyacanthonotus rissoanus	L	R	
800	Porifera encrusting (blue)	Crust	R	
1010	Porifera lamellate sp 12 (so	L	O	
433	Pseudarchaster sp 1	M	R	
106	Serpulidae sp 1	M	R	
547	Stauropathes arctica	L	R	
440	Synaphobranchus kaupii	L	O	
446	Trachychyncus sp	L	O	
581	Umbellula sp	L	R	
291	Zoarcidae sp 2	L	R	
988	Zoroaster fulgens (slender)	L	F	

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var) M.AtUA.Mu.HolCom	(Lower bathyal variant) Holothurian dominated community on Atlantic upper abyssal mud	
M.AtLB.Mu	Atlantic lower bathyal mud	
M.AtLB.Mu.UrcCom	Urchin dominated community on Atlantic lower bathyal mud	
M.AtLB.Mx.SurOph.OphCer	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
(sparse) M.AtLB.Ro.MixCor	(sparse) Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	(too sparse)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtUA.Mu.HolCom 628 cf Amperima sp	
2	M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
3	(var) M.AtUA.Mu.HolCom, M.AtLB.Mx.SurOph.OphCer 628 cf Amperima sp, 551 Ophiomuseum lymani	
4	M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
5	M.AtLB.Mu.UrcCom 559 Echinidae sp (white)	
6	M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
7	M.AtLB.Mu.UrcCom 559 Echinidae sp (white)	
8	M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani	
9	M.AtLB.Mu.UrcCom, M.AtLB.Mu 559 Echinidae sp (white)	
10	M.AtLB.Mx.SurOph.OphCer, M.AtLB.Mu 551 Ophiomuseum lymani	
11	M.AtLB.Mu.UrcCom, M.AtLB.Mu 559 Echinidae sp (white)	
12	M.AtLB.Mx.SurOph.OphCer, (sparse) M.AtLB.Ro.MixCor 551 Ophiomuseum lymani	
13	M.AtLB.Mx.SurOph.OphCer, M.AtLB.Mu 551 Ophiomuseum lymani	
14	M.AtLB.Mu.UrcCom, M.AtLB.Mu 555 Phormosoma placenta, 559 Echinidae sp (white), 988 Zoroaster fulgens (robust)	
15	M.AtLB.Mx.SurOph.OphCer, (sparse) M.AtLB.Ro.MixCor	

	551 Ophiomuseum lymani
16	M.AtLB.Mu.UrcCom, M.AtLB.Mu 555 Phormosoma placenta
17	(var) M.AtUA.Mu.HolCom 628 cf Amperima sp
18	M.AtLB.Mu.UrcCom 559 Echinidae sp (white)
19	(var) M.AtUA.Mu.HolCom 628 cf Amperima sp
20	M.AtLB.Mu.UrcCom 559 Echinidae sp (white)
21	(var) M.AtUA.Mu.HolCom 628 cf Amperima sp
22	M.AtLB.Mu.UrcCom 559 Echinidae sp (white)
23	(var) M.AtUA.Mu.HolCom, (sparse) M.AtLB.Ro.MixCor 628 cf Amperima sp

Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
n/a	n/a	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - Whole dive is mud or mud veneered cobbles and boulders. 		

DIVE SUMMARY

DIVE # **472**

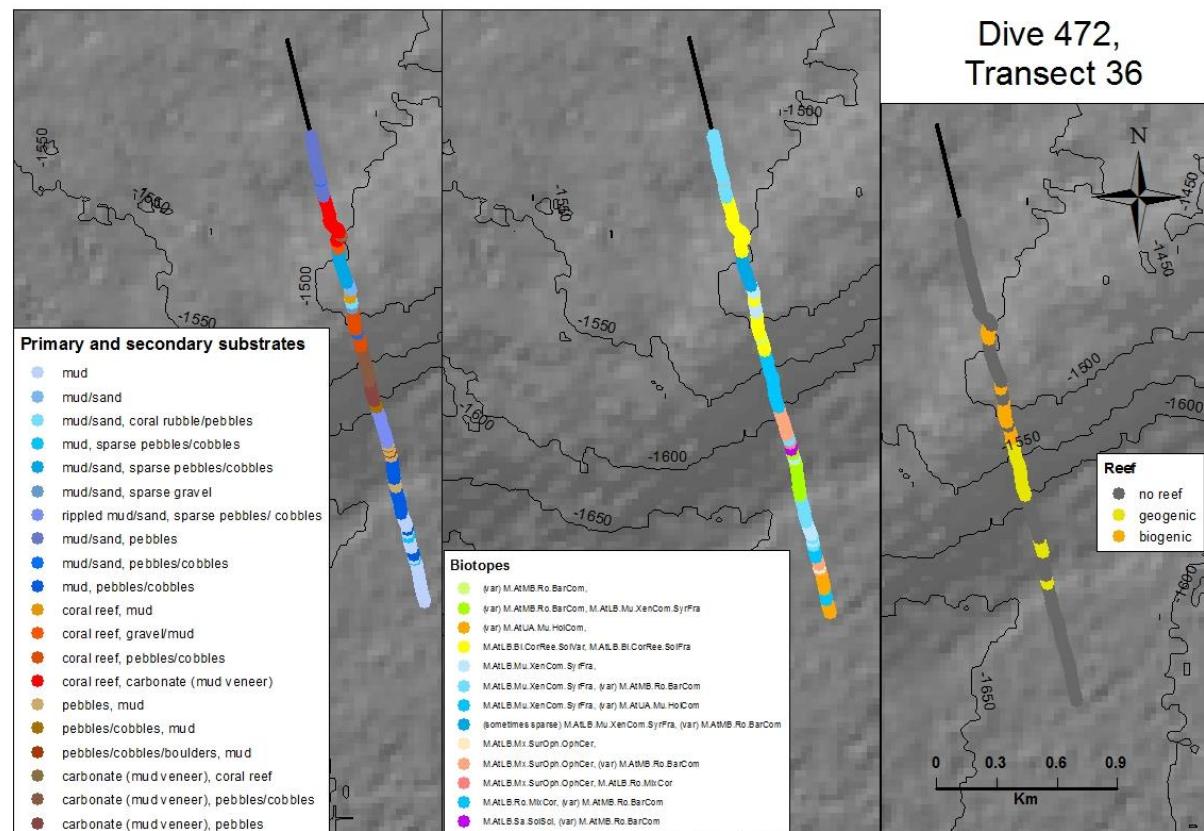
TRANSECT # **36**

	Start	End
Date & Time	11/07/2017 10:58:49	11/07/2017 14:19:00
Latitude/ Longitude	55.15482, -10.28688017	55.17636, -10.293517
Depth	1608.35	1477.71
Images	IMG_5593-IMG_5735.jpg	
Samples	3x pushcores, 1x sponge, 1x isididae	

Location	C4
Target Features	Canyon, Escarpment
Depth Range	1458.38-1627.75m (av 1543.519m)

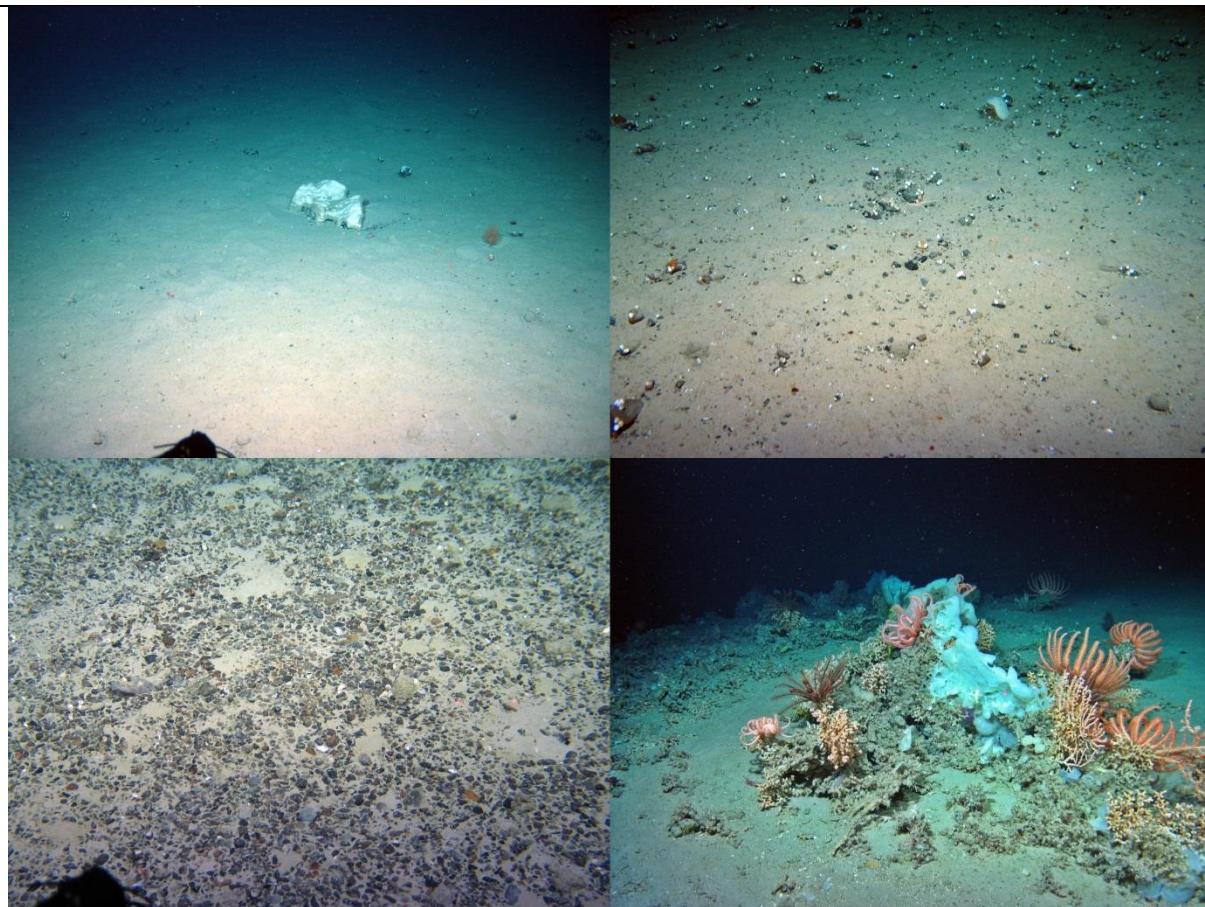
Maps of Dive

OFOP BMP and/or GIS Maps



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Areas of soft sediment are dominated by holothurians, ophiuroids, or xenophyophores, but also occasionally hosts (non-dominant) *Geodia sp* sponges and *Acanella arbuscula*.

Top R. Large areas are soft sediment with sparse pebbles hosting barnacles and occasional other fauna. (M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom)

Bottom L. There are some areas of dense pebbles or pebbles/ cobbles, often with xenophyophores and barnacles similar to the more sparse pebble ground.

Bottom R. There are some vast areas of *Solenosmilia variabilis* reef on this dive that look healthy and diverse. Live reef is mosaicked with natural dead framework which hosts many other species. (M.AtLB.Bi.CorRee.SolVar, M.AtLB.Bi.CorRee.SolFra)

Summary Description (habitat transitions noted)

VIDEO A 0m/10:58am [1] Soft sediment with holothurians (*Amperima* sp). **3m [2]** xenophyophores start to dominate along with holothurians. **6m [3]** Again just holothurians on muddy substrate. **14m [4]** *Ophiomuseum lymani* is now the most frequent fauna on the soft sediment, sparse pebbles and cobbles are dominated by barnacles. **14m [5]** the soft sediment continues without the pebbles. 16m stop for pushcore sampling until **22m [6]** continue until pebbles and cobbles become more dominant on the mud, with barnacles again being the most abundant organism along with *O.lymani* **24m[7]** mud with xenophyophores and holothurians **26m[8]** barnacles/sparse pebbles and cobbles return as a mosaic **29m[9]** xenophyophores on mud continue for a while mosaicking again at **30m[10]** with barnacles and pebbles/cobbles, back to **32m [11]** xenophyophores on mud **36m [12]** mosaic with barnacles and pebbles **45m[13]** an area of denser pebbles allow the barnacles to dominate, but still xenophyophores occur here. 48m-54m stop to test the sediment and sample. 54m mud and pebbles fluctuate in dominance but the assemblage continues. 57m-58m stop to view pycnogonid. **1h6m [14]** cobbles/boulders/pebbles barnacles still dominante, but some corals and sponges are present. **1h7m [15]** dense pebbles with xenophyophores **1h7h [16]** cobbles dominate densely with pebbles, xenophyophores are still present along with dominant barnacles, and some corals and sponges. The had substrate becomes less dense until **1h8m58s [17]** mud with sparse pebbles hosting cup corals and barnacles, occasional carbonate patches and boulders. **1h10m [18]** *O.lymani* on the dominant mud/sand while carbonate/boulders host mixed corals **1h11m [19]** back to the mud/xenophyophores with pebbles/barnacles **1h12m[20]** mud/*O.lymani* and pebbles/barnacles with some corals and sponges also present 1h14-1h14m stop for imagery. Continue and pebbles become dense. **1h23m [21]** reached the base of an exposed carbonate crust slope with mud veneer and pebbles/cobbles/boulders of varying density. Stichopathes sp (OTU560) dominates the carbonate, while barnacles adhere to loose hard substrate. 1h32-1h33 stop to view octopus and corals. Mud veneer grows thicker. **1h41m [22]** Reach the edge of the first patch of healthy-looking *Solenosmilia variabilis* reef. 1h 47m [23] short patch of mud/pebbles with barnacles and sparse xenophyophores. 1h48m [24] large *S. variabilis* reef patch, several stops for imagery. **1h58m [25]** mud/sand with xenophyophores and sparse gravel changing into *S. variabilis* coral rubble until **END OF HD VIDEO A 2h01m/12:59pm. START OF HD VIDEO B 0m/13:00pm.** Continue until **1m [26]** *S. variabilis* reef on an upslope reaching the crest of a hill at 3m. 4m-17m stopped for imagery and sampling. **17m [27]** mud/sand xenophyophores, downslope visible off to left. **20m [28]** sparse pebbles/cobbles/boulders on mud/sand with xenophyophores in varying densities and barnacles on the hard substrate. **31m[29]** *S.variabilis* reef, great footage. 33m reach sharp downslope/escarpment, bottom not visible as ROV proceeds over edge. 35m run to face edge with reef at top and near vertical mud veneered carbonate (?) dropoff. Stop for imagery. 38m turn back to descend escarpment, glimpses of very steep mud slope and patches of coral rubble. 39m reach better angled downslope where bottom now visible again as ROV laterals downslope over *S.variabilis* reef. 42m slope flattens out, coral reef continues. 43m ROV starts moving forwards along and gently upslope over continued coral reef. **56m [30]** end of reef to reach again mud/sand with sparse pebbles and xenophyophores/barnacles. 1h2m [31] *O.lymani* and barnacles on mud/pebbles/cobbles some mixed corals and sponges also present but not dominant. 1h3m return to xenophyophores/mud barnacles/pebbles until **END OF HD VIDEO B 1h18m/14:19pm.**

Physical Data			
Reef (types can be concurrent) NB >10% may be healthy reef	35% reef	16% geogenic	
		19% biogenic	10-25% living
			75-90% dead
Substrates	<ul style="list-style-type: none"> - boulders - carbonate (mud veneer) - cobbles - coral reef (Solenosmilia) - coral rubble - gravel - mud - mud/sand - pebbles - rippled mud/sand 		
Geomorphology/Features	Canyon <ul style="list-style-type: none"> - crest of a hill - flatter landscape - occasional carbonate patches/boulders Escarpmment <ul style="list-style-type: none"> - escarpment/sharp downslope - steep slope 		
	<ul style="list-style-type: none"> - coral reef - (pebble/)cobble field - (pebble/)cobble/boulder field - sloping bedrock 		
Pressures	<ul style="list-style-type: none"> - 2 x plastic 		

Biological Data					
Number of Species		84 spp			
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)					
O.T.U.	Name	Size/Growth	SACFOR		
585	Acanella arbuscula	L	O		
4	Actiniaria sp 1	M	R		
1047	Actinoscyphiidae sp 1 (pink)	L	O		
132	Actinostolidae sp 1	L	O		
1066	Adamsia sp (Paguridae Associated)	M	R		
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	O		
278	Anthomastus grandiflorus	M	R		
311	Anthothelia grandiflora	Mass	R		
592	Antipatharia sp 4 cf Stauropatthes	L	R		
146	Aphroditidae sp 1	M	R		
20	Ascidiae sp 2	L	F		
471	Asteronyx loveni	M	R		
1041	Bathycrinidae sp 1	M	R		
284	Bathyphantes sp (brown)	L	O		
1077	Caridea (indet)	M	R		
6	Caryophyllia sp	M	R		
6	Caryophyllia sp	M	R		
1111	Cataetyx laticeps	L	R		
2	Ceriantharia	M	R		
289	cf Clavulariidae sp	Mass	R		
1060	cf Haliperteris sp	L	O		
1054	Chirostylidae (indet)	M			
1008	Chrysogorgidae sp 1	L	R		
82	Cirripedia sp	Mass	F		
1059	Colossendeis sp	L	R		
577	Coryphaenoides guentheri	L	O		
566	Coryphaenoides rupestris	L	O		
1072	Crinoidea sp (10 arm)	L	R		
559	Echinidae sp (white)	M	R		
1056	Flabellum sp	M	R		
307	Gorgonacea sp 7 (pink) cf Isidella	L	R		
628	Holothuroidea sp 4 (cf Amperima)	M	F		
651	Hoplostethus atlanticus	L	O		
1039	Hydrolagus cf affinis	L	O		
274	Hymenodiscus corona/ Brisinga endeca	L	F		
1064	Isididae sp (fine branching)	L	R		
1070	Jasonisis sp (pink) SolenoAssoc	L	R		
578	Keratoisis sp 2	L	R		
315	Koehlermetra porrecta	L	F		
557	Lepidisis sp	L	R		
1055	Liponema sp	L	R		
277	Margarites sp 1	S	R		
349	Mora moro	L	R		
563	Neocytus helgae	L	R		
1009	Notacanthidae sp 1 (Notacanthus cheminizi)	L	O		
659	Octopodidae (indet)	L	R		
551	Ophiomuseum lymani	L	F		
1076	Ophiuroidea (indet)	S	R		
205	Paguridae spp	M	R		
1050	Paramuncea sp	L	O		
1042	Parantipathes sp	L	O		
1122	Pelagothuridae sp	M	R		
1046	Pennatula aculeata	L	O		
1114	Pennatulacea (indet)	M	R		
1059	Pennatulacea sp (cf Kophoblemnidae)	L	R		
436	Pentametrocrinus atlanticus	L	R		
555	Phormosoma placenta	M	O		
552	Polyacanthonotus rissoanus	L	R		
1030	Polymastia cf boletiformis	L	O		
263	Porania pulvillus	L	R		
263	Porania pulvillus (poss stormi)	L	R		
800	Porifera encrusting (blue)	Crust	R		
1	Porifera encrusting sp 1 (white)	Crust	R		
1010	Porifera lamellate sp 12 (solen Assoc)	L	O		
1010	Porifera lamellate sp 12 (solen Assoc)	L	O		
1051	Porifera massive globose sp 15 (solen Rubt)	M	R		
137	Porifera massive globose sp 6	M	R		
611	Porifera massive lobose sp 21 (Hertwigia?)	L	R		
83	Porifera massive lobose sp 6 (cf Geodia)	L	O		
433	Pseudarchaster sp 1	M	R		
1080	Pseudoanthomastus sp	L	R		
652	Rajiformes sp 1 poss Neoraja caerulea	L	R		
204	Reteporella sp 1	M	R		
573	Solaster endeca	L	R		
700	Solenosmilia variabilis	L	F		
569	Squaliformes (Etmopteridae?)	L	O		
547	Stauropatthes arctica	L	R		
560	Stichopathes sp	L	F		
440	Synaphobranchus kaupii	L	O		
261	Syringammina fragilissima	M	F		
581	Umbellula sp	L	O		
1123	Unknown Mud Fluff (Hydro/Foram)	S	R		
259	Zoarcidae sp 1	M	R		
988	Zoroaster fulgens (robust)	L	F		

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Mu.XenCom.SyrFra a	Syringammina fragilissima field on Atlantic lower bathyal mud	Mud and sand emergent fauna (ICES)
(var) M.AtMB.Ro.BarCom	(lower bathyal variant) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
(var) M.AtUA.Mu.HolCom	(lower bathyal variant) Holothurian dominated community on Atlantic upper abyssal mud	
M.AtLB.Bi.CorRee.SolVar	Atlantic lower bathyal live <i>Solenosmilia variabilis</i> reef (biogenic structure)	(<i>Solenosmilia variabilis</i> variant of) <i>Lophelia pertusa</i> reefs (OSPAR); Cold-water coral reef (ICES), <i>Solenosmilia variabilis</i> reef (ICES subcategory)
M.AtLB.Mx.SurOph.OphCer	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Sa.SolScl	Solitary scleractinian field on Atlantic lower bathyal sand	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Cup-corals fields (ICES subcategory)
M.AtLB.Bi.CorRee.SolFra	Mixed coral assemblage on Atlantic lower bathyal <i>Solenosmilia</i> reef framework (biogenic structure)	(<i>Solenosmilia variabilis</i> variant of) <i>Lophelia pertusa</i> reefs (OSPAR); Cold-water coral reef (ICES), <i>Solenosmilia variabilis</i> reef (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtUA.Mu.HolCom 628 Holothuroidea sp 4 cf Amperima	
2	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtUA.Mu.HolCom 261 Syringammina fragilissima, 628 Holothuroidea sp 4 cf Amperima	
3	(var) M.AtUA.Mu.HolCom	

	628 Holothuroidea sp 4 cf Amperima
4	M.AtLB.Mx.SurOph.OphCer, (var) M.AtMB.Ro.BarCom 82 Cirripedia sp, 551 Ophiomuseum lymani
5	M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani
6	M.AtLB.Mx.SurOph.OphCer, (var) M.AtMB.Ro.BarCom 82 Cirripedia sp, 551 Ophiomuseum lymani
7	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtUA.Mu.HolCom 261 Syringammina fragilissima, 628 Holothuroidea sp 4 cf Amperima
8	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp
9	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima
10	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp
11	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima
12	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp
13	(var) M.AtMB.Ro.BarCom, M.AtLB.Mu.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima
14	(var) M.AtMB.Ro.BarCom 82 Cirripedia sp
15	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima
16	(var) M.AtMB.Ro.BarCom, M.AtLB.Mu.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima
17	M.AtLB.Sa.SolScl, (var) M.AtMB.Ro.BarCom 1058 Caryophyllidae/Fabellidae (indet), 82 Cirripedia sp
18	M.AtLB.Mx.SurOph.OphCer, M.AtLB.Ro.MixCor 551 Ophiomuseum lymani
19	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp
20	M.AtLB.Mx.SurOph.OphCer, (var) M.AtMB.Ro.BarCom 82 Cirripedia sp, 551 Ophiomuseum lymani
21	M.AtLB.Ro.MixCor, (var) M.AtMB.Ro.BarCom 560 Stichopathes sp, 82 Cirripedia sp
22	M.AtLB.Bi.CorRee.SolVar, M.AtLB.Bi.CorRee.SolFra 700 Solenosmilia variabilis, 1010 Porifera lamellate sp 12
23	(var) M.AtMB.Ro.BarCom 82 Cirripedia sp
24	M.AtLB.Bi.CorRee.SolVar, M.AtLB.Bi.CorRee.SolFra 700 Solenosmilia variabilis, 1010 Porifera lamellate sp 12
25	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima
26	M.AtLB.Bi.CorRee.SolVar, M.AtLB.Bi.CorRee.SolFra 700 Solenosmilia variabilis, 1010 Porifera lamellate sp 12
27	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima
28	(sometimes sparse) M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom

	261 Syringammina fragilissima, 82 Cirripedia sp
29	M.AtLB.Bi.CorRee.SolVar, M.AtLB.Bi.CorRee.SolFra 700 Solenosmilia variabilis, 1010 Porifera lamellate sp 12
30	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp
31	M.AtLB.Mx.SurOph.OphCer, (var) M.AtMB.Ro.BarCom 551 Ophiomuseum lymani, 82 Cirripedia sp
32	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp

Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Mud and sand emergent fauna (ICES) (Solenosmilia variabilis variant of) Lophelia pertusa reefs	ICES OSPAR	
Cold-water coral reef	ICES	
- Solenosmilia variabilis reef	ICES subcategory	
- Soft-bottom coral garden: Cup-coral fields	ICES subcategory	
- Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	ICES subcategory	
Listed Species Encountered (Fish, Count)		
Hoplostethus atlanticus	5	OSPAR/ IUCN

Additional Comments		
<ul style="list-style-type: none"> The <i>Solenosmilia variabilis</i> reef here is healthy looking. All the <i>Solenosmilia</i> reefs on this survey are lower-lying than <i>Lophelia pertusa</i> reefs, and often host many sponges. 		

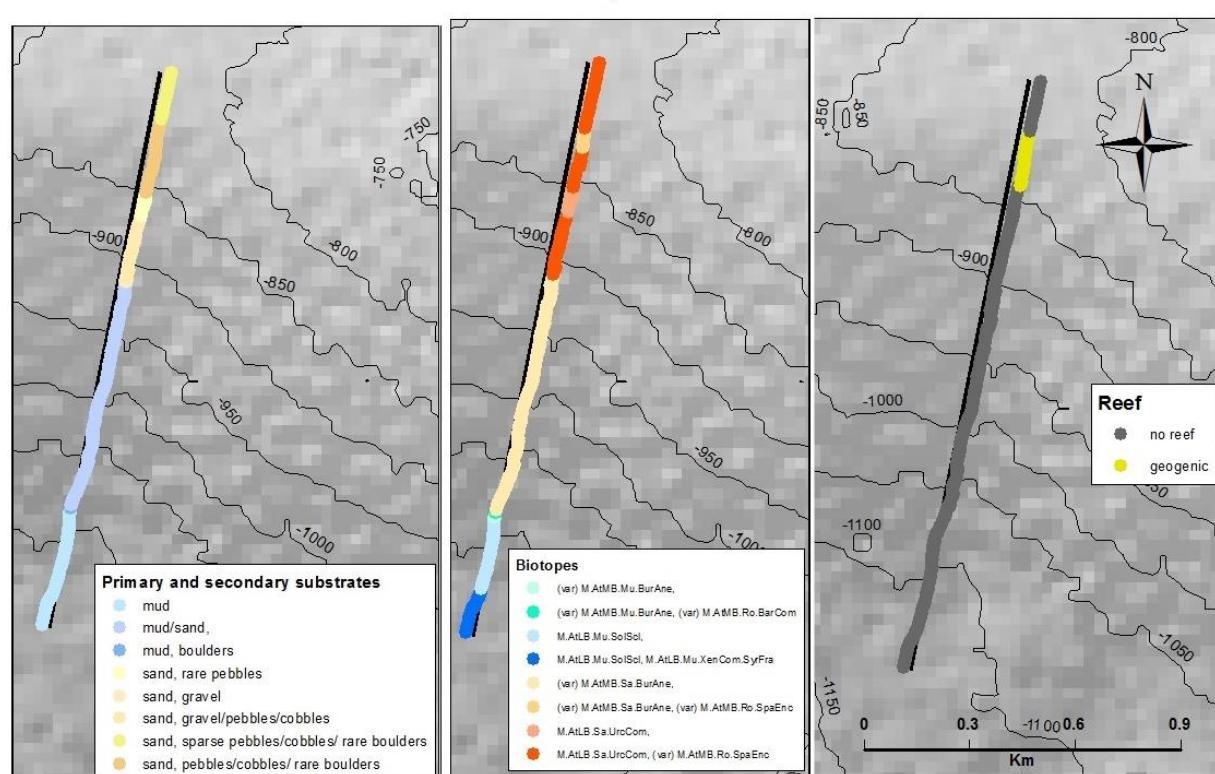
DIVE SUMMARY			
DIVE #	473	TRANSECT #	26

	Start	End
Date & Time	11/07/2017 18:21:10	11/07/2017 20:49:11
Latitude/ Longitude	55.13452683, -10.14277	55.14921, -10.13484983
Depth	1100.06	803.32
Images	IMG_5738-IMG_5919	
Samples	5 x Cidaris cidaris	

Location	C4
Target Features	Canyon, Escarpment
Depth Range	800.37-1100.06m (Av. 925.547m)

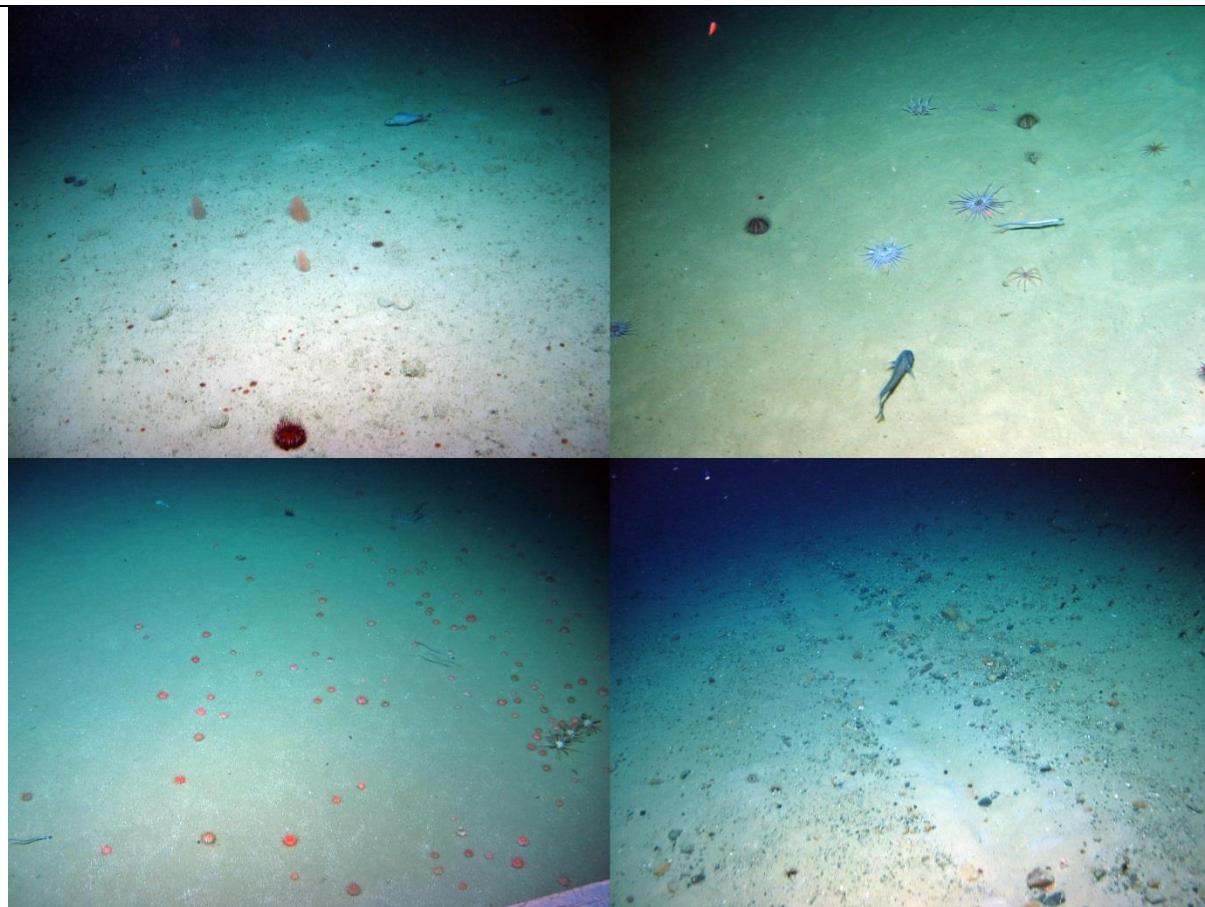
Maps of Dive

OFOP BMP and/or GIS Maps



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The dive starts on epifaunally diverse soft sediment with dense cup corals, xenophyophores (*Syringammina fragilissima*) and *Acanella arbuscula* among other fauna. (M.AtLB.Mu.SolScl, M.AtLB.Mu.XenCom.SyrFra)

Top R. An example of the mixed burrowing anemones assemblage that occurs throughout much of the dive. ((var) M.AtMB.Sa.BurAne)

Bottom L. There were a couple of dense aggregations on this dive – here Echinidae sp (OTU194) with *Cidaris cidaris* also visible. An aggregation of *Zoroaster fulgens* (robust morph) sea stars was also encountered. (M.AtLB.Sa.UrcCom)

Bottom R. Dense pebbles and cobbles on sand toward the end of the dive presented where the escarpment was expected. *Pachycerianthus multiplicatus* was abundant here with only sparse encrusting fauna on the hard substrate. Furrows such as the one seen here suggest bottom-trawling activity in the area. ((var) M.AtMB.Sa.BurAne, (var) M.AtMB.Ro.SpaEnc)

Summary Description (habitat transitions noted)

HD VIDEO A STARTS 0m/ 18:21pm [1]: Epifaunally rich flat /gently upsloping mud bottom with dense cup corals and xenophyophores, *Acanella arbuscula* is co-dominant, with diverse burrowing anemones among other fauna. **7m [2]:** xenophyophores now occasional or absent, dominant cup corals and *A. arbuscula*, more occasional sea pens present. 8m: cup corals continue, now with *Phormosoma placenta* 15m: an aggregation of *Zoroaster fulgens* (robust morph) is encountered 17m: cup corals continue, no co-dominant species. **18m [3]:** mixed burrowing anemones dominate, especially cf Halcampoididae and Sagartiidae spp. The sediment may be becoming coarser, though it is hard to detect when the changes occur. **19m [4]:** a few boulders host mainly barnacles, although several anemone species and corals are also present. Burrowing anemones continue on surrounding soft sediment. **19m [5]:** continued mixed burrowing anemones (Halcampoididae, Sagartiidae, Ceriantharia), urchins frequent (*Phormosoma placenta*, dark *Echinidae* sp (OTU1119)). Changing dominance in species, but assemblage consistent. 53m stop to view Epizoanthus/Paguridae spp. 57m: off bottom again. 1h5m: sediment now coarse sand/gravel, assemblage continues, although urchins now mainly *Cidaris cidaris*. 1h5m: stop, sediment disturbed, vision obscured. 1h8m: continue on, vision restored. **1h9m [6]:** *C. cidaris* apparently dominates from the standard ROV viewing height, although up close Halcampid anemones are clearly abundant. Added pebbles and cobbles host a sparse encrusting community dominated by serpulids. 1h10m: stop to view epizoanthus/paguridae spp again, then for sampling *C. cidaris*(x3). 1h18: continue on. 1h19m: stop to photograph *Phelliactis* sp. 1h21m: continue. 1h25m: stop to sample *C. cidaris* (x5). 1h43m: continue. 1h46m: Epifauna becomes more sparse. **1h49m [7]:** return to sand, rare pebbles, epifauna more sparse, urchins dominate still, here *C. cidaris*. 1h50m: dense aggregation of pink *Echinidae* sp (OTU194) 1h51m: return to sparse urchins, again *C. cidaris* dominates. 1h51m: stopped for photography, vision obscured. 1h55m: continue, vision clear. 1h56m: stop, vision obscured. 1h56m: continue, clear vision. **1h57m [8]:** patchy pebbles and cobbles/rare boulders again host sparse encrusting fauna dominated by Serpulids, urchins on sand continue. **END OF HD VIDEO A**
2h0m/20:21pm. START OF HD VIDEO B 0m/20:24pm. pebbles becomes denser, urchin/serpulid community continues. **2m [9]:** *Pachycerianthus multiplicatus* becomes dominant in the sediment, although *C. cidaris* still present (serpulids still on rock). **5m [10]:** back to *C. cidaris* dominance on sediment (serpulids still on rock). 8m: pebbles/cobbles becomes sparse, with rare boulders. 15m: sampling pushcores (x2) until **24m/ 20:49 END OF HD VIDEO B.**

Physical Data			
Reef (types can be concurrent)	6%	6% geogenic	
		n/a	n/a
		n/a	
Substrates	<ul style="list-style-type: none"> - boulders (rare) - cobbles - gravel - mud - mud/sand - pebbles/cobbles - pebbles - sand 		
Geomorphology/Features	Canyon <ul style="list-style-type: none"> - furrows - cobble field 		
Annex 1 Types	cobble field		
Pressures	<ul style="list-style-type: none"> - 3 x plastic - 1 x fishing line - 5 x possible trawl marks 		

Biological Data				
Number of Species		70spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U	name	size/growth	SACFOR	
585	Acanella arbuscula	L	F	
608	Acanthogorgia cf armata	L	O	
499	Actinaugue richardi	M	R	
1120	Actinaria sp (largeRed)	L	O	
582	Actinaria sp 18 (sun)	M	F	
605	Actinaria sp 20	M	R	
930	Actinopterygii sp 3	M	R	
594	Anthoptilum grandiflorum	L	O	
1120	Anthoptilum sp (darkAxis)	L	O	
1097	Aphanopsis carbo	L	O	
188	Araeosoma fenestratum	L	R	
432	Benthogone sp (blue)	L	F	
12	Bolocera tuediae	L	O	
267	Bonellia viridis	M	R	
258	Brosme brosme	L	O	
584	Caryophyllia sp 5 (bullseye)	M	R	
1058	Caryophyllidae/Fabellidae (indet)	M	F	
2	Ceriantharia	M	O	
1069	Ceriantharia sp (giant)	L	O	
984	cf Halcampoididae sp	M	F	
211	Cidaris cidaris	M	F	
82	Cirripedia sp	Mass	R	
1059	Colossendeis sp	L	R	
113	Colus sp	M	R	
120	Corymorphidae sp	M	R	
577	Coryphaenoides guentheri	L	O	
566	Coryphaenoides rupestris	L	O	
1072	Crinoidea sp (10 arm)	L	R	
1108	Distichoptilum gracile	L	O	
1119	Echinidae sp (dark)	M	F	
194	Echinidae sp (pink)	M	F	
559	Echinidae sp (white)	M	R	
1094	Echinothuroidea sp (purple)	L	R	
317	Epizoanthus sp 1 (Paguridae Associated)	M	O	
1005	Galeus melastomus	L	R	
23	Halcampoididae sp 1	S	R	
1098	Hormathiidae sp	L	O	
1024	Hydrolagus cf mirabilis	L	O	
249	Lepidion eques	L	O	
273	Lophius piscatorius	L	O	
1121	Majoidea sp	L	R	
536	Mesothuria intestinalis	M	R	
654	Molva molva	L	O	
349	Mora moro	L	O	
339	Munida tenuimana	M	O	
383	Myxine glutinosa	L	R	
1009	Notacanthidae sp 1	L	R	
659	Octopodidae (indet)	L	O	
458	Pachycerianthus multiplacatus	M	O	
205	Paguridae spp	M	O	
1046	Pennatula acculeata	L	O	
1114	Pennatulacea (indet)	M	R	
1059	Pennatulacea sp (cf Kophobelemnidae)	L	O	
1083	Pennatulacea sp (thin)	L	R	
255	Phelliactis sp 1	L	O	
555	Phormosoma placenta	M	F	
1020	Phycis blennoides	L	O	
552	Polyacanthonotus rissoanus	L	R	
433	Pseudarchaster sp 1	M	R	
652	Rajiformes sp 1 poss Neoraja caerulea	L	O	
1118	Sagartiidae sp (wide oral disc)	L	O	
41	Sagartiidae sp 3	M	F	
106	Serpulidae sp 1	M	O	
198	Stichastrella rosea	M	R	
440	Synaphobranchus kaupii	L	F	
261	Syringammina fragilissima	M	O	
1017	Teuthidae (indet)	M	R	
581	Umbellula sp	L	O	
259	Zoarcidae sp 1	M	R	
988	Zoroaster fulgens (robust)	L	F	

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var) M.AtMB.Mu.BurAne	(lower bathyal variant) Burrowing anemone field in Atlantic mid bathyal mud	Anemone aggregations (ICES), Soft-bottom anemone aggregations (ICES subcategory)
(var) M.AtMB.Sa.BurAne	(lower bathyal variant) Burrowing anemone field in Atlantic mid bathyal sand	Anemone aggregations (ICES), Soft-bottom anemone aggregations (ICES subcategory)
(var) M.AtMB.Ro.BarCom	(lower bathyal variant) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
(var) M.AtMB.Ro.SpaEnc	(lower bathyal variant) Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata	
M.AtLB.Mu.SolScl	Solitary scleractinian field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden (ICES subcategory); Cup-coral fields (ICES subcategory);
M.AtLB.Mu.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mud	Mud and sand emergent fauna (ICES)
M.AtLB.Sa.UrcCom	Urchin dominated community on Atlantic lower bathyal sand	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.SolScl, M.AtLB.Mu.XenCom.SyrFra 1058 Caryophyllidae/Fabellidae (indet), 261 Syringammina fragilissima, 585 Acanella arbuscula	
2	M.AtLB.Mu.SolScl 1058 Caryophyllidae/Fabellidae (indet), 555 Phormosoma placenta, 585 Acanella arbuscula, 988 Zoroaster fulgens (robust)	
3	(var) M.AtMB.Mu.BurAne 984 cf Halcampoididae, 41 Sagartiidae sp3	
4	(var) M.AtMB.Mu.BurAne 984 cf Halcampoididae, 41 Sagartiidae sp3, 82 Cirrepedia sp	
5	(var) M.AtMB.Sa.BurAne 2 Ceriantharia, 41 Sagartiidae sp3, 1119 Echinidae sp, 211 Cidaris cidaris, 984 cf Halcampoididae, 555 Phormosoma placenta	
6	M.AtLB.Sa.UrcCom, (var) M.AtMB.Ro.SpaEnc 211 Cidaris cidaris, 23 Halcampoididae, 106 Serpulidae	
7	M.AtLB.Sa.UrcCom 194 Echinidae sp (pink), 211 Cidaris cidaris	
8	M.AtLB.Sa.UrcCom, (var) M.AtMB.Ro.SpaEnc 211 Cidaris cidaris, 106 Serpulidae	

9	(var) M.AtMB.Sa.BurAne, (var) M.AtMB.Ro.SpaEnc 458 <i>Pachycerianthus multiplicatus</i> , 106 Serpulidae
10	M.AtLB.Sa.UrcCom, (var) M.AtMB.Ro.SpaEnc 211 <i>Cidaris cidaris</i> , 106 Serpulidae

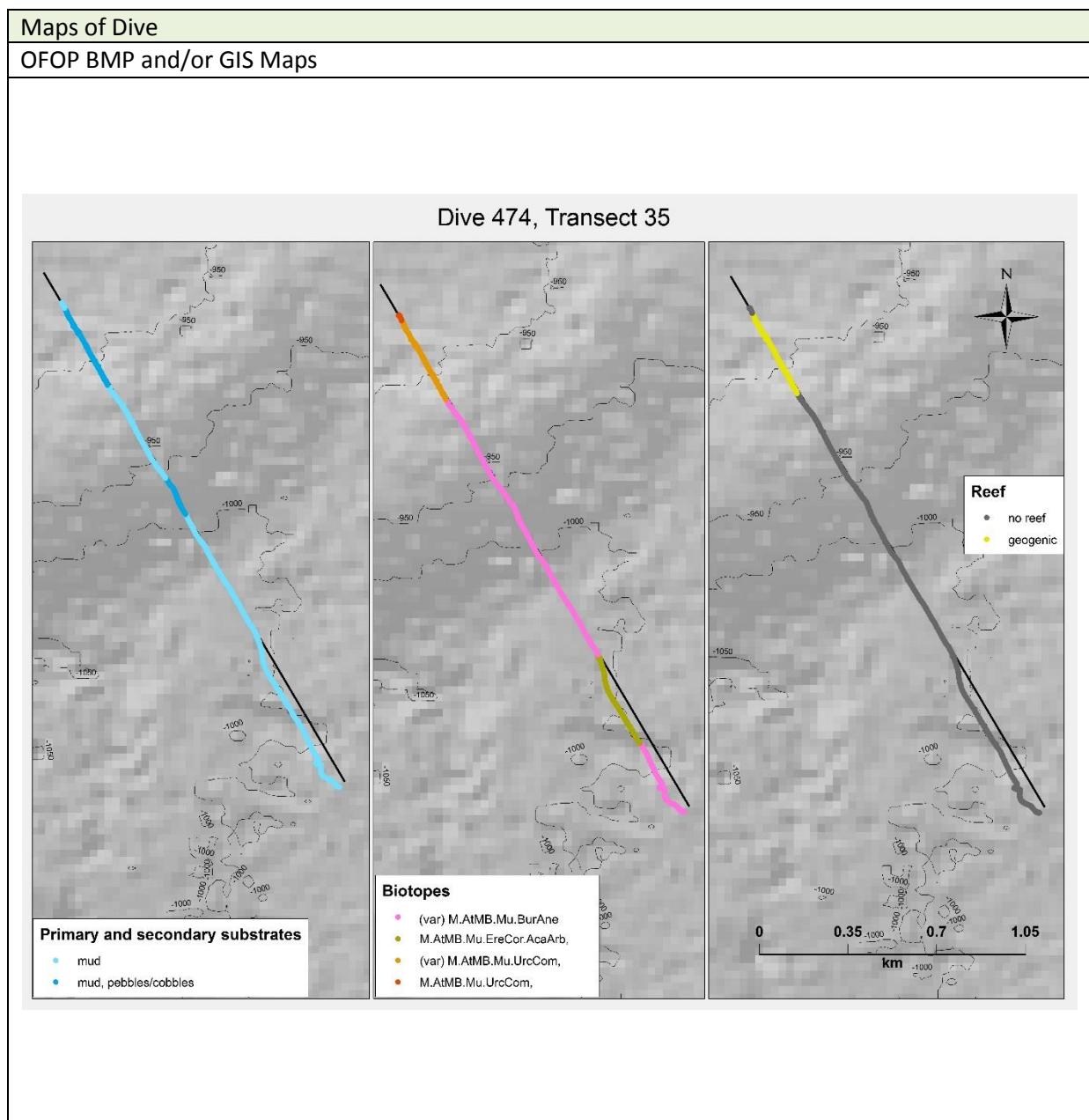
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens <ul style="list-style-type: none"> • Soft-bottom coral garden <ul style="list-style-type: none"> ○ Cup-coral fields Mud and sand emergent fauna Anemone aggregations Soft-bottom anemone aggregations	ICES/OSPAR ICES subcategory ICES subcategory ICES ICES ICES subcategory	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - Biotope hard to define at start, interpreted as a solitary cup coral community with changing co-dominant species. - The epifaunally diverse soft sediment is more diverse than the hard substrate on this transect. 		

DIVE SUMMARY	
DIVE #	TRANSECT #
474	35

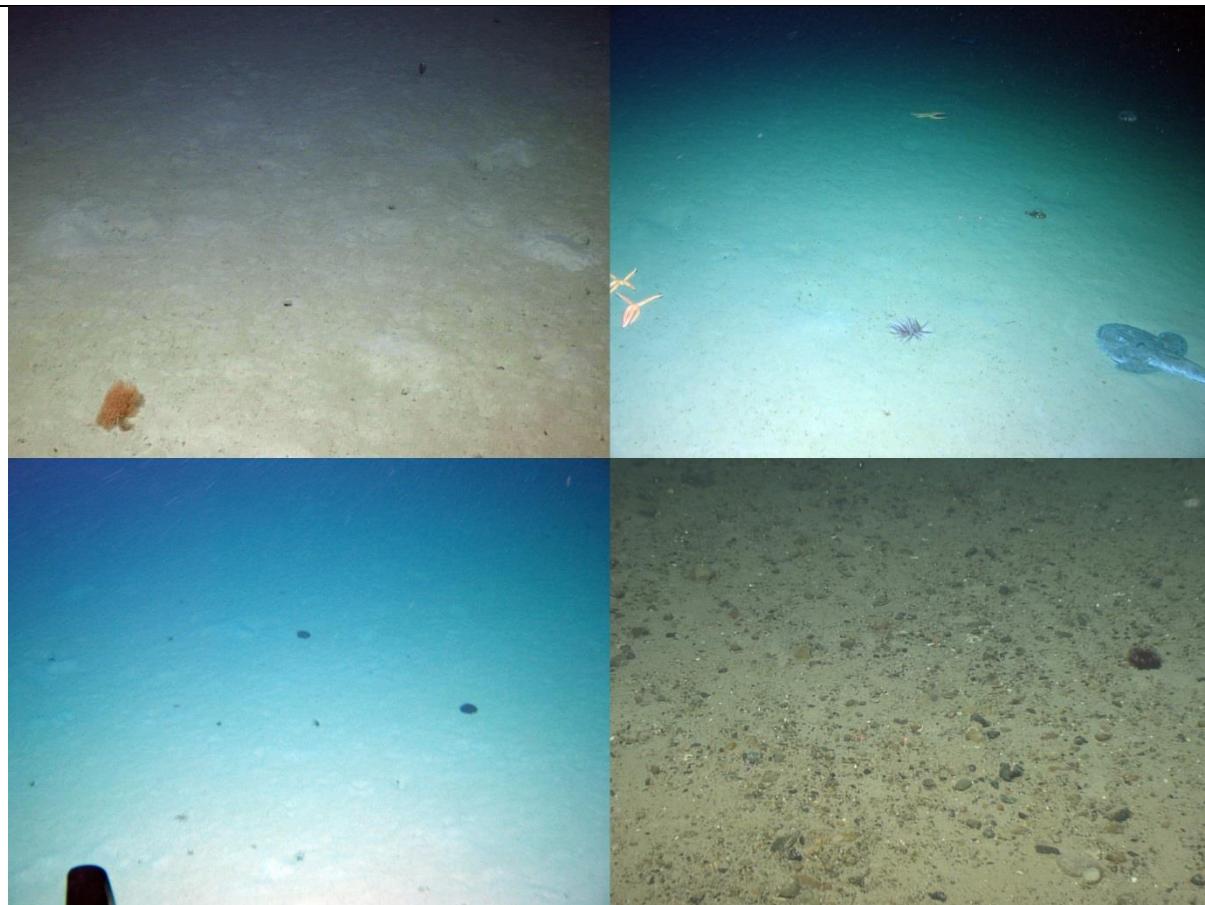
	Start	End
Date & Time	13/07/2017 09:45:33	13/07/2017 12:18:46
Latitude/ Longitude	55.96163567, -9.38106733	55.97998633, -9.39649267
Depth	976.76	957.97
Images	IMG_5903-IMG_5988.JPG	
Samples	2 x pushcores	

Location	N of C1
Target Features	Unidentified
Depth Range	916.49-1004.4m (av. 965.56m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The majority of the dive was spent over muddy substrate with fairly diverse epifauna. One area was dominated by *Acanella arbuscula* and Cerianthid anemones. (M.AtMB.Mu.EreCor.AcaArb)

Top R. *Zoroaster fulgens* (robust morph) was encountered frequently throughout the dive, and at one point was dominant. Here they are seen with a bolocera-like mud-dwelling anemone (OTU41) and a monkfish (*Lophius piscatorius*). ((var) M.AtMB.Mu.BurAne)

Bottom L. Cerianthid anemones were dominant throughout the dive, towards the end urchins were particularly frequent, especially *Phromosoma placenta*. (M.AtMB.Mu.UrcCom)

Bottom R. There are two patches where hard substrate was encountered, this being an example of the denser patch. Occasional encrusting/hard substrate fauna were present, but urchins were dominant (again mainly *Phromosoma placenta*). ((var) M.AtMB.Mu.UrcCom)

Summary Description (habitat transitions noted)

HD VIDEO A STARTS AT 0m/09:45am [1] The majority of this dive is spent on relatively flat muddy substrate. Burrowing cerianthid anemones are dominant, but holothurians, urchins, and asteroids are also abundant, along with larger burrowing anemones. The water is slightly cloudy. 10m ROV moves diagonally right. 11m ROV moves diagonally left. 12m ROV moves diagonally right. 13m ROV moving forwards. **24m [2]** The mud and epifauna continue, now *Acanella arbuscula* is also frequent, along with sparse Xenophyophores (*Syringammina fragilissima*). **45m [3]** Back to burrowing anemone dominated mud, *Phormosoma placenta* is more abundant here. 1h17m. sparse pebbles/cobbles but no major change in epifauna. 1h20-1h24m Stop for imagery of a single *Acanthogorgia armata*. 1h30m no more pebbles/cobbles and *Zoroaster fulgens* (robust morph) becomes abundant. 1h36m *Z. fulgens* no longer abundant. **1h54m [4]** cobbles/pebbles denser than before, occasional *Pliobothrus sp* or barnacles, but not in sufficient numbers to warrant biotope change. Urchins dominate, especially *Phoramrosoma placenta*. **HD VIDEO A ENDS AT 2h01m/11:46am. HD VIDEO B STARTS AT 0m/11:48am.** Continued cobbles/pebbles. 8m. ROV moving left until 9m-18m Sampling two pushcores. 20-22m stop for imagery. **27m [5]** back to mud now dominated by urchins. **HD VIDEO B ENDS AT 30m/12:18pm.**

Physical Data					
Reef (borderline based on density of pebbles/cobbles)	22% reef (borderline)	22% geogenic (borderline)			
	n/a	n/a			
Substrates	<ul style="list-style-type: none"> - mud - cobbles - pebbles 				
Geomorphology/Features	<ul style="list-style-type: none"> - Canyon 				
Annex 1 Types	<ul style="list-style-type: none"> - pebble/cobble field 				
Pressures	<ul style="list-style-type: none"> - 1 x plastic - 1 x net 				

Biological Data			
Number of Species		58spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U.	Name	Size/Growth	SACFOR
585	Acanella arbuscula	L	F
608	Acanthogorgia cf armata	L	R
582	Actiniaria sp 18 (sun)	L	O
605	Actiniaria sp 20	M	R
41	Actiniidae sp (sandBolocera)	L	O
930	Actinopterygii sp 3	M	R
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	R
1120	Anthoptilum sp	L	R
1124	Benthothuria sp	L	O
1077	Caridea (indet)	M	R
2	Ceriantharia	M	F
1069	Ceriantharia sp (giant)	L	O
984	cf Halcampoididae sp	M	R
82	Cirripedia sp	Mass	R
577	Coryphaenoides guentheri	L	O
566	Coryphaenoides rupestris	L	O
1072	Crinoidea sp (10 arm)	L	R
559	Echinidae sp (white)	M	R
279	Echinoidea sp1	L	R
317	Epizoanthus sp 1 (Paguridae Associated)	M	R
214	Gorgonocephalus sp 1	L	O
1166	Guttigadus latifrons	M	R
23	Halcampoididae sp 1	S	R
432	Holothuroidea (cf Laetmogone) (purple)	L	F
1024	Hydrolagus cf mirabilis	L	O
1125	Hygrosoma sp	L	R
249	Lepidion eques	L	O
273	Lophius piscatorius	L	R
11	Majidae sp 1	S	R
1175	Molva macrophthalma	L	O
349	Mora moro	L	O
339	Munida tenuimana	M	R
1003	Nezumia aequalis	L	O
1009	Notacanthidae sp 1 (Notacanthus cheminizii)	L	R
659	Octopodidae (indet)	L	R
340	Ophiuroidae sp 7 (red)	M	R
918	Opisthoteuthis extensa	L	R
205	Paguridae spp	M	R
1046	Pennatula acculeata	L	R
1114	Pennatulacea (indet)	M	O
1059	Pennatulacea sp (cf Kophobelemnidae)	L	R
255	Phelliactis sp 1	L	O
555	Phormosoma placenta	M	F
207	Pliobrothus sp	M	R
552	Polyacanthonotus rissoanus	L	R
1	Porifera encrusting sp 1 (white)	Crust	R
1132	Porifera lamellate lobose (fleshy)	M	R
433	Pseudarchaster sp 1	M	R
652	Rajiformes sp 1 poss Neoraja caerulea	L	R
1118	Sagartiidae sp (wide oral disc)	L	O
537	Spatangus raschi	L	R
440	Synaphobranchus kaupii	L	O
261	Syringammina fragilissima	M	R
1017	Teuthidae (indet)	L	O
446	Trachychynkus sp	L	R
1027	Unknown Hydrozoa/Bryozoa/Annelida	Mass	R
259	Zoarcidae sp 1	M	R
988	Zoroaster fulgens (robust)	L	F

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtMB.Mu.BurAne	(variant of) Burrowing anemone field in Atlantic mid bathyal mud	Anemone aggregations (ICES), Soft-bottom anemone aggregations (ICES subcategory)
(var) M.AtMB.Mu.UrcCom	(Mixed substrate variant) Urchin dominated community on Atlantic mid bathyal mud	
M.AtMB.Mu.EreCor.AcaArb	Acanella arbuscula assemblage on Atlantic mid bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtMB.Mu.UrcCom	Urchin dominated community on Atlantic mid bathyal mud	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtMB.Mu.BurAne 2 Ceriantharia sp, 432 Holothuroidea (purple)	
2	M.AtMB.Mu.EreCor.AcaArb 585 Acanella arbuscula, 2 Ceriantharia sp	
3	(var) M.AtMB.Mu.BurAne 2 Ceriantharia sp, 988 Zoroaser fulgens (robust), 555 Phormosoma placenta	
4	(var) M.AtMB.Mu.UrcCom 555 Phormosoma placenta	
5	M.AtMB.Mu.UrcCom 555 Phormosoma placenta	

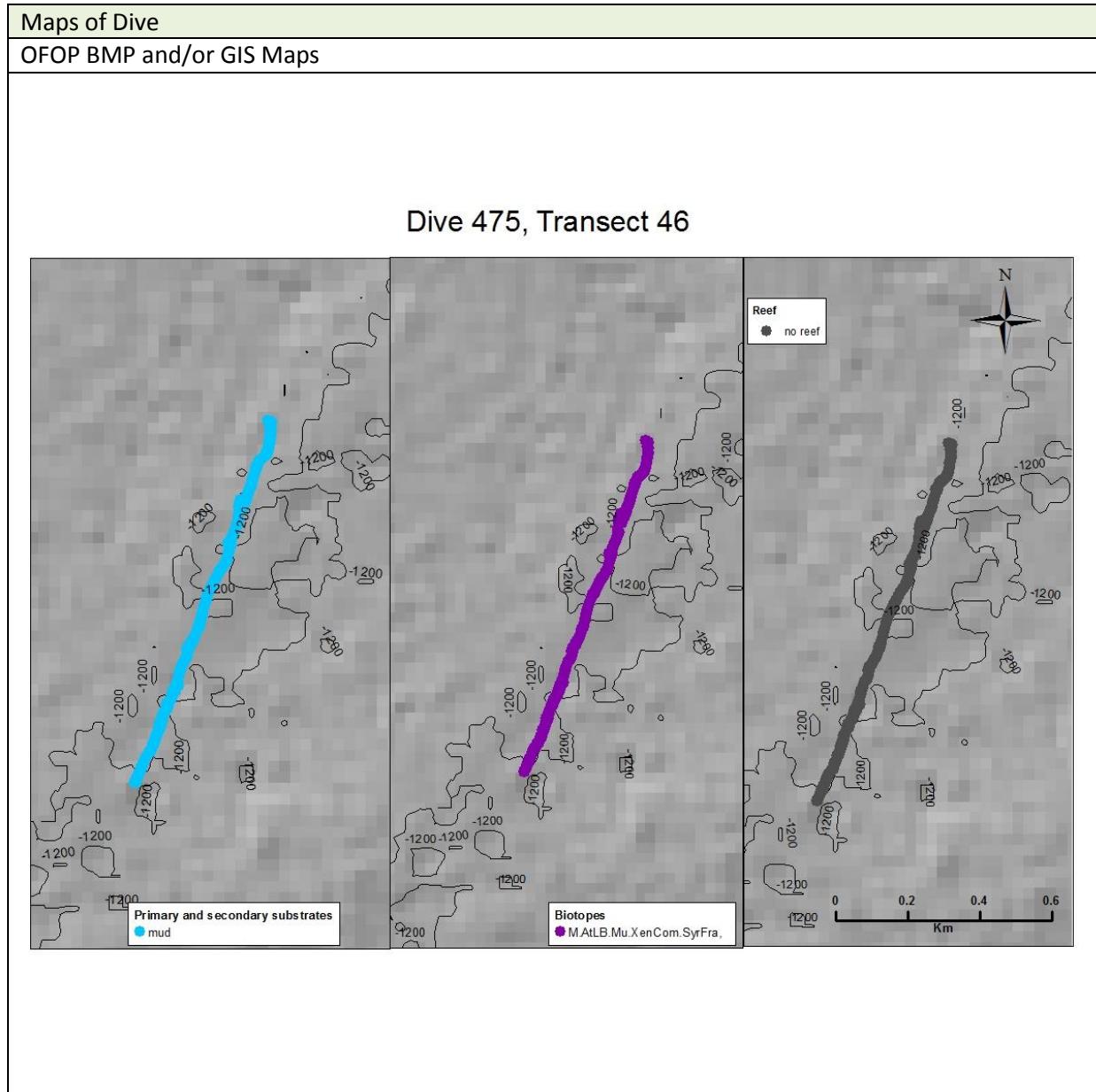
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Anemone aggregations	ICES	
Soft-bottom anemone aggregations	ICES subcategory	
Coral gardens	ICES/OSPAR	
- Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens	ICES subcategory	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - Mixed burrowing anemones, acanella, pebbles/cobbles present in a couple of patches but urchins are dominant 		

DIVE SUMMARY	
DIVE #	TRANSECT #
475	46

	Start	End
Date & Time	13/07/2017 16:29:09	13/07/2017 17:48:56
Latitude/ Longitude	56.21451533, -9.47474433	56.20587283, -9.48184367
Depth	1195.16m	1184.18m
Images	IMG_5990-IMG_6002.JPG	
Samples	2x pushcores	

Location	Northernmost transect, mud slide south of Hebrides Terrace Seamount
Target Features	Predicted sponge field (<i>Pheronema carpenteri</i>)
Depth Range	1184.18-1195.19m (av. 1189.560m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The whole transect occurred over muddy substrate with xenophyophores (*Syringammina fragilissima*) in varying densities. (M.AtLB.Mu.XenCom.SyrFra)

Top R. A Laucoraja sp ray encountered during the dive.

Bottom L. A large Alepocephaliform, possibly *Rouleina attrita*, resting on the bottom.

Bottom R. Cerianthid anemones and *Acanella arbuscula* were also frequently encountered.

Summary Description (habitat transitions noted)

HD VIDEO STARTS AT 0m/16:29:09 [1] The entire transect is spent over muddy substrate with patchy xenophyophore aggregations (*Syringammina fragilissima*). *Acanella arbuscula* and burrowing anemones (Ceriantharia) are also frequently encountered. 6m moving right. 7-9m stopped for imagery of Laucoraja sp. 10-12m tracking and imaging *Hydrolagus mirabilis* juvenile then stopped 19m-21m untwisting tether then re-orienting. 42m-43m ROV backing up then moving right. 1h02-1h03m stopped. 1h06m-1h18m stopped for 2 pushcores (1st attempt fails). 1h19m end of OFOP tracking and off bottom before **END OF HD VIDEO AT 1h25m/17:48:56**.

Physical Data			
Reef (types can be concurrent)	n/a	n/a	
		n/a	n/a
		n/a	n/a
Substrates	- mud		
Geomorphology/Features	- Mud slide		
Annex 1 Types	n/a		
Pressures	- 1 x possible old plastic		

Biological Data							
Number of Species		44spp					
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)							
O.T.U.	Name	Size/Growth	SACFOR				
585	Acanella arbuscula	L	F				
582	Actiniaria sp 18 (sun)	M	R				
605	Actiniaria sp 20	M	R				
930	Actinopterygii sp 3	M	R				
1006	Actinopterygii sp 4	M	R				
1066	Adamsia sp (Paguridae Associated)	M	R				
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	R				
432	Benthogone sp (blue)	L	F				
1077	Caridea (indet)	M	R				
584	Caryophyllia sp 5 (bullseye)	M	R				
1058	Caryophyllidae/Fabellidae (indet)	M	O				
2	Ceriantharia	M	O				
1107	cf Anthoptilum sp	L	R				
1180	Cirrata sp (indet)	L	R				
566	Coryphaenoides rupestris	L	R				
1072	Crinoidea sp (10 arm)	L	R				
1108	Distichoptilum gracile	L	R				
1094	Echinothuroidea sp (purple)	L	O				
1138	Eucaridea sp (redDeep)	M	R				
1056	Flabellum sp	M	R				
1002	Goniasteridae sp	M	R				
1166	Guttigadus latifrons	M	R				
1154	Henricia sp (deep)	M	R				
1179	Holothuroidea sp (pinkDeep)	L	R				
917	Hyalonema sp 1 (shortForm)	L	O				
1024	Hydrolagus cf mirabilis	L	R				
983	Hymenaster membranaceus	L	R				
274	Hymenodiscus coronata/ Brisinda endacacne	L	R				
1067	Laucoraja sp	L	R				
339	Munida tenuimana	M	R				
659	Octopodidae (indet)	L	R				
1059	Pennatulacea sp (cf Kophobelemnidae)	L	R				
555	Phormosoma placenta	M	R				
552	Polyacanthonotus rissoanus	L	O				
433	Pseudarchaster sp 1	M	R				
1079	Rhodaliidae sp	M	R				
1118	Sagartiidae sp (wide oral disc)	L	R				
569	Squaliformes sp	L	R				
198	Stichastrella rosea	M	R				
440	Synaphobranchus kaupii	L	R				
261	Syringammina fragilissima	M	F				
446	Trachychynxus sp	L	R				
1123	Unknown Mud Fluff (Hydro/Foram)	S	O				
1117	UnknownSpring (small)?	M	R				

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Mu.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mud	Mud and sand emergent fauna (ICES)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima	

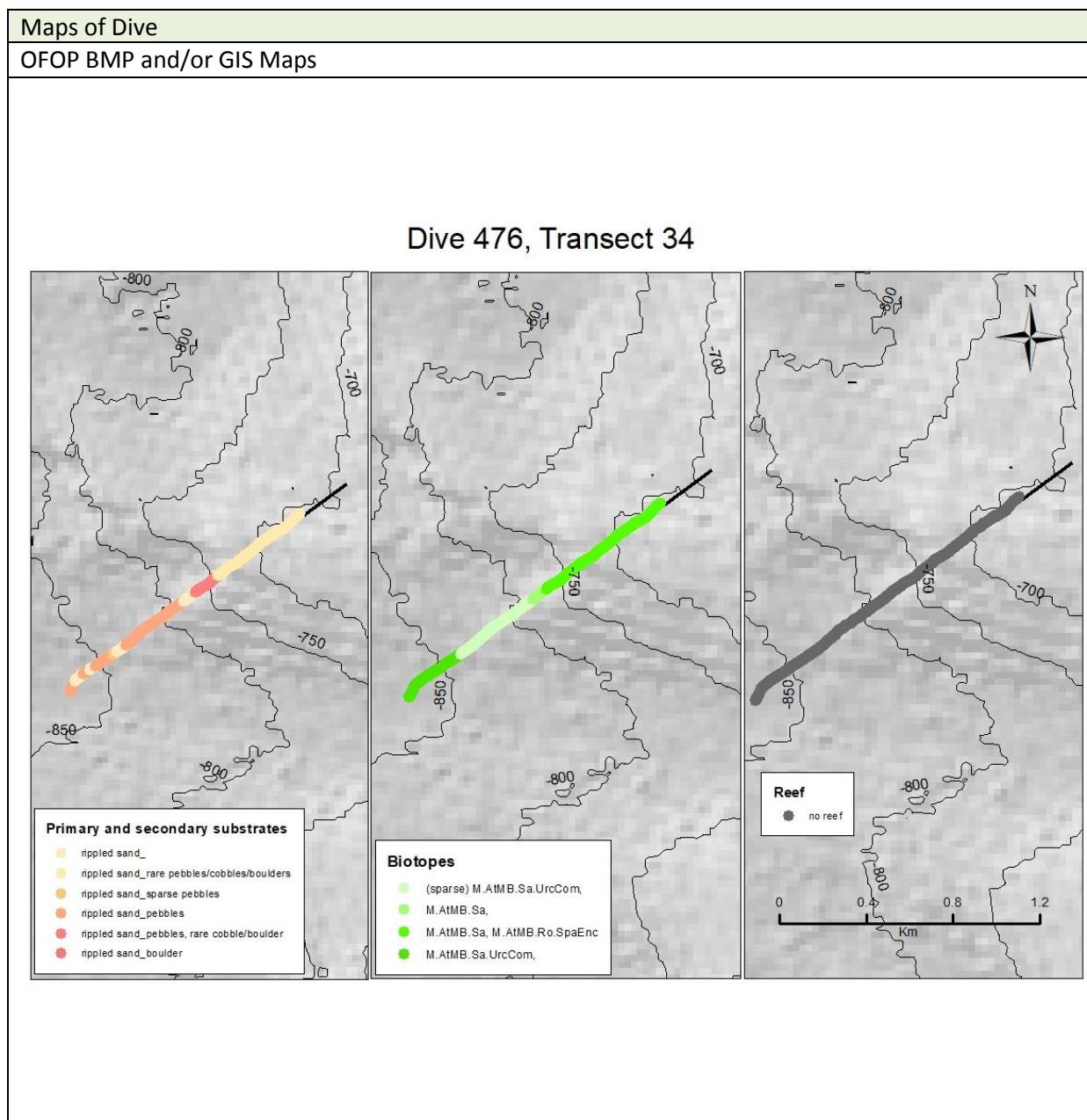
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Mud and sand emergent fauna	ICES	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
- This transect aimed to ground truth models of predicted <i>Pheronema carpenteri</i> aggregations. No <i>P. carpenteri</i> was encountered, but several <i>Hyalonema sp</i> were found, and the two species often co-occur.		

DIVE SUMMARY	
DIVE #	TRANSECT #
476	34

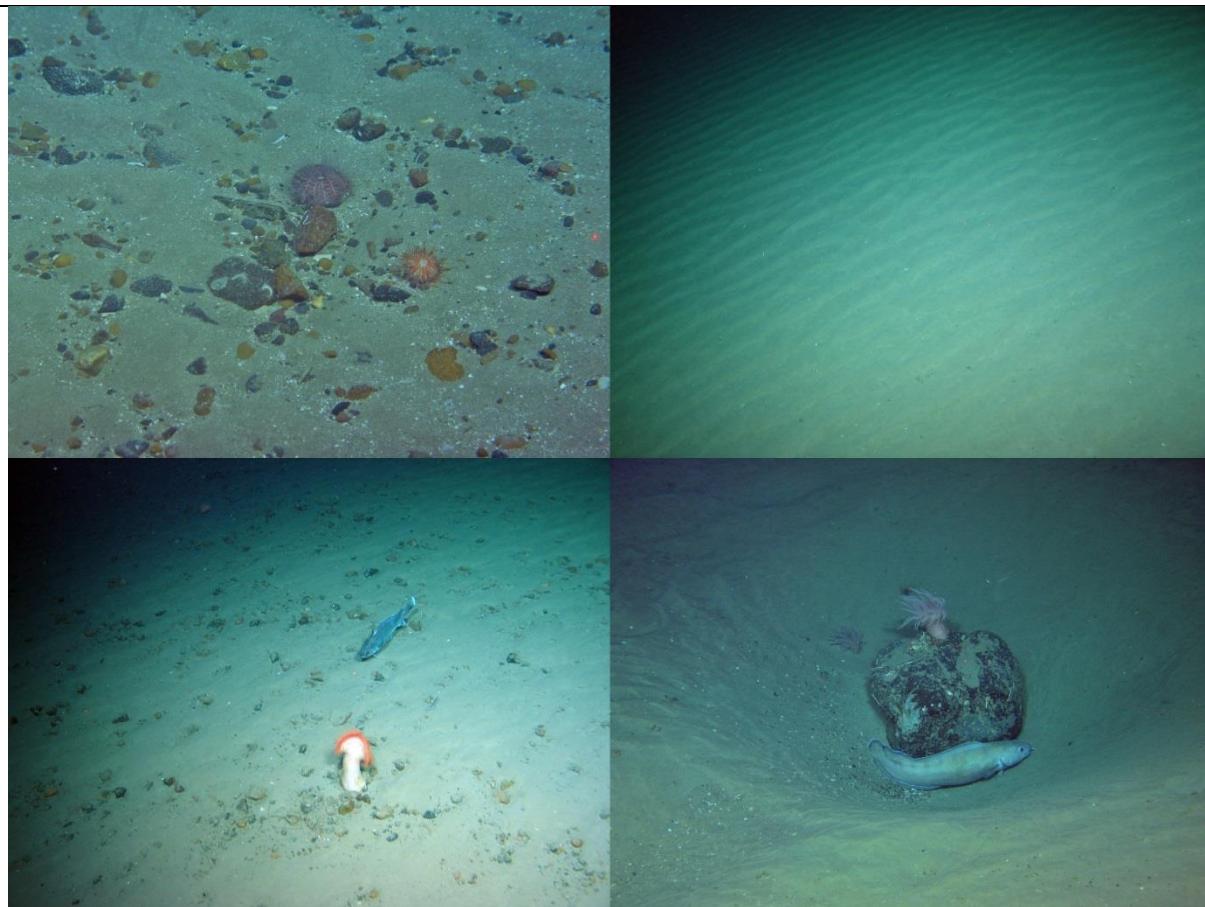
	Start	End
Date & Time	13/07/2017 23:05:15	14/07/2017 01:04:42
Latitude/ Longitude	55.799816, -9.432082	55.80733483, -9.41150967
Depth	851.93	682.58
Images	IMG_6003-IMG_6040.JPG	
Samples	2 x <i>Parastichopus tremulus</i>	

Location	North of C1
Target Features	Canyon, Escarpment
Depth Range	682.16-851.96m (av. 762.250m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The start of the transect displays rippled sand with pebbles and mixed urchins, especially pink/orange echinidae (OTU194, here on the centre right).

Top R. There are extended areas of rippled sand with no dominant epifaunal species and sparse fauna encountered.

Bottom R. Pebbles were patchy throughout the dive. The largest epifauna were anemones such as this *Phelliactis* sp. Although several fish species were encountered, such as this googley-eyed cod (*Mora moro*), they were often solitary.

Bottom L. The latter part of this dive was spent on rippled sand with sparse epifauna, however there were multiple solitary dropstones such as this one, all encountered in a depression, colonised by serpulid worms and at least one *Bolocera tuediae* anemone. One large fish usually accompanied the boulder, here *Brosme brosme*.

Summary Description (habitat transitions noted)

START OF HD VIDEO 0m/23:05:15 [1] Rippled sand and pebbles with mixed urchins (especially pink *Echinidae sp*, OTU194). The ROV stops and starts several times. 3m interesting footage of a *Synaphobranchus kaupii* with a juvenile *Trichiurus lepturus* in its mouth (despite its prey being 2/3 its own body length). 9m Start properly. Pebbles are scattered and occur patchily on the rippled sand (e.g. no pebbles 15-21m, 24-27m, sparse 33-36m, none 36-39m). 15m-19m There are many hermit crabs (*Paguridae spp*) with associated *Epizoanthus sp* in this area. **1h04m [2]** rippled sand with no dominant species and sparse epifauna, mainly encountering only small *S. kaupii* eels. **1h10m** More consistent occurrence of sparsely encrusted pebbles and rare cobbles/boulders are mosaicked with the rippled sand, serpulid worms dominate the hard substrate. 1h15m-1h16m. A dense patch of *Pachycerianthus multiplicatus*. 1h19m fewer pebbles but sparse/rare cobbles/boulders, often as a solitary dropstone in a depression are colonised by serpulids and a *Bolocera tuediae* deeplet anemone. These usually have one large fish associated either a *Brosme brosme* or a *Phycis blennoides*. 1h36m -1h39m and 1h46m-1h49m Stopped to sample *Parastichopus tremulus*. 1h51m - 1h53m moving right to investigate, stop, and image another depression and dropstone. Continue until **END OF HD VIDEO 1h59m/01:04:42**

Physical Data			
Reef (types can be concurrent)	0% reef	n/a	n/a
		n/a	n/a
Substrates	- rippled sand - pebbles - cobbles - boulders		
Geomorphology/Features	Canyon		
Annex 1 Types	n/a		
Pressures	2 x plastic (inc. one fishing glove) 2 x cable/large fishing wire (poss just one encountered twice) 2 x fishing line		

Biological Data				
Number of Species		38 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
499	Actinague richardi	M	O	
4	Actiniaria sp 1	M	O	
976	Actiniaria sp 27	M	R	
41	Actiniidae sp (sandBolocera)	L	O	
930	Actinopterygii sp 3	M	R	
1006	Actinopterygii sp 4	M	R	
12	Bolocera tuediae	L	O	
258	Brosme brosme	L	O	
1129	cf Echinus (deepPinkSpine)	M	R	
1174	cf Hymenaster sp (yellow)	L	R	
254	Chaceon affinis	L	R	
211	Cidaris cidaris	M	R	
113	Colus sp	M	R	
1072	Crinoidea sp (10 arm)	L	R	
1119	Echinidae sp (dark)	M	R	
194	Echinidae sp (pink)	M	O	
445	Echinus sp 1	M	R	
1122	Elpidiidae (indet)	M	R	
317	Epizoanthus sp 1 (Paguridae Associated)	M	O	
227	Helicolenus dactylopterus	L	R	
249	Lepidion eques	L	R	
1019	Merlangius merlangus	L	O	
654	Molva molva	L	R	
349	Mora moro	L	R	
1003	Nezumia aequalis	L	O	
458	Pachycerianthus multiplacatus	M	O	
205	Paguridae spp	M	O	
266	Parastichopus tremulus	L	O	
255	Phelliactis sp 1	L	O	
1020	Phycis blennoides	L	O	
552	Polyacanthonotus rissoanus	L	R	
433	Pseudarchaster sp 1	L	O	
1118	Sagartiidae sp (wide oral disc)	L	R	
1095	Sepiolidae sp	M	R	
106	Serpulidae sp 1	M	R	
198	Stichastrella rosea	L	O	
440	Synaphobranchus kaupii	L	O	
1016	Trichiurus lepturus	L	O	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtMB.Sa	Atlantic mid bathyal sand	
M.AtMB.Sa.UrcCom	Urchin dominated community on Atlantic mid bathyal sand	
M.AtMB.Ro.SpaEnc	Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata	

Biotope progression per habitat transition (# species, dominant/characteristic species)	
1	M.AtMB.Sa.UrcCom 194 Echinidae sp (pink), 206 Paguridae sp/317 Epizoanthus sp 1
2	M.AtMB.Sa, M.AtMB.Ro.SpaEnc 106 Serpulidae sp, 12 Bolocera tuediae, 458 Pachycerianthus multiplacatus

Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
n/a	n/a	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments
<ul style="list-style-type: none">- sand with patches of pebbles, urchins dominate, dropstones in depressions with a Bolocera & a fish each

DIVE SUMMARY	
DIVE #	TRANSECT #
477	47

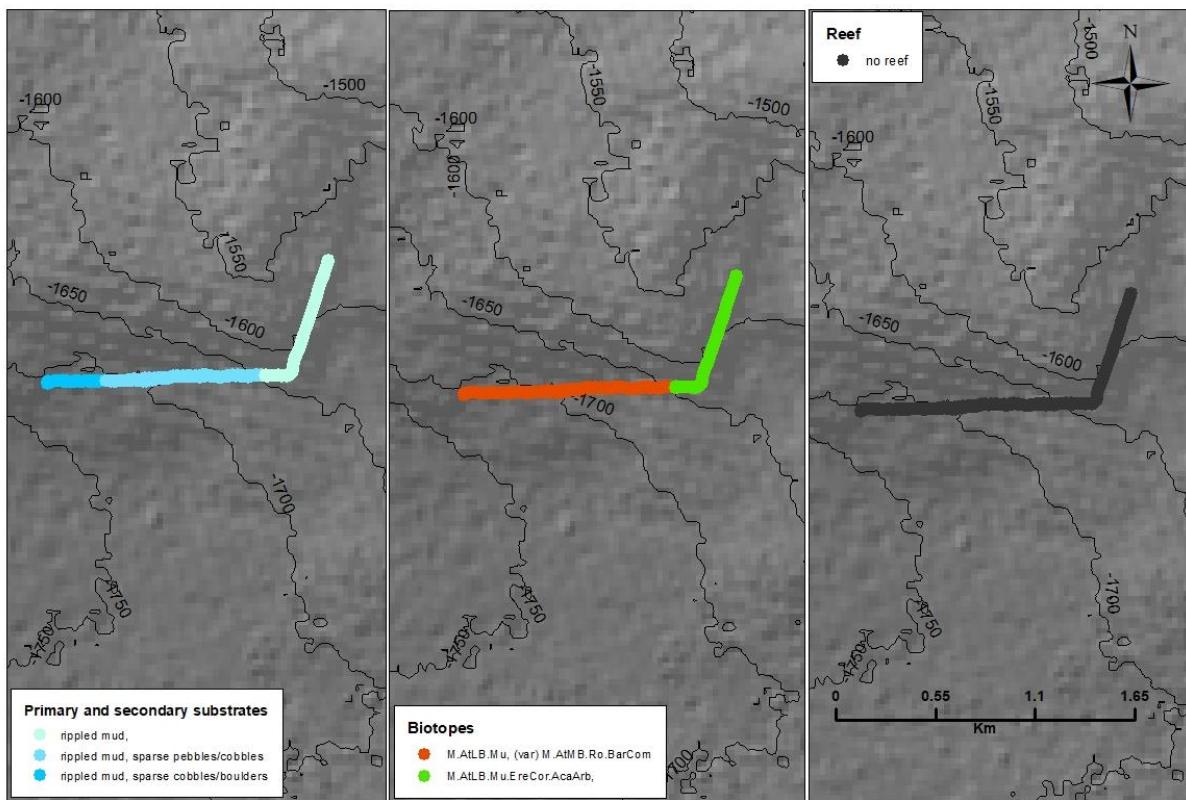
	Start	End
Date & Time	17/07/2017 04:51:45	14/07/2017 07:01:07
Latitude/ Longitude	55.76937233, -9.6996885	55.77423467, -9.67514517
Depth	1699.47	1579.23
Images	IMG_6041-IMG_6049.JPG	
Samples	2 x lamellate fleshy sponges, 1 x Umbellula, 2 x pushcores	

Location	North of C1
Target Features	Unknown
Depth Range	1577.75-1699.47m (av. 1647.297m)

Maps of Dive

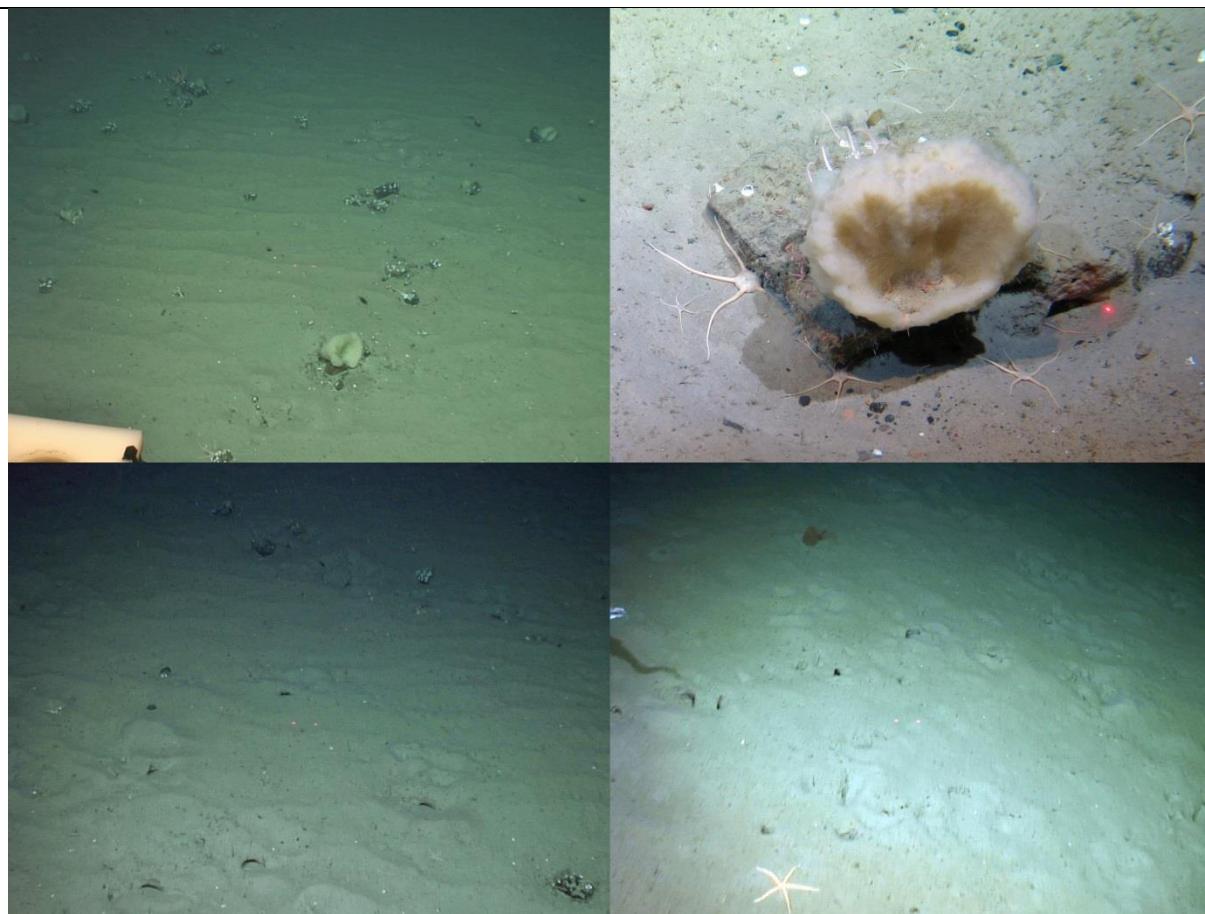
OFOP BMP and/or GIS Maps

Dive 477, Transect 47



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The majority of the dive is spent on rippled sandy mud with pebbles and cobbles colonised by barnacles and fleshy lamellate sponges (OTU1132) (M.AtLB.Mu, (var) M.AtMB.Ro.BarCom)

Top R. Close up on the fleshy lamellate sponges that were frequently encountered. Two of these were sampled and should be better identified in due course. *Ophiomuseum lymani* was also present but not dominant.

Bottom L. Burrows were encountered in varying densities throughout the dive, but no obvious burrowing fauna encountered. It is likely to be a burrowing crustacean that is responsible.

Bottom R. Later on in the dive, while the burrows continued the mud hosted *Acanella arbuscula* bamboo corals and *Zoroaster fulgens* sea stars. (M.AtLB.Mu.EreCor.AcaArb)

Summary Description (habitat transitions noted)

START OF HD VIDEO 0m/04:51:45 [1] The majority of the transect is on slightly rippled (sandy) mud with sparse/patchy cobbles colonised by barnacles and fleshy lamellate sponges (OTU1132), *Ophiomuseum lymani* is also present but not dominant. The area also has varying densities of burrows made by an unknown fauna, likely crustacean. 2m start moving. 10-12m focussed outside of the lightpool so poor views. 15-22m then 27-33m, stopped to sample fleshy lamellate sponges. 55m-1h03m stopped to sample *Umbellula sp.* 1h05m more steeply uphill. **1h21m [2]** start heading down hill, few pebbles, area dominated by rippled or lightly rippled mud with burrows, *Acanella arbuscula* and *Zoroaster fulgens* (slender morph). 1h26m turn to left and head uphill. 1h27-1h28m stopped. 1h58m stopped for two pushcores before **END OF HD VIDEO AT 2h09/07:01:07**

Physical Data			
Reef (types can be concurrent)	n/a	n/a	n/a
		n/a	n/a
			n/a
Substrates	<ul style="list-style-type: none"> - sparse cobbles - rippled mud - sparse pebbles 		
Geomorphology/Features	Canyon		
Annex 1 Types	n/a		
Pressures	n/a		

Biological Data					
Number of Species		44 spp			
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)					
O.T.U.	Name	Size/Growth	SACFOR		
585	Acanella arbuscula	L	F		
605	Actiniaria sp 20	M	R		
1006	Actinopterygii sp 4	M	R		
132	Actinostolidae sp 1	L	O		
1066	Adamsia sp (Paguridae Associate)	M	R		
1074	Alepocephaliformes sp 1 cf Roulei	L	O		
278	Anthomastus grandiflorus	M	R		
471	Asteronyx loveni	M	R		
1077	Caridea (indet)	M	R		
6	Caryophyllia sp	M	R		
2	Ceriantharia	M	R		
1174	cf Hymenaster sp (yellow)	L	R		
82	Cirripedia sp	Mass	O		
1059	Colossendeis sp	L	R		
39	Corallimorphidae sp 1 (dark)	M	R		
577	Coryphaenoides guentheri	L	O		
566	Coryphaenoides rupestris	L	O		
572	Echinothuroidea sp (whiteDeep)	L	O		
1052	Echinus sp (deep, white/pink)	M	R		
1056	Flabellum sp	M	R		
936	Harriotta raleighana	L	R		
1125	Hygrosoma sp	L	O		
1110	Hymenaster cf pellucidus	L	R		
274	Hymenodiscus coronata/ Brisinga	L	O		
249	Lepidion eques	L	R		
1003	Nezumia aequalis	L	R		
551	Ophiomuseum lymani	L	O		
1076	Ophiuroidea (indet)	M	R		
205	Paguridae spp	M	R		
1050	Paramuricea sp	L	O		
1183	Pennatula inflata	L	R		
1083	Pennatulacea sp (thin)	L	O		
255	Phelliactis sp 1	L	R		
555	Phormosoma placenta	M	O		
552	Polyacanthonotus rissoanus	L	R		
263	Porania pulvillus (poss stormi)	L	O		
1132	Porifera lamellate lobose (fleshy)	L	F		
1095	Sepiolidae sp	M	R		
569	Squaliformes sp	L	O		
440	Synaphobranchus kaupii	L	O		
446	Trachychyncus sp	L	O		
581	Umbellula sp	L	O		
291	Zoarcidae sp 2	L	O		
988	Zoroaster fulgens (slender)	L	F		

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Mu	Atlantic lower bathyal mud	
(var) M.AtMB.Ro.BarCom	(lower bathyal variant) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
M.AtLB.Mu.EreCor.AcaArb	Acanella arbuscula assemblage on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)

Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu, (var) M.AtMB.Ro.BarCom 82 Cirripedia, 1132 Porifera lamellate lobose (fleshy), burrows	
2	M.AtLB.Mu.EreCor.AcaArb burrows, 585 Acanella arbuscula, 988 Zoroaster fulgens (slender)	

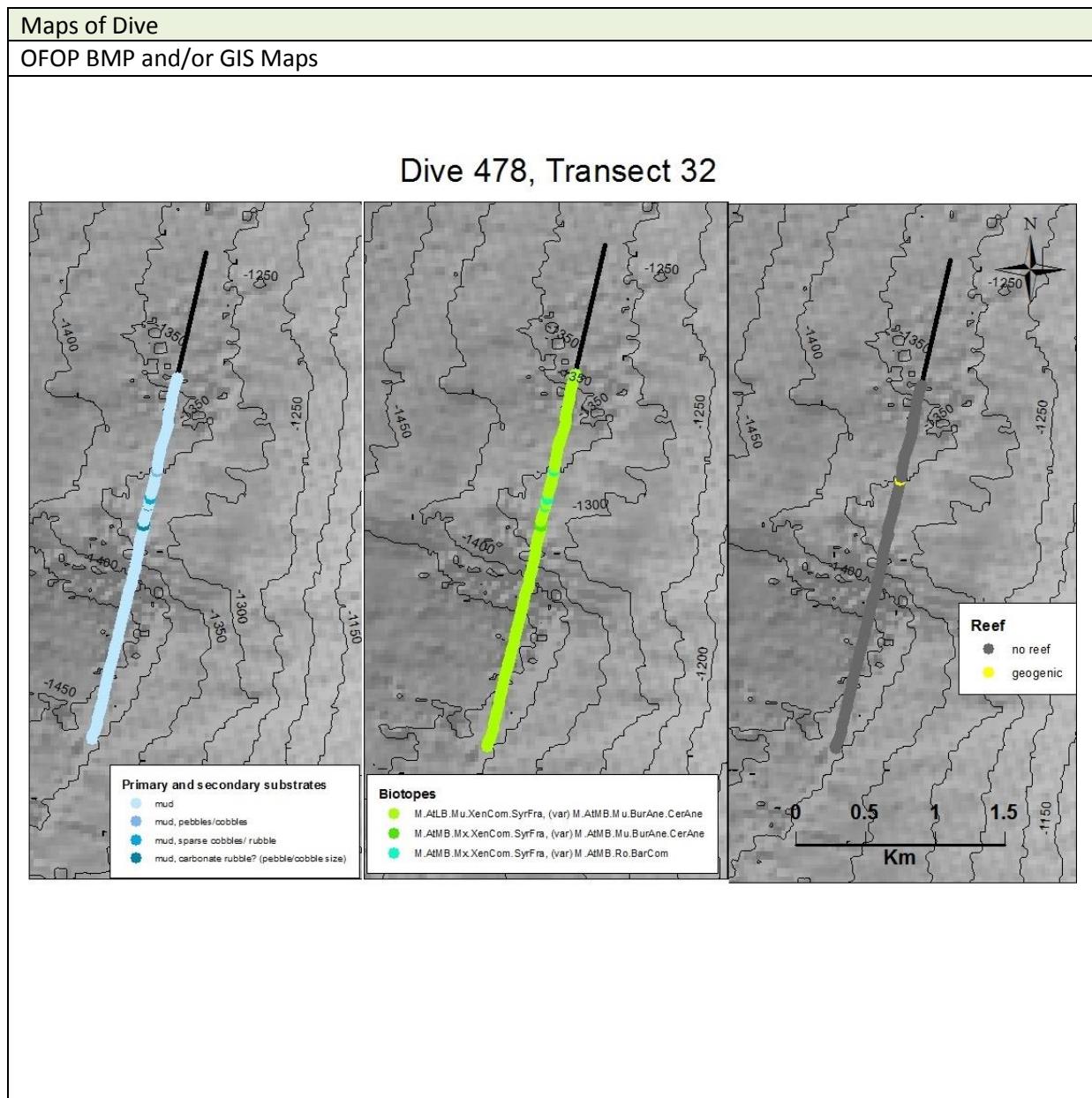
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens - Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens	ICES/OSPAR ICES subcategory	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
- Rippled sand/mud, holes/burrows, lamellate fleshy sponges and barnacles on sparse pebbles. Some Acanella.		

DIVE SUMMARY	
DIVE #	TRANSECT #
478	32

	Start	End
Date & Time	14/07/2017 11:11:48	14/07/2017 14:17:08
Latitude/ Longitude	55.63226017, -9.64690633	55.6550575, -9.63403167
Depth	1368.13	1310.66
Images	IMG_6052-6101	
Samples	2 pushcores	

Location	C1
Target Features	Continental slope (Escarpment targeted but not obviously encountered) [Xenophyophores]
Depth Range	1284.22-1439.65m



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The vast majority of the dive is spent on muddy substrate with Xenophyophores (*Syringammina fragilissima*), cerianthid anemones and many fish. (M.AtLB.Mu.XenCom.SyrFra)

Top R. Some strange rubble patches were encountered, always colonised by this orange anemone (OTU605). Interpreted as mud veneered carbonate rubble, but uncertain.

Bottom L. A small area (0.05% of the dive) consisted of pebbles and cobbles dominated by barnacles.

Bottom R. Many items of plastic litter were encountered (as well as a few bits of discarded fishing gear). There were also many fish encountered throughout the dive – including these cutthroat eels (*Synaphobranchus kaupii*) and 15 threatened orange roughy (*Hoplostethus atlanticus*).

Summary Description (habitat transitions noted)

HD VIDEO A starts at 0m/12:02pm [1]: on a soft sediment downslope (mud) transitioning to flat bottom, with xenophyophores and cerianthid anemones. These are often jointly dominant, although sometimes one or the other dominates (recorded throughout as both mosaicked). 15 threatened orange roughy are encountered in the first hour of the dive in groups of 1-5 individuals. **HD VIDEO A ends at 1h56m/13:08pm** and **HD VIDEO B starts at 0m/13:09pm** still in the first habitat mosaic. **0m [2]:** an area of mixed sediment is encountered, interpreted as carbonate rubble in small pits and mounts with mud veneer (see top R example image). These areas are dominated by an orange anemone (OTU605) and continued xenophyophores. **6m [3]** return to xenophyophore/cerianthid mosaic. **12m [4]:** mixed carbonate rubble (?) and occasional cobbles sparsely distributed on mud host predominantly barnacles, but the xenophyophores are still dominant. **13m [5]:** back to xenophyophores/cerianthids **16m [6]:** sparse pebbles and cobbles with barnacles and xenophyophores before reverting by **16m [7]:** to xenophyophores and cerianthids. Then at **27m [8]:** there is a denser patch of pebbles and cobbles (geogenic reef) mainly colonised by barnacles, but the seabed quickly reverts back to the main biotope mosaic at **28m/13:38pm [9]. HD VIDEO B ends at 1h7m/14:17pm.**

Physical Data

Reef (types can be concurrent)	0.05% reef	0.05% geogenic		
		n/a	n/a	
			n/a	
Substrates	- cobbles - mud - pebbles - rubble (carbonate?)			
Geomorphology/Features	- Canyon			
Annex 1 Types	- cobble/boulder field (cobbles/pebbles only)			
Pressures	- 24 plastic items - 4 fishing lines/ tangles - 2 small fishing nets - 2 fabric			

Biological Data				
Number of Species		55		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size	SACFOR	
585	Acanella arbuscula	L	F	
605	Actiniaria sp 20	S	O	
930	Actinopterygii sp 3	S	R	
1006	Actinopterygii sp 4	M	R	
132	Actinostolidae sp 1	L	R	
594	Anthoptilum grandiflorum	L	R	
188	Araeosoma fenestratum	L	R	
258	Brosme brosme	L	O	
584	Caryophyllia sp 5 (bullseye)	M	R	
1058	Caryophyllidae/Fabellidae (indet)	M	O	
2	Ceriantharia sp	S	O	
984	cf Halcampoididae sp	M	R	
1060	cf Halipteris sp	L	O	
1024	Chimaera opalescens	L	R	
82	Cirripedia sp (some on Neolithodes back)	Mass	O	
1059	Colossendeis sp	L	O	
577	Coryphaenoides guntheri	M	F	
566	Coryphaenoides rupestris	L	C	
1072	Crinoidea sp (10 arm)	L	O	
317	Epizoanthus sp 1 (Paguridae Associated)	M	R	
1056	Flabellum sp	M	R	
174	Gaidropsarus argentatus?	M	R	
1070	Gorgonacea sp (pinkSolenoAssoc)	L	R	
936	Harriotta raleighana	L	R	
208	Henricia sanguinolenta	M	O	
651	Hoplostethus atlanticus	L	O	
1039	Hydrolagus cf affinis	L	O	
653	Hydrolagus cf mirabilis	L	O	
1067	Laucoraja sp	L	R	
339	Munida tenuimana	M	R	
973	Nematocrinus sp 1	M	R	
1063	Neolithodes grimaldii	L	O	
1009	Notacanthidae sp 1	L	O	
659	Octopodidae (indet)	L	R	
551	Ophiomuseum lymani	L	O	
205	Paguridae	M	R	
57	Pandalus borealis	M	R	
1050	Paramuricea sp	L	R	
255	Phelliactis sp 1	L	R	
555	Phormosoma placenta	M	R	
552	Polyacanthonotus_rissoanus	L	O	
800	Porifera encrusting (blue)	Crust	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
1010	Porifera lamellate sp 12 (solen Assoc)	L	O	
433	Pseudarchaster sp 1	M	R	
652	Rajiformes sp 1 poss Neoraja caerulea	L	O	
569	Squaliformes (Etmopteridae?)	L	O	
198	Stichastrella rosea	M	R	
361	Stylaster sp 1	M	R	
440	Synaphobranchus kaupii	L	C	
261	Syringammina fragilissima	M	C	
1017	Teuthida sp 1	S	R	
581	Umbellula sp	L	R	
1073	Unknown annelida or foramanifera	S	O	
532	Unknown sp 26 cf Sabellidae	Mass	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Mu.XenCom.SyrFra/ M.AtLB.Mx.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mud/ mixed sediment	Mud and sand emergent fauna (ICES)
(var) M.AtMB.Mu.BurAne.CerAne	(lower bathyal variant of) Cerianthid anemones and burrowing megafauna in Atlantic mid bathyal mud	Anemone aggregations (ICES), Soft-bottom anemone aggregations (ICES subcategory)
(var) M.AtMB.Ro.BarCom	(lower bathyal variant) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Mu.BurAne.CerAne 261 Syringammina fragilissima, 2 Ceriantharia sp, 605 Actiniaria sp 20	
2	M.AtLB.Mx.XenCom.SyrFra, (var) M.AtMB.Mu.BurAne.CerAne 261 Syringammina fragilissima,	
3	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Mu.BurAne.CerAne 261 Syringammina fragilissima, 2 Ceriantharia sp	
4	M.AtLB.Mx.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp	
5	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Mu.BurAne.CerAne 261 Syringammina fragilissima, 2 Ceriantharia sp	
6	M.AtLB.Mx.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp	
7	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Mu.BurAne.CerAne 261 Syringammina fragilissima, 2 Ceriantharia sp	
8	M.AtLB.Mx.XenCom.SyrFra, (var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 82 Cirripedia sp	
9	M.AtLB.Mu.XenCom.SyrFra, (var) M.AtMB.Mu.BurAne.CerAne 261 Syringammina fragilissima, 2 Ceriantharia sp	

Conservation Targets	
Listed Habitats Encountered	
Name	Authority
Mud and sand emergent fauna Anemone aggregations - Soft-bottom anemone aggregations	ICES ICES ICES subcategory
Listed Species Encountered (Fish, Count)	
Hoplostethus atlanticus	15
	OSPAR/ IUCN

Additional Comments
<ul style="list-style-type: none"> - Xenophyophores, small rubble mounds with orange anemones, small patch of pebbles/cobbles and barnacles, lots of fish. - This transect contained an above average amount of litter, encountered throughout. (qualitatively assessed).

DIVE SUMMARY			
DIVE #	479	TRANSECT #	48

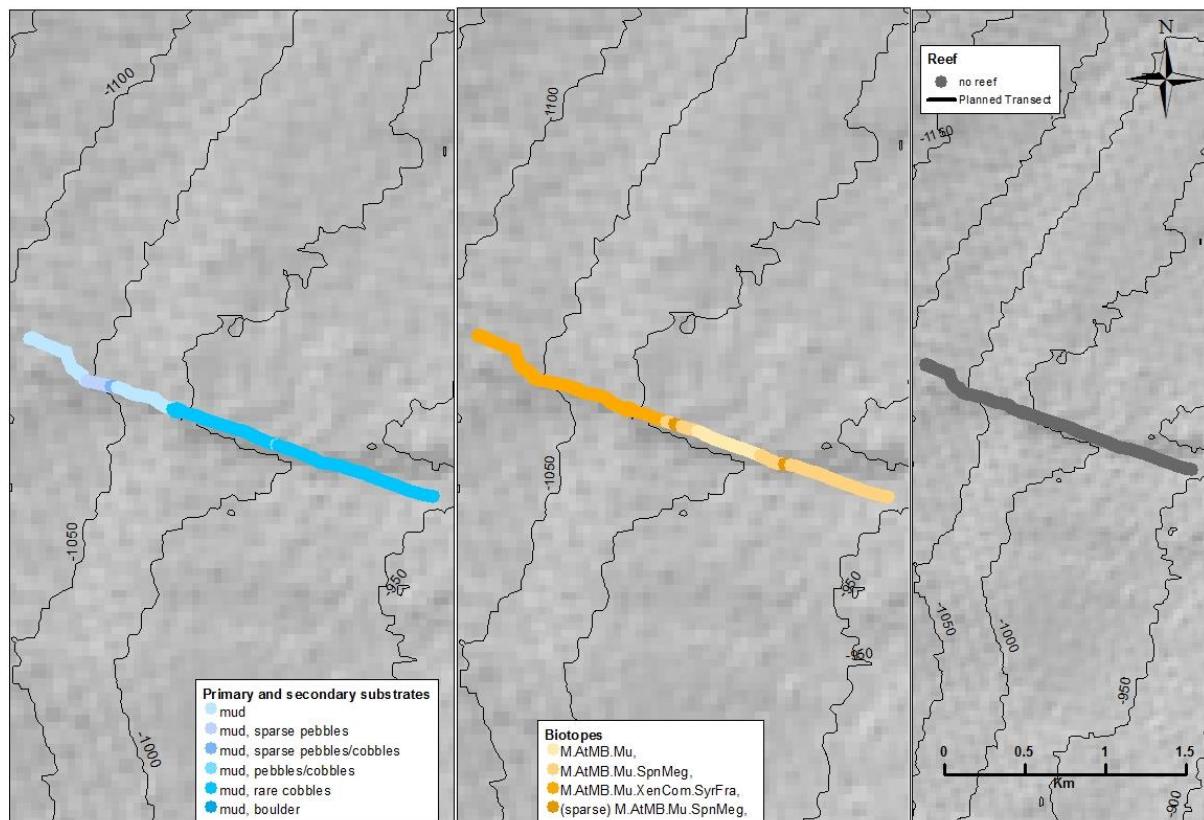
	Start	End
Date & Time	14/07/2017 22:23:20	15/07/2017 00:23:32
Latitude/ Longitude	55.65276367, -9.60503167	55.64582633, -9.57967633
Depth	1058.26	944.46
Images	IMG_6102 – IMG_6194.JPG	
Samples	1 x Halipteris sp	

Location	C1
Target Features	Escarment
Depth Range	944.11-1058.37m (av 996.016m)

Maps of Dive

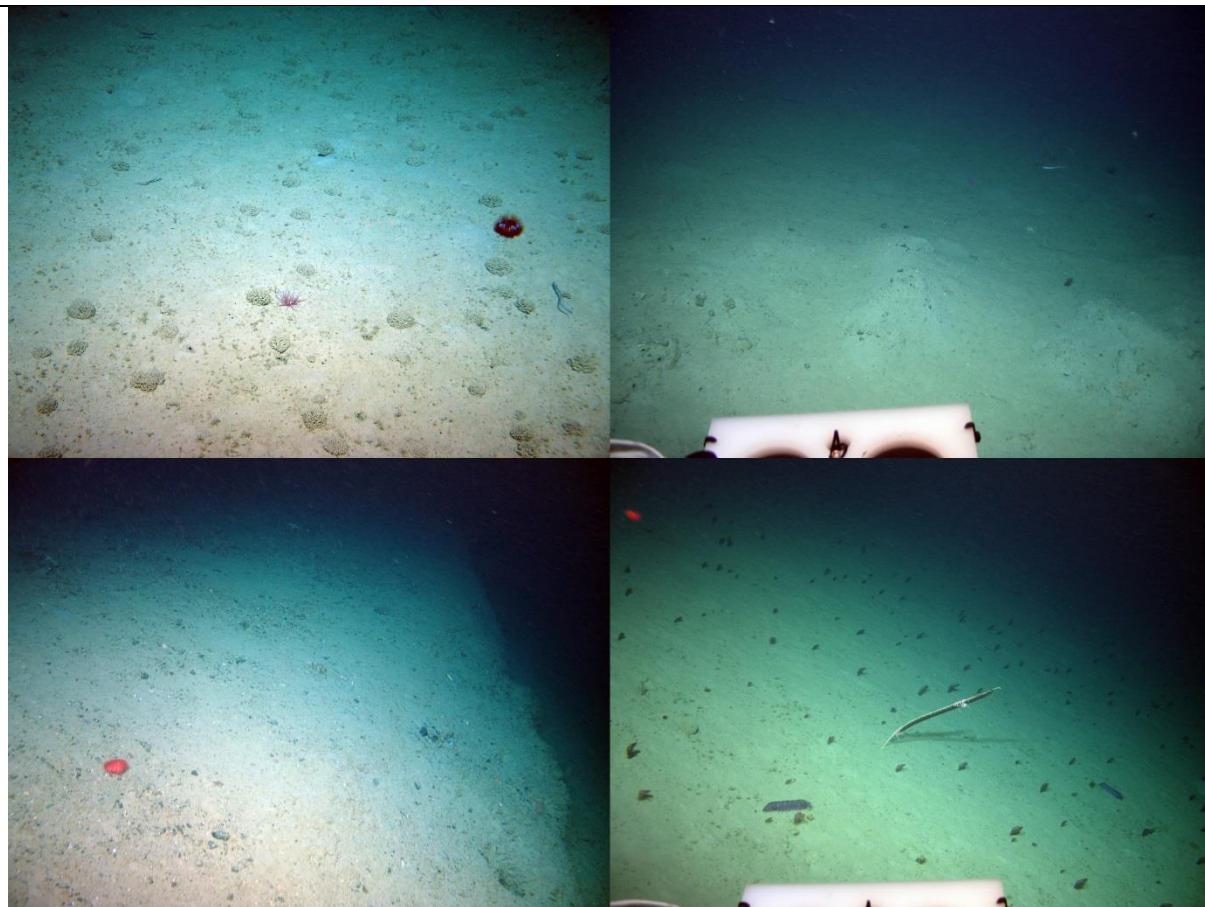
OFOP BMP and/or GIS Maps

Dive 479, Transect 48



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Dense xenophyophore (*Syringammina fragilissima*) aggregations on flat or gently sloping mud occupy the first half of this dive. (seen here with the urchin *Phormosoma placenta*, and a Bolocera-like sand-dwelling anemone from the family Actiniidae (OTU41)). (M.AtMB.Mu.XenCom.SyrFra)

Top R. Periodically small mound features are encountered possibly suggestive of underlying rock formations with a heavy mud veneer.

Bottom L. A ledge feature with scattered pebbles and a small patch of cobbles is the most hard substrate seen on this dive. There is only sparse hard substrate epifauna.

Bottom R. There are huge dense aggregations of (predominantly juvenile) *Pennatula aculeata* sea pens, here shown with a *Halipterus sp* sea pen in the centre and *Benthogone cf rosea* holothurians). (M.AtMB.Mu.SpnMeg)

Summary Description (habitat transitions noted)			
<p>START OF HD VIDEO 0m/ 22:23pm [1] The dive starts on dense xenophyophore aggregations (<i>Syringammina fragilissima</i>) on a mud bottom, with many associated epifaunal species. ROV moves left a couple of times before heading forwards. 12m -14m Brief stop (perhaps for ship movement). 14m ROV moves diagonally right. 20m ROV moving slowly forwards. 23m ROV moving diagonally right. 24m The seabed slopes down to the right with the ROV moving along and up slope. 25m -34m sparse pebbles and cobbles are encountered, often hosting barnacles, but these are too rare to be defined as a mosaicked biotope. 29m ROV encounters a leafscale gulper shark (<i>Centrophorus squamatus</i>). 35m The first of several mound features, assumed to be indicative of rock features with a heavy mud veneer. 47m-54m sampling <i>Halipteris sp</i> sea pen. 56m- END rare cobbles are encountered. 57m the landscape slopes down to the left in front of the ROV. 1h01m landscape slopes to right. 1h04m more mounds indicating rock features beneath the sediment. 1h06m [2] juvenile <i>Pennatula acculeata</i> seapens become the dominant fauna, often dense though this wavers. The similar sizing suggests that a mass colonisation event may have occurred with one cohort of larval seapens settling. 1h07m the edge of a buried carbonate ledge is visible (sufficiently buried to resemble a rope lying on the seafloor). 1h12m more mound features 1h13m [3] the fauna becomes sparse/ with no clear dominant species, the mud substrate continues. 1h14m the landscape slopes down to the right quite steeply and the ROV traverses along slope. 1h19m-1h20m another buried carbonate ledge – stop to image. 1h22m ridge feature with heavy mud draping, small patch of denser pebbles and cobles on the ledge with a few Actinostolid anemones then 1h23m transition back to traversing along the mud slope with sparse pebbles/cobbles. 1h29m [4] The juvenile seapen aggregation begins again, with rare other (mainly fully grown) sea pen species interspersed but vastly dominated by juvenile <i>Pennatula acculeata</i>. 33m stop briefly for imagery. 36m Here seapens continue, but there are also many xenophyophores until 27m where the seapens are dense. 1h44m a single large boulder is encountered, it is sparsely colonised. The seapen aggregation continues until the END OF HD VIDEO at 2h0m / 00:23am.</p>			

Physical Data			
Reef (types can be concurrent)	0% reef	n/a	n/a
		n/a	n/a
			n/a
Substrates	<ul style="list-style-type: none"> - boulders - cobbles - mud - pebbles/cobbles 		
Geomorphology/Features	Canyon interfluve <ul style="list-style-type: none"> - buried carbonate ledge - furrow (sign of trawling?) - mounds (mud draped rock features?) - (mud draped) ridge/ledge 		
Annex 1 Types	n/a		
Pressures	<ul style="list-style-type: none"> - 17 x furrows (signs of bottom trawling?) - 2 x plastic - 9 x fishing lines - 1 x drinks can 		

Biological Data				
Number of Species		59 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/growth	SACFOR	
585	Acanella arbuscula	L	O	
582	Actiniaria sp 18 (sun)	M	R	
605	Actiniaria sp 20	M	R	
930	Actinopterygii sp 3	M	R	
132	Actinostolidae sp 1	L	O	
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	O	
1097	Aphanopis carbo	L	R	
471	Asteronyx loveni	M	R	
432	Benthogone sp	L	O	
1077	Caridea (indet)	M	R	
1048	Centrophorus squamosus	L	R	
2	Ceriantharia	M	O	
984	cf Halcampoididae sp	M	R	
1137	cf Polymastia penicillus	L	R	
653	Chimera opalescens	L	R	
82	Cirripedia sp	Mass	O	
303	Coelorhynchus coelorhynchus	L	R	
120	Cormorphidae sp	M	R	
566	Coryphaenoides rupestris	L	O	
1072	Crinoidea sp (10 arm)	L	O	
1108	Distichoptilum gracile	L	R	
279	Echinoidea sp1	L	O	
317	Epizoanthus sp 1 (Paguridae Associated)	M	R	
1138	Eucaridea sp (redDeep)	M	R	
214	Gorgonocephalus sp 1	L	R	
622	Halipterus cf finmarchica	L	O	
1024	Hydrolagus cf mirabilis	L	O	
249	Lepidion eques	L	R	
273	Lophius piscatorius	L	R	
654	Molva molva	L	R	
349	Mora moro	L	O	
339	Munida tenuimana	M	O	
1003	Nezumia aequalis	L	O	
458	Pachycerianthus multiplacatus	M	R	
205	Paguridae spp	M	R	
1050	Paramuricea sp	L	O	
1046	Pennatula acculeata	L	C	
1114	Pennatulacea (indet)	M	R	
1059	Pennatulacea sp (cf Kophobelemnidae)	L	O	
255	Phelliactis sp 1	L	O	
555	Phormosoma placenta	M	O	
1020	Phycis blennoides	L	R	
207	Pliobrothus sp	M	O	
800	Porifera encrusting (blue)	Crust	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
433	Pseudarchaster sp 1	M	O	
1118	Sagartiidae sp (wide oral disc)	L	F	
1095	Sepiolidae sp	M	R	
106	Serpulidae sp 1	M	R	
1135	Siphonophora sp (indet)	L	O	
198	Stichastrella rosea	L	R	
440	Synaphobranchus kaupii	L	F	
261	Syringammina fragilissima	M	C	
446	Trachychyncus sp	L	O	
1016	Trichiurus lepturus	L	R	
581	Umbellula sp	L	O	
1123	Unknown mud fluff	S	O	
199	Velatida sp 1	M	R	
988	Zoroaster fulgens (robust)	L	O	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtMB.Mu	Atlantic mid bathyal mud	
M.AtMB.Mu.SpnMeg	Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
M.AtMB.Mu.XenCom.SyrFra	Syringammina fragilissima field on Atlantic mid bathyal mud	Mud and sand emergent fauna (ICES)

Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtMB.Mu.XenCom.SyrFra	
	261 Syringammina fragilissima	
2	M.AtMB.Mu.SpnMeg	
	1046 Pennatula acculeata	
3	M.AtMB.Mu	
	1123 Unknown mud "fluff"	
4	M.AtMB.Mu.SpnMeg	
	1046 Pennatula acculeata	

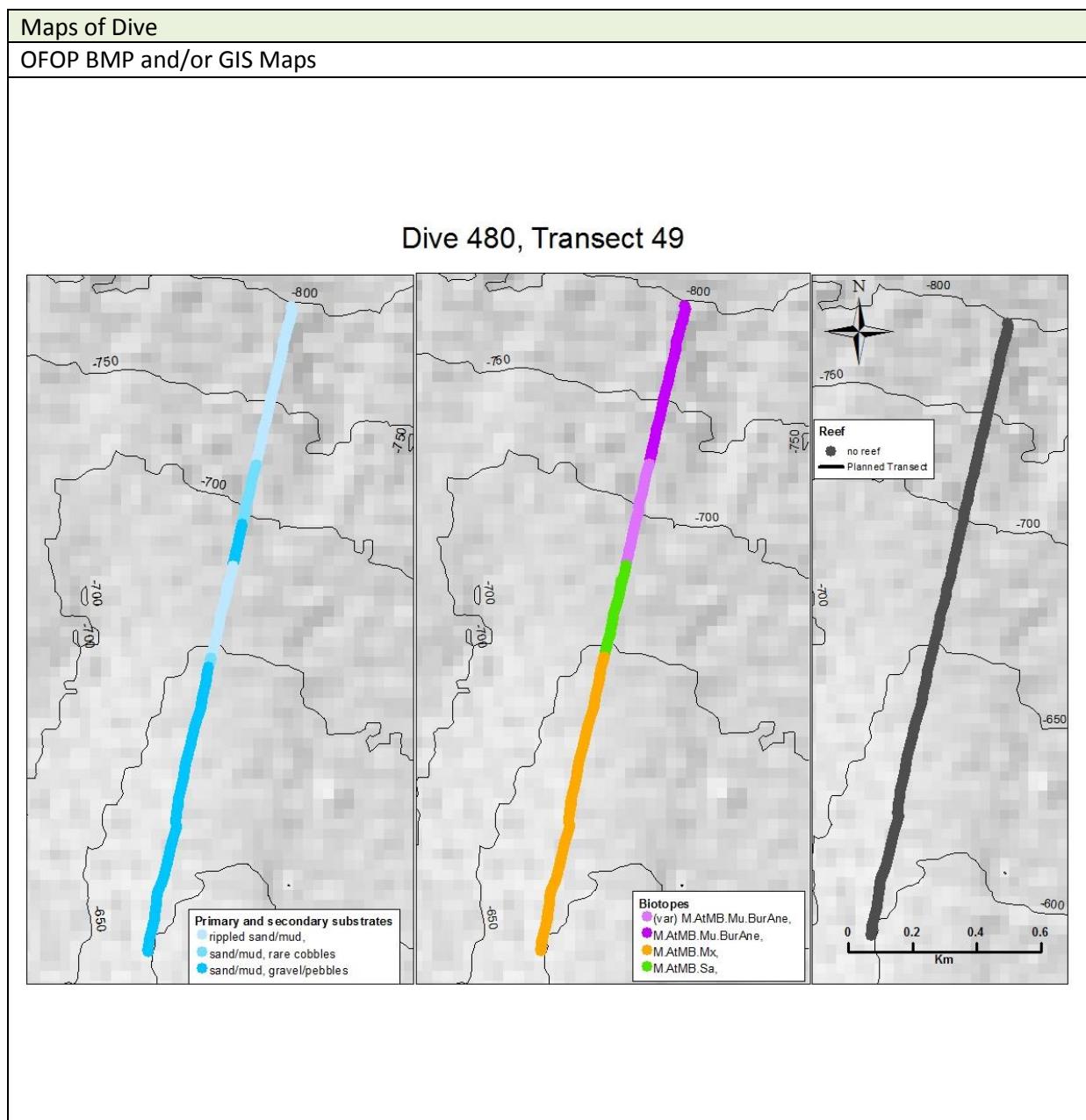
Conservation Targets		
Listed Habitats Encountered		
Name Authority		
Sea-pen and burrowing megafauna communities		OSPAR
Seapen fields		ICES
Mud and sand emergent fauna		ICES
Listed Species Encountered (Fish, Count)		
Centrophorus squamosus	1	IUCN/ OSPAR

Additional Comments		
- Dense xenophyophores, heavily mud veneered ledges and slopes, and dense seapens (Pennatula acculeata)		
- The many furrows seen on this dive may be indicative of historic trawl activity, but if they are they seem often to be still surrounded by the dominant fauna (xenophyophores/ sea pens), suggesting that there has been some recovery of the seabed afterwards. It may be that these marks have a different origin, but if not then this may be a good sign for these epifaunal types. However we have no idea how old these marks are either. This may be worth looking into in the future.		

DIVE SUMMARY	
DIVE #	TRANSECT #
480	T49

	Start	End
Date & Time	15/07/2017 02:51:52	15/07/2017 04:48:28
Latitude/ Longitude	55.65270567, -9.50526133	55.635942, -9.51434317
Depth	790.78	584.29
Images	IMG_6195-IMG_6199.JPG	
Samples	2 x pushcores	

Location	East of C1
Target Features	Lophelia reef model groundtruthing
Depth Range	583.76-790.91m (av. 665.849m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The rippled sand/mud at the start of the transect hosts abundant *cf Halcampoididae* sp and sediment dwelling *Bolocera*-like anemones (OTU41). (M.AtMB.Mu.BurAne)

Top R. The burrowing anemones are particularly abundant at the start of the dive. (M.AtMB.Mu.BurAne)

Bottom L. The mixed sediment encountered at a couple of points along the transect. These areas either host *Pachycerianthus multiplicatus* as the dominant species (anther burrowing anemone), or sparse epifauna with no dominant species.

Bottom R. At least ten furrows indicating likely trawling activity were encountered on this dive. (M.AtMB.Sa)

Summary Description (habitat transitions noted)

START OF HD VIDEO 0m/02:51:52 [1] Sand/mud sediment with burrowing anemones, dominated by abundant cf *Halcampoididae* sp (OTU984) and large *Bolocera*-like sediment dwelling anemones (Actiniidae sp, OTU41). The sea pen *Virgularia mirabilis* is also encountered several times. 21m anemones continue but are sparser. 27m start encountering burrows, likely dug by crustaceans. 29m the first of multiple trawl marks. **33m [2]** rare cobbles and then gravel/pebbles are mixed with the soft sediment, *Pachycerianthus multiplacatus* is now dominant. **49m [3]** return to sand/mud with no obvious dominant fauna although epifauna is occasionally encountered (e.g. *P. multiplacatus*, asteroids, *Parastichopus tremulus*). **1h02m [4]** sediment again has some cobbles and gravel/pebble constituent, still no dominant fauna. 1h49m stopped to sample two pushcores before **END OF HD VIDEO AT 1h56m/04:48:28.**

Physical Data			
Reef (types can be concurrent)	n/a	n/a	
		n/a	n/a
			n/a
Substrates	<ul style="list-style-type: none"> - cobbles - gravel - pebbles - sand/mud 		
Geomorphology/Features	Continental Slope		
Annex 1 Types	n/a		
Pressures	10 x furrows/trawl marks 1 x fishing line (fine)		

Biological Data					
Number of Species		35 spp			
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)					
O.T.U.	Name	Size/Growth	SACFOR		
499	Actinaugae richardi	M	O		
41	Actiniidae sp (sandBolocera)	L	F		
1006	Actinopterygi sp 4	M	R		
1066	Adamsia sp (Paguridae Associated)	M	R		
471	Asteronyx loveni	M	R		
12	Bolocera tuediae	L	R		
1077	Caridea (indet)	M	R		
2	Ceriantharia	M	O		
1188	cf Argentina sp	L	R		
984	cf Halcampoididae sp	M	F		
254	Chaceon affinis?	L	O		
265	Chimaera monstrosa	L	O		
303	Coelorhynchus coelorrhynchus	L	O		
120	Corymorphidae sp	M	R		
1119	Echinidae sp (dark)	M	R		
194	Echinidae sp (pink)	M	R		
317	Epizoanthus sp 1 (Paguridae Associated)	M	O		
227	Helicolenus dactylopterus	L	O		
249	Lepidion eques	L	O		
273	Lophius piscatorius	L	O		
448	Luidia sarsi	L	R		
654	Molva molva	L	R		
152	Munnopsurus giganteus	M	R		
1026	Mysida (indet)	S	R		
1003	Nezumia aequalis	L	O		
659	Octopodidae (indet)	L	R		
458	Pachycerianthus multiplicatus	M	O		
205	Paguridae spp	M	O		
266	Parastichopus tremulus	L	O		
1020	Phycis blennoides	L	O		
1118	Sagartiidae sp (wide oral disc)	L	O		
106	Serpulidae sp 1	M	R		
198	Stichastrella rosea	M	R		
440	Synaphobranchus kaupii	L	F		
385	Virgularia mirabilis	L	O		
Biotope List (Marine Habitat Classification for Britain & Ireland)					
Code	Name	Listed			
M.AtMB.Mu.BurAne	Burrowing anemone field in Atlantic mid bathyal mud	Anemone aggregations: Soft-bottom anemone aggregations			
M.AtMB.Sa	Atlantic mid bathyal sand				
(var) M.AtMB.Mu.BurAne	(mixed sediment variant) Burrowing anemone field in Atlantic mid bathyal mud				
M.AtMB.Mx	Atlantic mid bathyal mixed sediment				
Biotope progression per habitat transition (# species, dominant/characteristic species)					
1	M.AtMB.Mu.BurAne				
	984 cf Halcampoididae sp, 41 Actiniidae sp (sandBolocera)				
2	(var) M.AtMB.Mu.BurAne				
	458 Pachycerianthus multiplicatus				
3	M.AtMB.Sa				
	No dominant spp.				

4	M.AtMB.Mx
	No dominant spp.

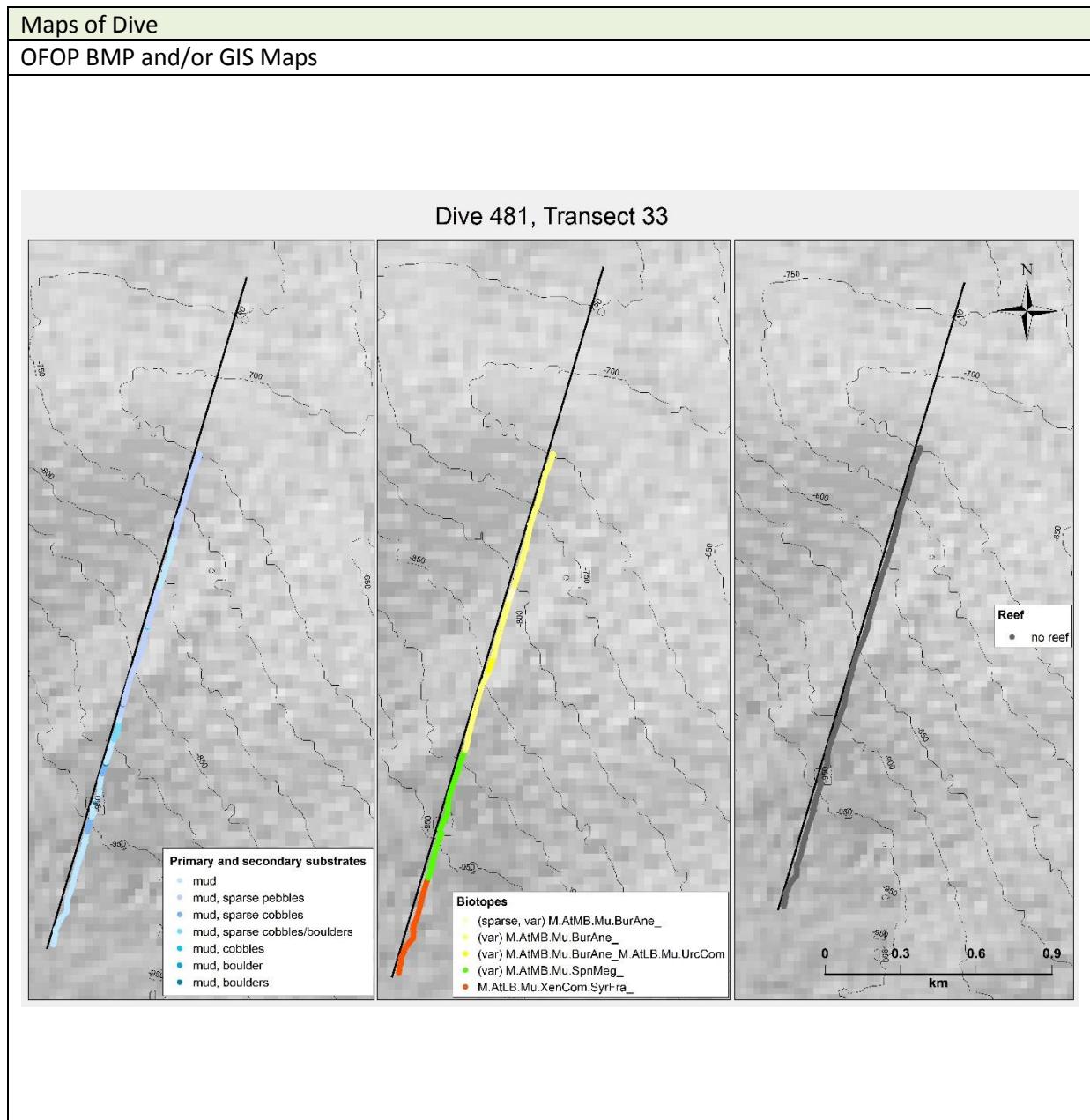
Conservation Targets	
Listed Habitats Encountered	
Name	Authority
Anemone aggregations - Soft-bottom anemone aggregations	ICES ICES subcategory
Listed Species Encountered (Fish, Count)	
n/a	n/a

Additional Comments	
	- Rippled sand/mud with burrowing anemones, small area with mixed substrate (gravel/pebbles) and trawl marks

DIVE SUMMARY	
DIVE #	TRANSECT #
481	33

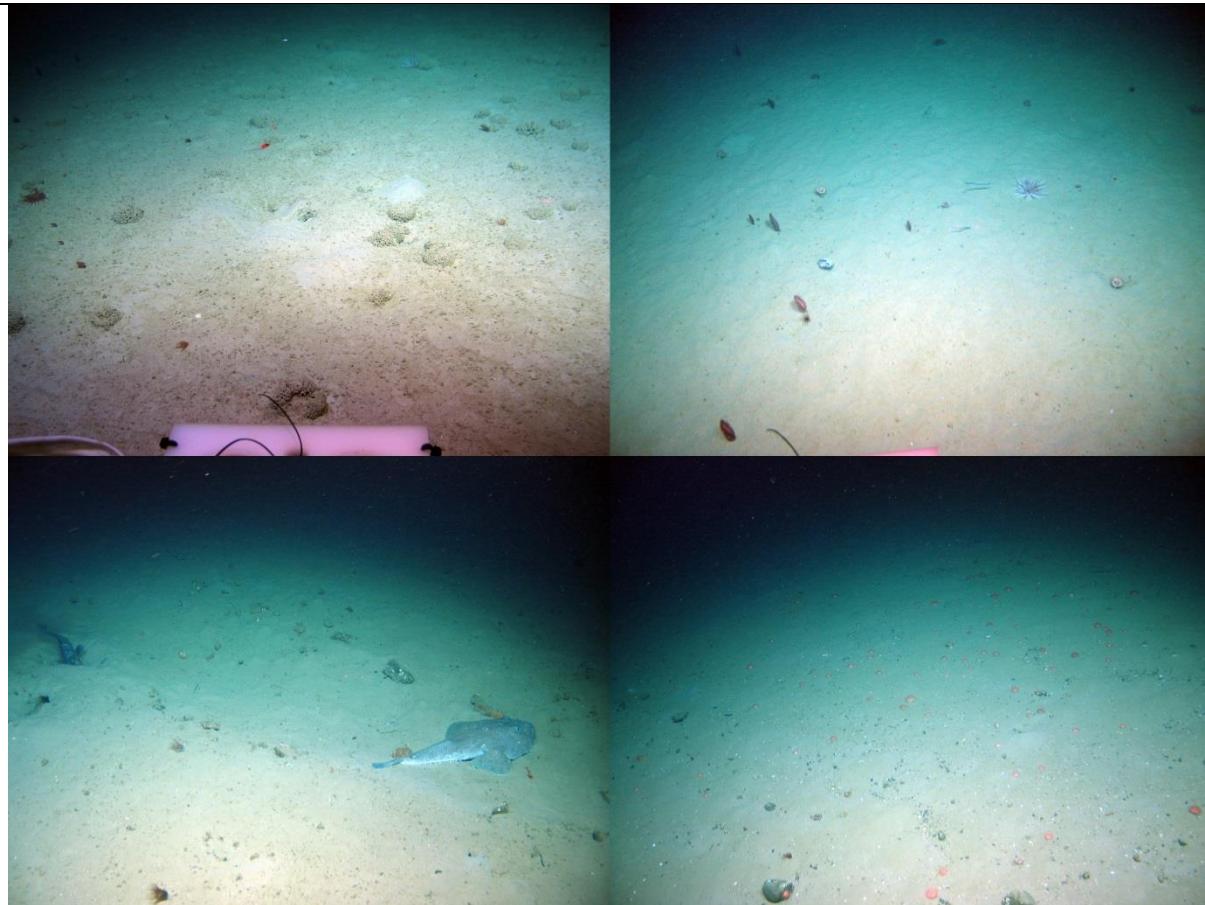
	Start	End
Date & Time	15/07/2017 07:24:29	15/07/2017 09:39:00
Latitude/ Longitude	55.56454217, -9.58871417	55.58253483, -9.57654767
Depth	964.82	684.47
Images	IMG_6203-IMG_6321.JPG	
Samples	1 x sea pen, 1 x pushcore	

Location	C1
Target Features	Canyon, Escarpment
Depth Range	683.66-965.07m (av. 843.992m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The start of the transect is occupied by dense fields of Xenophyophores (*Syringammina fragilissima*) with burrowing anemones, sea pens and echinoderms. (M.AtLB.Mu.XenCom.SyrFra).

Top R. Sea pens dominated for a period, especially *Pennatula aculeata*, together with mixed burrowing anemones which themselves were the dominant community at times. Cerianthids, Actinidae sp (OTU41), and *Actinaugue richardi* (all present in this image) were all abundant for the majority of the dive, and were sometimes amongst the dominant fauna. ((var) M.AtMB.Mu.SpnMeg)

Bottom L. One of at least 24 trawl marks, with a monkfish (*Lophius piscatorius*) which were frequently encountered.

Bottom R. Small pink echinoid aggregations were patchy in areas of mud with scattered pebbles, mosaicked across a burrowing anemone community. ((var) M.AtMB.Mu.BurAne, M.AtLB.Mu.UrcCom)

Summary Description (habitat transitions noted)			
START OF HD VIDEO 0m/07:24:29 [1] mud and fairly dense xenophyophores (<i>Syringammina fragilissima</i>), ROV comes off bottom and turns disturbing sediment, view obscured or partial. 2m moving forward partial views due to low vis. 5m vis clears up. 24m [2] continued mud, now sea pens dominate (<i>Pennatula acculeata</i>) amognst other epifauna, especially burrowing anemones and urchins. Periodic sparse cobbles or boulders, not enough to form a separate biotope. 55-56m stopped. 1h00m [3] Burrowing anemones become dominant, mixed cerianthids, <i>Actinaugue richardi</i> and others. Mud with scattered/sparse pebbles/cobbles. many trawl marks. 1h17m [4] Aggregations of pink echinoids (OTU194) mosaic with continued burrowing anemones. 1h20m [5] Burrowing anemones, now with more <i>Actinidae sp</i> (OTU41) along with Ceriantharia, 1h33-1h36m sparse fauna and trawl marks. 1h36m continued burrowing anemones, hermit crabs with associated <i>Epizoanthus sp</i> abundant. 1h46m scattered pebbles and more <i>Pachycerianthus multiplicata</i> , many trawl marks. 2h06m Stopped for pushcore sampling until END OF HD VIDEO 2h41m/09:39:00			

Physical Data			
Reef (types can be concurrent)	n/a	n/a	n/a
Substrates	- boulders - cobbles - mud - pebbles	n/a	n/a
Geomorphology/Features	Canyon		
Annex 1 Types	n/a		
Pressures	- 24 x trawl marks - 1 x fishing line - 1 x rope		

Biological Data				
Number of Species		54spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	R	
499	Actinaugue richardi	M	F	
582	Actiniaria sp 18 (sun)	L	O	
605	Actiniaria sp 20	M	R	
41	Actiniidae sp (sandBolocera)	L	F	
1006	Actinopterygii sp 4	M	R	
1097	Aphanopis carbo	L	O	
471	Asteronyx loveni	M	R	
235	Bathynectes sp	L	R	
12	Bolocera tuediae	L	R	
267	Bonellia viridis	M	R	
1048	Centrophorus squamosus	L	R	
2	Ceriantharia	M	C	
1129	cf Echinus (deepPinkSpine)	M	R	
984	cf Halcampoididae sp	M	R	
432	cf Laetmogonidae sp (pink/white)	M	R	
120	Corymorphidae sp	M	R	
1072	Crinoidea sp (10 arm)	L	O	
1108	Distichoptilum gracile	L	O	
1119	Echinidae sp (dark)	M	O	
194	Echinidae sp (pink)	M	F	
279	Echinoidea sp1	L	R	
317	Epizoanthus sp 1 (Paguridae Associated)	M	O	
1056	Flabellum sp	M	R	
622	Halipteris cf finmarchica	L	R	
227	Helicolenus dactylopterus	L	R	
432	Holothuroidea (cf Laetmogone) (blue)	L	O	
1098	Hormathiidae sp	L	O	
1024	Hydrolagus cf mirabilis	L	O	
1067	Laucoraja sp	L	R	
249	Lepidion eques	L	O	
273	Lophius piscatorius	L	O	
349	Mora moro	L	R	
1003	Nezumia aequalis	L	O	
1076	Ophiuroidae (indet)	S	R	
458	Pachycerianthus multiplacatus	M	F	
205	Paguridae spp	M	O	
1046	Pennatula acculeata	L	C	
1183	Pennatula inflata	L	R	
1083	Pennatulacea sp (thin)	L	R	
255	Phelliactis sp 1	L	O	
555	Phormosoma placenta	M	O	
1020	Phycis blennoides	L	O	
552	Polyacanthonotus rissoanus	L	R	
433	Pseudarchaster sp 1	M	O	
1044	Radicipes cf gracilis	L	R	
1118	Sagartiidae sp (wide oral disc)	L	O	
1134	Scyphozoa sp (indet)	M	R	
1095	Sepiolidae sp	M	R	
106	Serpulidae sp 1	M	R	
537	Spatangus raschi	L	O	
440	Synaphobranchus kaupii	L	O	
261	Syringammina fragilissima	M	C	
581	Umbellula sp	L	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtMB.Mu.BurAne	(lower bathyal variant) Burrowing anemone field in Atlantic mid bathyal mud	Anemone aggregations (ICES), Soft-bottom anemone aggregations (ICES subcategory)
(var) M.AtMB.Mu.SpnMeg	(lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
M.AtLB.Mu.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mud	Mud and sand emergent fauna (ICES)
M.AtLB.Mu.UrcCom	Urchin dominated community on Atlantic lower bathyal mud	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima	
2	(var) M.AtMB.Mu.SpnMeg 1046 Pennatula acculeata	
3	(var) M.AtMB.Mu.BurAne 2 Ceriantharia, 499 Actinaugue richardi	
4	(var) M.AtMB.Mu.BurAne, M.AtLB.Mu.UrcCom 2 Ceriantharia, 194 Echinidae sp (pink)	
5	(var) M.AtMB.Mu.BurAne 2 Ceriantharia, 41 Actiniidae sp (sandBolocera), 205 Paguridae sp/317 Epizoanthus sp, 458 Pachycerianthus multiplacata	

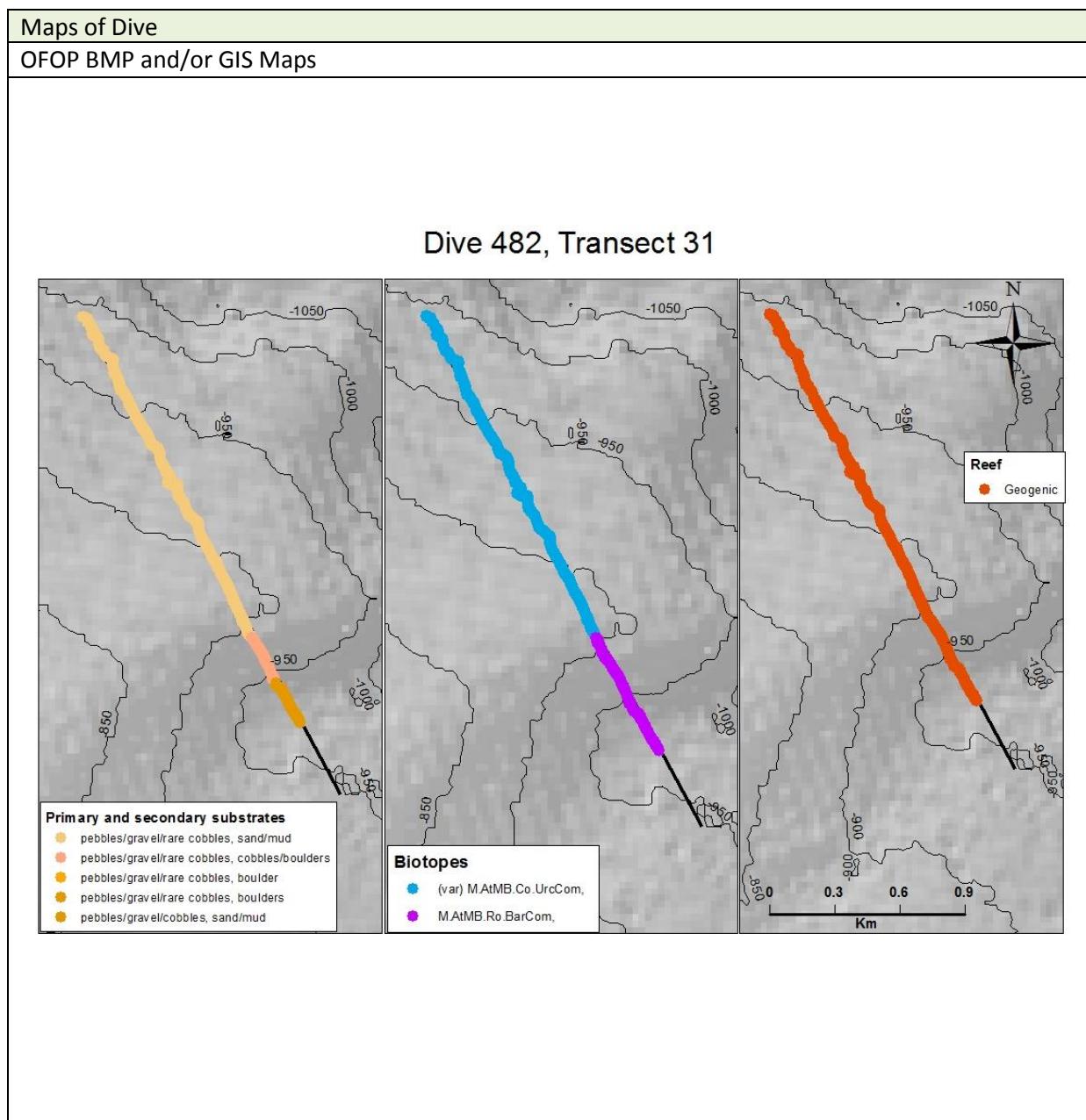
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Mud and sand emergent fauna		ICES
Sea-pen and burrowing megafauna communities		OSPAR
Seapen fields		ICES
Listed Species Encountered (Fish, Count)		
<i>Centrophorus squamatus</i>	1	IUCN/ OSPAR

Additional Comments		
- Dense xenophyophores, areas of sea pens and burrowing anemones or echinoids. Many trawl marks.		

DIVE SUMMARY	
DIVE #	TRANSECT #
482	31

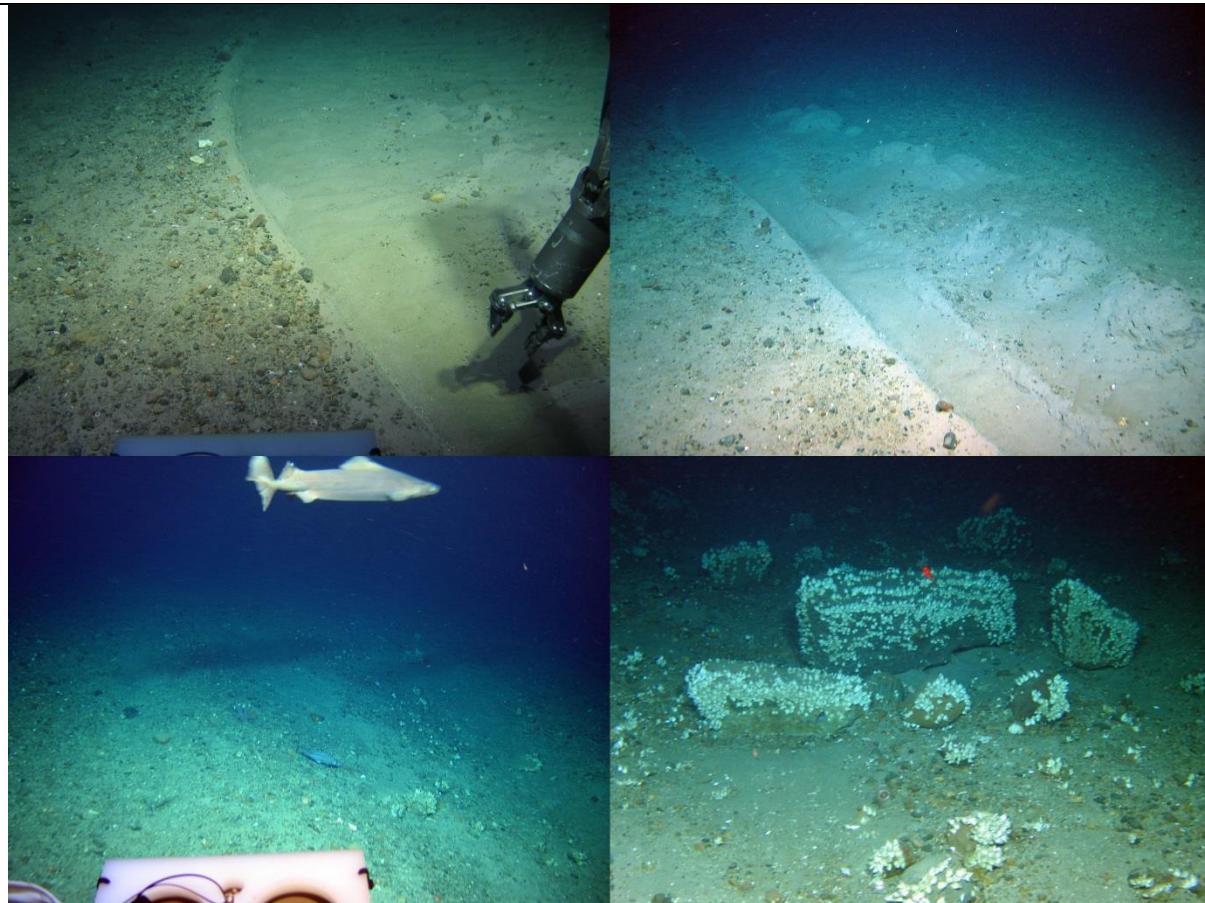
	Start	End
Date & Time	15/07/2017 14:37:28	15/07/2017 17:10:32
Latitude/ Longitude	55.56346483, -9.75328217	55.5448665, -9.7387915
Depth	971.79	960.55
Images	IMG_6323-IMG_6392.JPG	
Samples	2 x pushcores	

Location	C1
Target Features	Canyon, Escarpment
Depth Range	876.81-972.09m (av. 920.732m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The strong trawl mark furrow where the ROV tested the sediment and took two pushcores. Clearly displaying the rippled sand/mud inside the mark, and pebble/gravel/cobble substrate outside.

Top R. An example of the mud mounds found alongside some of the trawl marks.

Bottom L. A Leafscale gulper shark (*Centrophorus squamosus*) passing over the mixed substrate just as the barnacles begin to become dominant. Six sightings of this shark occur during the course of this dive, although it is hard to tell whether any are repeat encounters with the same individual.

Bottom R. The last third of this dive was spent over more mixed substrate with patches of boulders densely colonised by large barnacles. (M.AtMB.Ro.BarCom)

Summary Description (habitat transitions noted)

HD VIDEO A 0m/14:37pm [1] The first two thirds of this transect are spent over relatively flat mixed gravel/pebbles/cobbles on mud/sand with sparse/patchy urchins (especially OTU 194). This area has been heavily trawled. The 64 clearest furrows are marked in the enhanced OFOP file. The ROV generally moves in a diagonal right direction but frequently zigzags to track along a trawl mark/furrow. One particularly deep furrow (probably made by an otter board) can be seen at: 52m-1h02m when the ROV follows the furrow, stopping at 53m to test the sediment and at 55m taking two pushcores inside and outside of the mark. The furrows are often indicated by rippled mud/sand surrounded by gravel/pebbles/cobbles. Deeper furrows sometimes have mud mounds alongside, presumably due to some hydrodynamic effect of an otter board passing through. **1h48m [2]** The continuing relatively flat mixed substrate, with more frequent boulders becomes dominated by barnacles. **END OF HD VIDEO A 2h06m/16:44pm. START OF VIDEO B 0m/16:45pm** Continued barnacle encrusted rock/mixed substrate until **END OF HD VIDEO B 24m/17:10pm.**

Physical Data

Reef (types can be concurrent)	100 % reef	100 % geogenic		
		n/a	n/a	n/a
Substrates	<ul style="list-style-type: none"> - boulders - cobbles - pebbles/gravel - sand/mud 			
Geomorphology/Features	Canyon <ul style="list-style-type: none"> - deep furrow (trawl marks) - furrow (trawl marks) - mounds (trawl marks) - pits (trawl marks) 			
Annex 1 Types	<ul style="list-style-type: none"> - (pebble/cobble fields) - cobble/boulder fields 			
Pressures	<ul style="list-style-type: none"> - 64 x clear trawl marks - 1 x glass bottle - 2 x plastic 			

Biological Data			
Number of Species		37 spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U.	Name	Size/Growth	SACFOR
499	Actinaugue richardi	M	R
605	Actiniaria sp 20	M	R
41	Actiniidae sp (sandBolocera)	M	R
930	Actinopterygii sp 3	M	R
12	Bolocera tuediae	L	O
258	Brosme brosme	L	O
1077	Caridea (indet)	M	R
1048	Centrophorus squamosus	L	O
2	Ceriantharia	M	F
303	Coelorhynchus coelorhynchus	L	O
566	Coryphaenoides rupestris	L	F
131	Cirnoidea sp 1	M	R
1119	Echinidae sp (dark)	M	R
194	Echinidae sp (pink)	M	O
559	Echinidae sp (white)	M	R
317	Epizoanthus sp 1 (Paguridae Associated)	M	R
1039	Hydrolagus cf affinis	L	R
983	Hymenaster membranaceus	L	R
249	Lepidion eques	L	O
11	Majidae sp 1	S	R
285	Majidae sp 2	M	R
654	Molva molva	L	O
349	Mora moro	L	O
339	Munida tenuimana	M	R
1034	Notacanthiformes (indet)	L	R
1076	Ophiuroidae (indet)	S	R
205	Paguridae spp	M	R
266	Parastichopus tremulus	L	R
255	Phelliactis sp 1	L	O
800	Porifera encrusting (blue)	Crust	R
1	Porifera encrusting sp 1 (white)	Crust	R
1118	Sagartiidae sp (wide oral disc)	L	R
1134	Scyphozoa sp (indet)	M	R
106	Serpulidae sp 1	M	R
198	Stichastrella rosea	L	R
440	Synaphobranchus kaupii	L	F
1016	Trichiurus lepturus	L	O
Biotope List (Marine Habitat Classification for Britain & Ireland)			
Code	Name	Listed	
(var) M.AtMB.Co.UrcCom	(mixed sediment variant) Urchin dominated community on Atlantic mid bathyal coarse sediment		
M.AtMB.Ro.BarCom	Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata		
Biotope progression per habitat transition (# species, dominant/characteristic species)			
1	(var) M.AtMB.Co.UrcCom (small/sparse) 194 Echinidae sp (pink/white)		
2	M.AtMB.Ro.BarCom 82 Cirripedia sp		

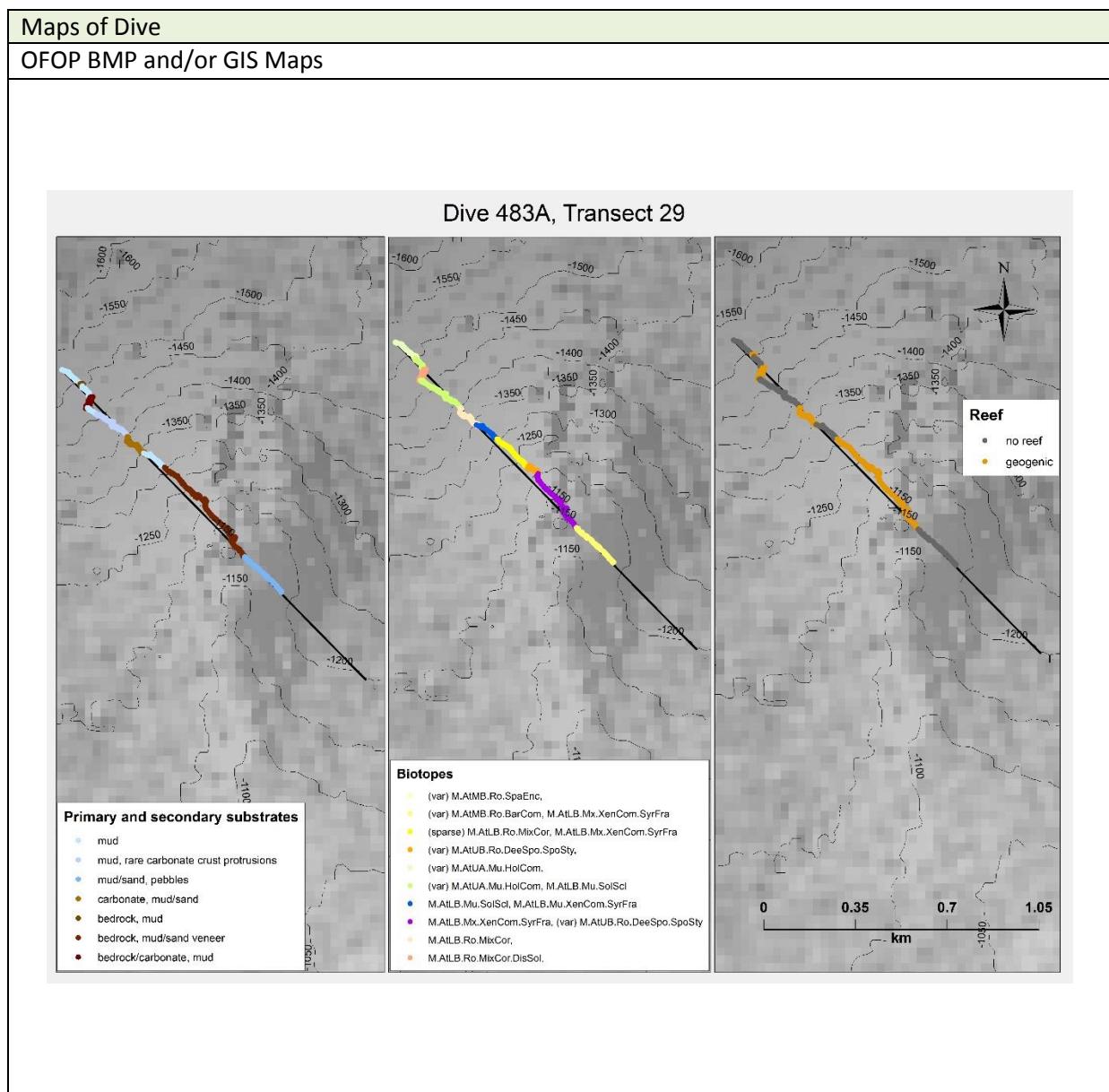
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
n/a	n/a	
Listed Species Encountered (Fish, Count)		
Centrophorus squamatus	6	IUCN/ OSPAR

Additional Comments
<ul style="list-style-type: none">- Dense pebbles/gravel overlaying mud throughout, and many trawl marks, areas of dense barnacles- This area appears to have been heavily trawled. Sixty-four clear trawl marks have been logged in the enhanced OFOP file.

DIVE SUMMARY	
DIVE #	TRANSECT #

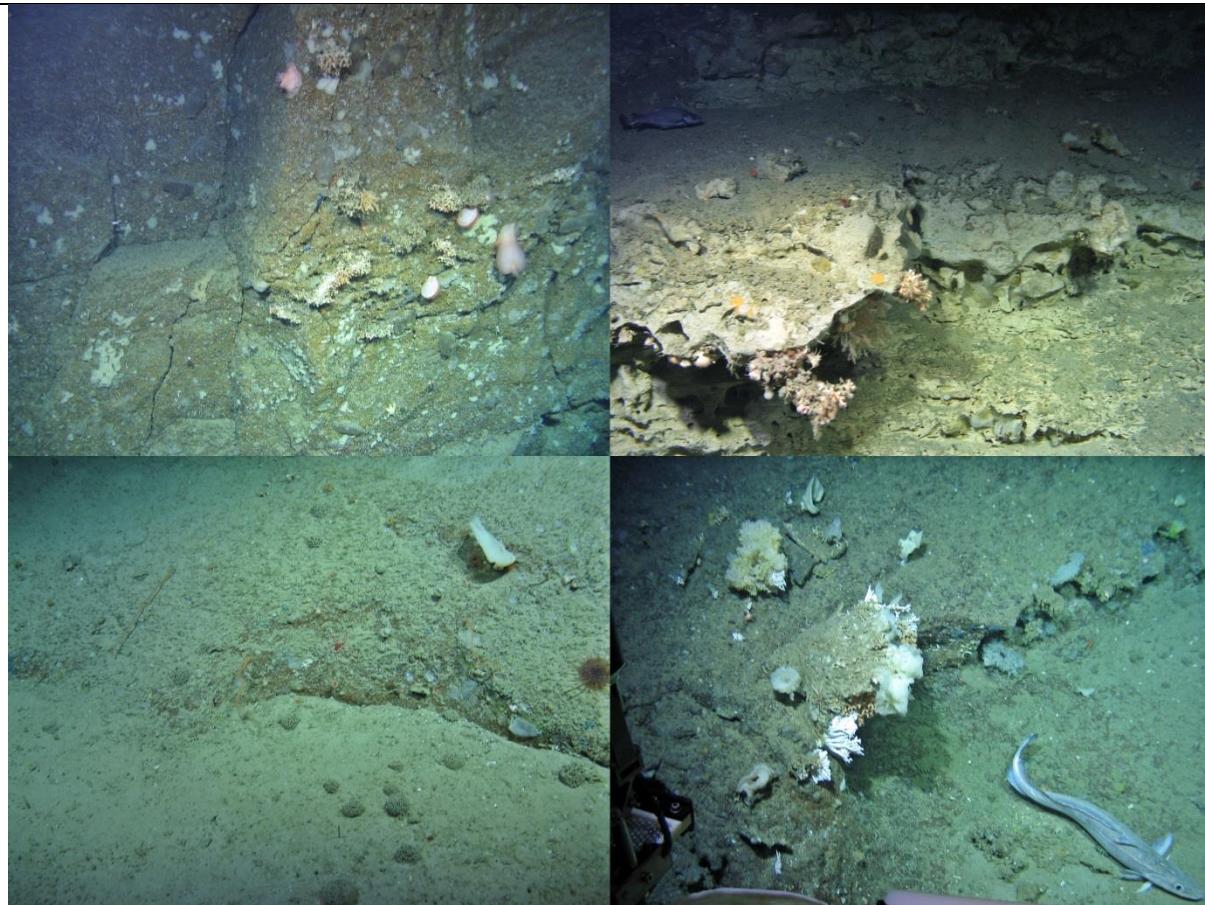
	Start	End
Date & Time	15/07/2017 21:48:49	15/07/2017 01:03:46 (Nav, vid ends 2m later same spot)
Latitude/ Longitude	55.49244167, -9.95122267	55.48437933, -9.93909233
Depth	1505.59	1189.31
Images	IMG_6401-IMG_6580.jpg	
Samples	2x Solenosmilia variabilis, 1x lamellate sponge, 2x Aphrocallistes	

Location	C2
Target Features	Canyon, Escarpment, Carbonate Mound
Depth Range	1106.82-1505.59 (av 1314.853m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



NOTE there are areas of soft substrate on this dive too, but 72% of this dive was geogenic reef of different types. These are what is exemplified here.

Top L. Bedrock cliffs with sparse encrusting fauna dominated by encrusting sponges, but also some areas with discrete *Solenosmilia variabilis* colonies.

Top R. There were vast terraced carbonate cliffs with mixed corals. While *S. variabilis* was found here also, more abundant were cup corals and *Stichopathes sp.*

Bottom L. Areas of sloping relatively smooth bedrock (possibly glacially eroded) with mud/sand veneer gave rise to sparse mixed coral communities of cup corals and *Stichopathes sp* but also xenophyophores (*Syringammina fragilissima*).

Bottom R. An area of rougher bedrock neighbouring the smooth bedrock hosted a rich sponge aggregation (especially *Aphrocallistes sp*) together with large Stylasterid hydrocorals.

Summary Description (habitat transitions noted)			
<p>START OF HD VIDEO A 0m/21:48pm [1] Transect starts on mud with some burrows, white <i>Benthogone sp</i> (OTU574) Holothurians dominate the epifauna. 8m [2] Low vertical bedrock cliffs (c 2m) with sparse encrusting fauna (some signs of barnacles but few look to be living at present) and a couple of larger sponges. 14m [3] back to mud and holothurians along with sparse cup corals. 18m [4] both protruding carbonate and bedrock cliffs, mixed corals initially, with an area dominated by discrete <i>Solenosmilia variabilis</i>. 33m-45m Sampling. 54-1h01m Sampling. 1h10m [5] up over cliffs to mud with sparse cup corals, occasionally with small carbonate protrusions. 1h28m [6] terraced carbonate cliffs with mixed corals and light mud/sand veneer. 1h44m CTD recordings stop. 1h49m [7] epifaunally rich mud at top of cliffs similar to in T26 – hosts xenophyophores (<i>Syringammina fragilissima</i>), cup corals and <i>Acanella arbuscula</i> together (labelled as mosaicked Cup coral/Xenophyophore communities, but may be more appropriate to create new combination community). 1h58m [8] relatively smooth sloping bedrock with light mud/sand veneer hosting sparse mixed corals and xenophyophores (not usually seen on bedrock!). END OF HD VIDEO A</p> <p>2h9m/23:58pm. START OF HD VIDEO B 0m/00:02am: continued until 3m [9] Bedrock less smooth here, hosting lamellate/lobose (especially <i>Aphrocallistes sp</i>) sponge aggregation with large stylasterid hydrocorals (assemblage usually associated with the upper bathyal). 6m-20m two sampling events. 29m [10] proceed up slope and to top of slope where rock is again smooth and large stylasterids & sponges persist in isolated patches while xenophyophores dominate intermediate areas. The current appears stronger up here. 50m [11] Top of slope, the landscape is rolling, video poor due to being too zoomed in outside of the light pool. Here there is a thicker sand/mud veneer hosting patchy xenophyophores, while scattered pebbles and rare cobbles are dominated by barnacles. Just as landscape starts sloping downhill again, navigation ends two minutes before HD VIDEO B ENDS in same spot at 1h05m/01:08am.</p>			

Physical Data			
Reef (types can be concurrent)	72 % Reef	72 % Geogenic	
		n/a	n/a
Substrates	<ul style="list-style-type: none"> - bedrock - carbonate - mud - mud/sand - pebbles 		n/a
Geomorphology/Features	Canyon Canyon/Escarpment Carbonate Mound <ul style="list-style-type: none"> - Terraced carbonate rock Escarpment <ul style="list-style-type: none"> - Rolling landscape - Smooth sloping bedrock 		
Annex 1 Types	<ul style="list-style-type: none"> - sloping bedrock - vertical bedrock - vertical carbonate 		
Pressures	2 x fishing gear, 5 x fishing line		

Biological Data								
Number of Species			118 spp					
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)								
O.T.U	Name	Size/Growth SACFOR						
585	Acanella arbicularia	L O	654	Molva molva	L	R		
608	Acanthogorgia cf armata	L O	339	Munida tenuimanus	M	R		
1062	Acesta excavata	M R	1126	Munnidopsis sp	M	R		
605	Actinaria sp 20	M R	563	Neocytthus helgae	L	R		
930	Actinopterygii sp 3	M R	1003	Nezumia aequalis	L	R		
1047	Actinoscyphidae sp 1 (pink)	L R	659	Octopodidae (indet)	L	R		
132	Actinostolidae sp 1	L R	551	Ophiomuseum lymani	L	O		
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L R	1076	Ophiuroidea (indet)	S	R		
278	Anthomastus grandiflorus	M R	646	Ophiuroidea sp (orangeDeep)	M	R		
594	Anthoptilum grandiflorum	L R	340	Ophiuroidea sp 7 (red)	M	R		
311	Anthothelia grandiflora	Mass R	918	Opisthotethis extensa	M	R		
264	Aphrocallistes sp	L F	205	Paguridae spp	M	R		
146	Aphroditidae sp 1	M R	1050	Paramuricea sp	L	R		
20	Ascidiae sp 2	M O	1042	Parapintipathes sp	L	O		
471	Asteronyx loveni	M R	1046	Pennatula aculeata	L	R		
1041	Bathyctenidae sp 1	M R	1114	Pennatulacea (indet)	M	R		
284	Bathyphantes sp (brown)	L R	1059	Pennatulacea sp (cf Kophobelemnidae)	L			
258	Brosme brosme	L R	436	Pentametrocrinus atlanticus	L	R		
1077	Caridea (indet)	M R	255	Phelliactis sp 1	L	R		
1077	Caridea (indet)	M O	555	Phormosoma placenta	M	R		
6	Caryophyllia sp	M F	552	Polyacanthonotus rissoanus	L	R		
584	Caryophyllia sp 5 (bullyeye)	M R	263	Porania pulvillus	L	O		
1057	Caryophyllidae sp (tentative)	M R	535	Porifera cup 2	L	O		
234	Ceramaster/Peltaster/Plinthaster sp 1	M R	800	Porifera encrusting (blue)	Crust	R		
2	Ceriantharia	M R	75	Porifera encrusting globose (pale)	Mass	O		
1069	Ceriantharia sp (giant)	L R	1	Porifera encrusting sp 1 (white)	Crust	R		
574	Centhophore sp (white)	L O	30	Porifera encrusting sp 10 (yellow)	Crust	R		
1129	Echinus (deepPinkSpine)	M R	1128	Porifera globosa (muddy)	L	O		
653	Chimera opalescens (correct)	L O	1127	Porifera globosa (spikyLoofah)	L	R		
1054	Chirostylidae (indet)	M R	623	Porifera lamellate sp 10 (YellowSolenoAssoc)	L	O		
540	Chrysopathes sp/Trissopathes sp	L R	1010	Porifera lamellate sp 12 (solen Assoc)	L	O		
211	Cidaris cidaris	M R	422	Porifera lamellate sp 7	L	O		
82	Cirripedia sp	Mass F	606	Porifera lamellate sp 9	L	F		
1059	Collossendeis sp	L O	137	Porifera massive globose sp 6	M	R		
39	Corallimorphidae sp 1	M R	576	Porifera massive lobose sp 18 (cf Farrea sp)	L	O		
577	Coryphaenoides quenneri	L O	380	Porifera tubular (cf Asconema foliatum)	L	O		
566	Coryphaenoides rupestris	L O	1090	Porifera tubular glassy (cf Farreidae)	M	R		
1072	Crinoidea sp (10 arm)	L O	1080	Pseudoanthomastus sp	L	O		
131	Crinoidea sp 1	M R	204	Reteporella sp 1	M	R		
1015	Dendrobathyphantes sp	L R	1118	Sagartiidae sp (wide oral disc)	L	O		
194	Echinidae sp (pink)	M R	41	Sagartiidae sp 3	M	R		
1122	Elpidiidae (indet)	M R	106	Serpulidae sp 1	M	R		
1056	Flabellum sp	M R	700	Solenosmilia variabilis	L	F		
1005	Galeus melastomus	L R	569	Squaliformes (Etmopteridae?)	L	O		
83	Geodia cf atlantica (Porifera massive lobose sp 6)	L O	547	Stauropathea arctica	L	O		
1022	Gersemia sp 3	L R	198	Stichastrella rosea	M	R		
1002	Goniasteridae sp	M R	560	Stichopathes sp	L	O		
307	Gorgonacea sp 7 (pink) cf Isidella	L O	361	Stylaster sp 1	L	O		
214	Gorgonocephalus sp 1	L R	440	Synaphobranchus kaupii	L	F		
208	Henricia sanguinolenta	M R	261	Syringammina fragilissima	M	O		
628	Holothuriidae sp 4 (cf Amperima)	M R	446	Trachychynus sp	L	O		
651	Hoplostethus atlanticus	L F	581	Umbellula sp	L	O		
917	Hyalonema sp 1	L O	1088	Unknown Hydrozoa/Bryozoa	M	R		
1110	Hymenaster sp	M R	532	Unknown sp 26 (Sabellidae?)	Mass	O		
274	Hymenodiscus coronata/Brisinga endacnemus	L O	586	Zoanthidea sp 2 (spongeAssoc)	Mass	R		
1064	Isididae sp 5 (fine branching)	L R	925	Zoanthidea sp 3 (HyalonemaAssoc)	Mass	R		
305	Leiopathes sp	L R	259	Zoarcidae sp 1	M	R		
249	Lepidion eques	L R	988	Zoroaster fulgens (slender)	L	O		
1089	Lophaster furcifer (white)	M R						
536	Mesothuria intestinalis	M R						

Biotope List (Marine Habitat Classification for Britain & Ireland)								
Code	Name	Listed						
(var) M.AtMB.Ro.BarCom	(lower bathyal variant) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata							
(var) M.AtMB.Ro.SpaEnc	(lower bathyal, non Psolus variant) Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata							
(var) M.AtUA.Mu.HolCom	(lower bathyal variant) Holothurian dominated community on Atlantic upper abyssal mud							
(var) M.AtUB.Ro.DeeSpo.Spo Sty	(lower bathyal variant) Lobose sponge and stylasterid assemblage on Atlantic upper bathyal rock and other hard substrata	Deep-sea sponge aggregations (ICES/OSPAR); Hard-bottom sponge aggregations (ICES subcategory); Coral gardens						

		(ICES/OSPAR); Hard-bottom coral garden: Stylasterid corals on hard substrata (ICES subcategory)
M.AtLB.Mu.SolScl	Solitary scleractinian field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden (ICES subcategory); Cup-corals fields (ICES subcategory)
M.AtLB.Mx.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mixed sediment	Mud and sand emergent fauna (ICES)
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden (ICES subcategory)
M.AtLB.Ro.MixCor.DisSol	Discrete Solenosmilia variabilis colonies on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
M.AtLB.Mu.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mud	Mud and sand emergent fauna (ICES)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtUA.Mu.HolCom 574 Benthogone sp (white)	
2	(var) M.AtMB.Ro.SpaEnc Encrusting sponges, 6 Caryophyllia sp	
3	(var) M.AtUA.Mu.HolCom, M.AtLB.Mu.SolScl 574 Benthogone sp (white), 1058 Caryophyllidae/Fabellidae (indet), 2 Ceriantharia	
4	M.AtLB.Ro.MixCor.DisSol Encrusting sponges, 700 Solenosmilia variabilis	
5	(var) M.AtUA.Mu.HolCom, M.AtLB.Mu.SolScl 1058 Caryophyllidae/Fabellidae (indet), 2 Ceriantharia	
6	M.AtLB.Ro.MixCor Encrusting sponges, 605 Actiniaria sp20, 560 Stichopathes sp	
7	M.AtLB.Mu.SolScl, M.AtLB.Mu.XenCom.SyrFra 1058 Caryophyllidae/Fabellidae (indet), 261 Syringammina fragilissima, 585 Acanella arbuscula	
8	(sparse) M.AtLB.Ro.MixCor, M.AtLB.Mx.XenCom.SyrFra 6 Caryophyllia sp, 261 Syringammina fragilissima, 560 Stichopathes sp	
9	(var) M.AtUB.Ro.DeeSpo.SpoSty 264 Aphrocallistes sp, 361 Stylaster sp	
10	M.AtLB.Mx.XenCom.SyrFra, (var) M.AtUB.Ro.DeeSpo.SpoSty 261 Syringammina fragilissima, 361 Stylaster sp	
11	(var) M.AtMB.Ro.BarCom, M.AtLB.Mx.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima	

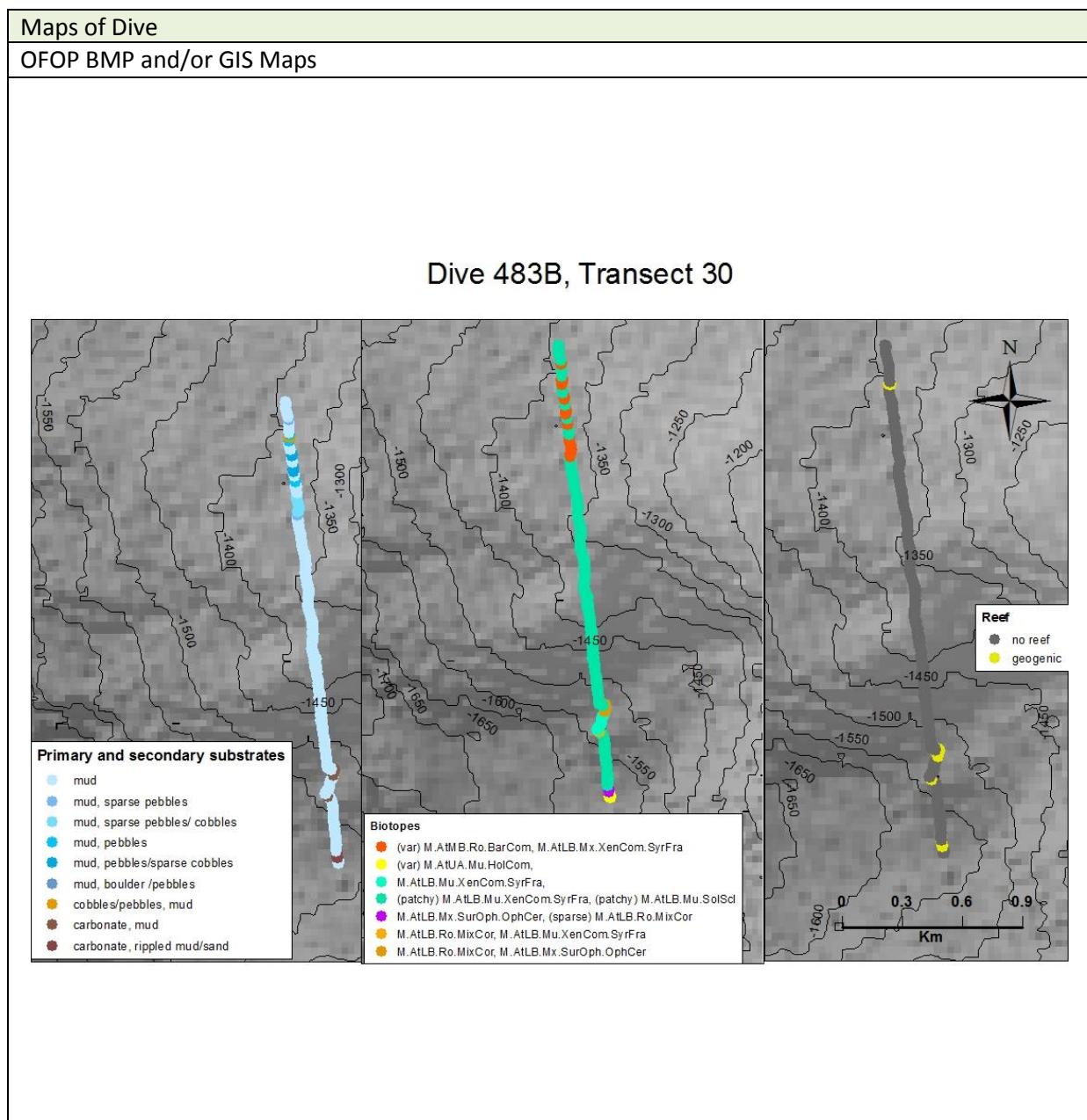
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens	ICES/OSPAR	
- Hard-bottom coral garden	ICES subcategory	
o Colonial scleractinians on rocky outcrops	ICES subcategory	
o Stylasterid corals on hard substrata	ICES subcategory	
- Soft-bottom coral garden	ICES subcategory	
o Cup-corals fields	ICES subcategory	
o (Soft-bottom gorgonian and black coral gardens)	ICES subcategory	
Deep-sea sponge aggregations	ICES/OSPAR	
- Hard-bottom sponge aggregations	ICES subcategory	
Mud and sand emergent fauna	ICES	
Listed Species Encountered (Fish, Count)		
<i>Hoplostethus atlanticus</i> (predominantly juveniles <20cm in length)	21	OSPAR/IUCN

Additional Comments		
<ul style="list-style-type: none"> - Many juvenile (c 10-20cm) <i>Hoplostethus atlanticus</i> especially in the first 2hrs. - This is a very diverse dive due to several different diverse assemblages. The deep sea sponge/stylasterid aggregation being particularly speciose. 		

DIVE SUMMARY			
DIVE #	483B	TRANSECT #	30

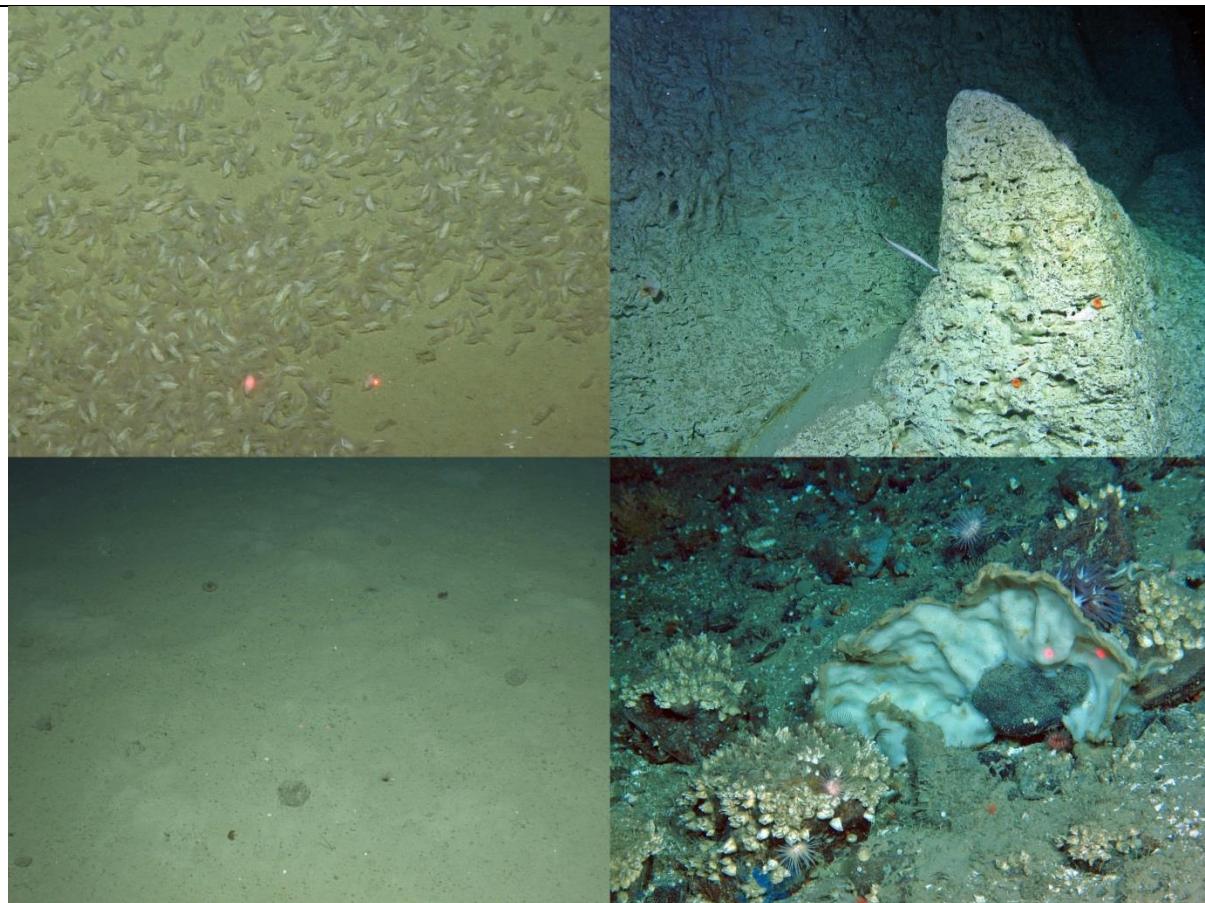
	Start	End
Date & Time	16/07/2017 02:49:48	16/07/2017 05:28:18
Latitude/ Longitude	55.49843017, -9.939302	55.51872833, -9.9408315
Depth	1561.92	1374.64
Images	IMG_6583-IMG_6684.JPG	
Samples	N/A	

Location	C2
Target Features	Canyon, Escarpment
Depth Range	1333.1m-1562.93m (av. 1422.246m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The start of the transect lands on a region of mud with dense aggregations of juvenile holothurians (Elpidiidae sp, OTU1116). ((var) M.AtUA.Mu.HolCom)

Top R. The unusual carbonate pinnacles and gullies that are presented in this transect. Three different encounters with such features occur within the first 45mins. ((sparse)M.AtLB.Ro.MixCor)

Bottom L. The vast majority of this dive is over mud with patchy Xenophyophores (Syringammina fragilissima) and cup corals (Caryophyllidae/Flabellidae). ((patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl)

Bottom R. There are frequent encounters with sparse pebbles colonised by barnacles. This image shows the one dense cobble/pebble patch encountered towards the end of the dive also hosting several lamellate sponges among other epifauna. ((var) M.AtMB.Ro.BarCom)

Summary Description (habitat transitions noted)			
<p>HD VIDEO C (1st of this dive) 0m/02:49am [1]: Transect starts on relatively flat mud with patchy dense aggregations of juvenile holothurians (Elpidiidae sp, OTU1116). 5m [2] the landscape dips revealing rippled mud/sand and carbonate protrusions forming pinnacles and gullies with sparse mixed corals and <i>Ophiomuseum lymani</i>. The sediment then rises up back to 7m [3] mud "plateau" with sparse patchy epifauna with both xenophyophores and cup corals and occasional sea pens. This is the main assemblage/ mosaic encountered throughout the dive. 24m [4] a large squared off carbonate boulder (2-3m round) and a couple of smaller boulders were encountered hosting sparse mixed corals especially <i>Paramuricea</i> sp. 25m [5] continue over mud with xenophyophores/cup corals. 31m [6] more protruding carbonate, ~5m high with pinnacles and gullies in interesting shapes. Again hosting mixed corals. 45m [7] ROV spins around and proceeds on over more mud xenophyophores/cup corals continued until the END OF HD VIDEO C 1h56m/04:46am. START OF HD VIDEO D (2nd of this dive) 0m/04:51am. Vision is obscured (mud/zoom issues) for the first 30s. 1m [8] The first of several patches of sparse pebbles and rare cobbles mainly colonised by barnacles, with xenophyophores dominating the intermediate mud areas. 6m [9] back to mud xenophyophores/cup corals. 12m [10] pebble/barnacle patch, with one boulder, 14m[11] mud xenophyophores/cup corals 15m[12] pebbles/barnacles rare cobbles, 17m [13] mud xenophyophores/cup corals, 18m [14] pebbles/barnacles rare cobbles, 21m [15] mud xenophyophores/cup corals, 23m [16] pebbles and barnacles again, but this time leading to a dense seam of cobbles/pebbles and barnacles with a couple of large lamellate sponges, the ROV zig zags over this before 29m [17] continuing back over mud xenophyophores/cup corals, 32m [18] a final sparse patch of pebbles/barnacles, 33m [19] continued xenophyophores/cup corals until the END OF HD VIDEO D at 36m/ 05:28am.</p>			

Physical Data			
Reef (types can be concurrent)	12% reef	12% geogenic reef	
		n/a	n/a
Substrates		- boulder - carbonate - cobbles/pebbles - mud - pebbles - rippled mud/sand	n/a
Geomorphology/Features	Canyon	- carbonate pinnacles/gullies - furrow - large boulder (2-3m)	n/a
Annex 1 Types		- broken rock - cobble field - gullies - pinnacles	
Pressures		- 4 x fishing gear - 5 x plastic - 1 x possible trawl mark - 1 x possible metal?	

Biological Data			
Number of Species		79 spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U	name	size/growth	SACFOR
585	Acanella arbuscula	L	O
554	Actinernus sp	L	R
605	Actiniaria sp 20	M	R
1047	Actinoscyphidae sp 1 (pink)	L	R
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	R
278	Anthomastus grandiflorus	M	R
594	Anthoptilum grandiflorum	L	O
311	Anthothelia grandiflora	Mass	R
1133	Anthozoa white branching	M	R
146	Aphrotididae sp 1	M	R
1131	Apristurus sp (indet)	L	R
471	Asteronyx loveni	M	R
1077	Caridea (indet)	M	R
6	Caryophyllia sp	M	R
584	Caryophyllia sp 5 (bullseye)	M	R
1058	Caryophyllidae/Fabellidae (indet)	M	O
1111	Cataetyx laticeps	L	O
2	Ceriantharia	M	R
1069	Ceriantharia sp (giant)	L	R
984	cf Halcampoididae sp	M	R
1054	Chirostylidae (indet)	M	R
82	Cirripedia sp	Mass	F
1059	Colossendeis sp	L	R
39	Corallimorphidae sp 1	M	R
1105	Coryphaenoides armatus	L	R
577	Coryphaenoides quennereri	L	F
566	Coryphaenoides rupestris	L	F
1072	Crinoidea sp (10 arm)	L	R
131	Crinoidea sp 1	M	R
1015	Dendrobathypathes sp	L	R
1116	Elpidiidae sp (juv)	S	O
1056	Flabellum sp	M	R
83	Geodia cf atlantica (Porifera massive lobose	L	O
1052	Gracilechinus cf alexandri	M	R
23	Halcampoididae sp 1	S	R
622	Halipteris cf finmarchica	L	R
936	Harriotta raleighana	L	R
628	Holothuroidea sp 4 (cf Amperima)	M	R
651	Hoplostethus atlanticus	L	F
1039	Hydrolagus cf affinis	L	O
1125	Hygrosoma sp	L	O
1067	Laucoraja sp	L	R
654	Molva molva	L	O
339	Munida tenuimana	M	R
563	Neocyttus helgae	L	R
551	Ophiomuseum lymani	L	O
1076	Ophiuroidae (indet)	S	R
918	Opisthoteuthis extensa	L	R
205	Paguridae spp	S	R
1050	Paramureicea sp	L	O
1042	Parantipathes sp	L	R
1046	Pennatula acculeata	L	R
1059	Pennatulacea sp (cf Kophobelemnidae)	L	R
436	Pentametrocrinus atlanticus	L	R
255	Phelliactis sp 1	L	R
555	Phormosoma placenta	M	R
552	Polyacanthonotus rissoanus	L	R
263	Poraria pulvillus	L	O
800	Porifera encrusting (blue)	Crust	R
30	Porifera encrusting sp 10 (yellow)	Crust	R
30	Porifera encrusting sp 10 (yellow)	Crust	R
105	Porifera encrusting sp 18 (cream)	Crust	R
1132	Porifera lamellate lobose (fleshy)	M	R
1053	Porifera lamellate sp 13	L	O
606	Porifera lamellate sp 9	L	R
41	Sagartiidae sp 3	M	R
1130	Scleractinia sp (mud Butterfly)	M	R
700	Solenosmilia variabilis	L	R
569	Squaliformes (Etmopteroideae?)	L	R
547	Stauropathes arctica	L	R
547	Stauropathes arctica	L	O
198	Stichastrella rosea	M	R
560	Stichopathes sp	L	R
440	Synaphobranchus kaupii	L	F
261	Syringammina fragilissima	M	O
581	Umbellula sp	L	O
1027	Unknown Hydrozoa/Bryozoa/Annelida	Mass	R
1117	UnknownSpring (small)?	M	R
291	Zoarcidae sp 2	L	R

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtMB.Ro.BarCom	(lower bathyal variant) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
(var) M.AtUA.Mu.HolCom	(Lower bathyal variant) Holothurian dominated community on Atlantic upper abyssal mud	
M.AtLB.Mu.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mud	Mud and sand emergent fauna (ICES)
M.AtLB.Mx.XenCom.SyrFra	Syringammina fragilissima field on Atlantic lower bathyal mixed sediment	Mud and sand emergent fauna (ICES)
M.AtLB.Mx.SurOph.OphCer	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Mu.SolScl	Solitary scleractinian field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden (ICES subcategory); Cup-coral fields (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtUA.Mu.HolCom 1116 Elpidiidae sp (juveniles)	
2	M.AtLB.Mx.SurOph.OphCer, (sparse) M.AtLB.Ro.MixCor 551 Ophiomuseum lymani, 800 Porifera encrusting blue	
3	(patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl 261 Syringammina fragilissima, 1058 caryophyllidae/Flabellidae (indet)	
4	M.AtLB.Ro.MixCor, M.AtLB.Mu.XenCom.SyrFra 1050 Paramuricia sp, 261 Syringammina fragilissima	
5	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima	
6	M.AtLB.Ro.MixCor, M.AtLB.Mx.SurOph.OphCer 605 Actiniaria sp 20, 551 Ophiomuseum lymani	
7	(patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl 261 Syringammina fragilissima, 1058 caryophyllidae/Flabellidae (indet)	
8	(var) M.AtMB.Ro.BarCom, M.AtLB.Mx.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima	
9	(patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl 261 Syringammina fragilissima, 1058 caryophyllidae/Flabellidae (indet)	

10	(var) M.AtMB.Ro.BarCom, M.AtLB.Mx.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima
11	(patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl 261 Syringammina fragilissima, 1058 caryophyllidae/Flabellidae (indet)
12	(var) M.AtMB.Ro.BarCom, M.AtLB.Mx.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima
13	(patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl 261 Syringammina fragilissima, 1058 caryophyllidae/Flabellidae (indet)
14	(var) M.AtMB.Ro.BarCom, M.AtLB.Mx.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima
15	(patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl 261 Syringammina fragilissima, 1058 caryophyllidae/Flabellidae (indet)
16	(var) M.AtMB.Ro.BarCom, M.AtLB.Mx.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima
17	(patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl 261 Syringammina fragilissima, 1058 caryophyllidae/Flabellidae (indet)
18	(var) M.AtMB.Ro.BarCom, M.AtLB.Mx.XenCom.SyrFra 82 Cirripedia sp, 261 Syringammina fragilissima
19	(patchy) M.AtLB.Mu.XenCom.SyrFra, (patchy) M.AtLB.Mu.SolScl 261 Syringammina fragilissima, 1058 caryophyllidae/Flabellidae (indet)

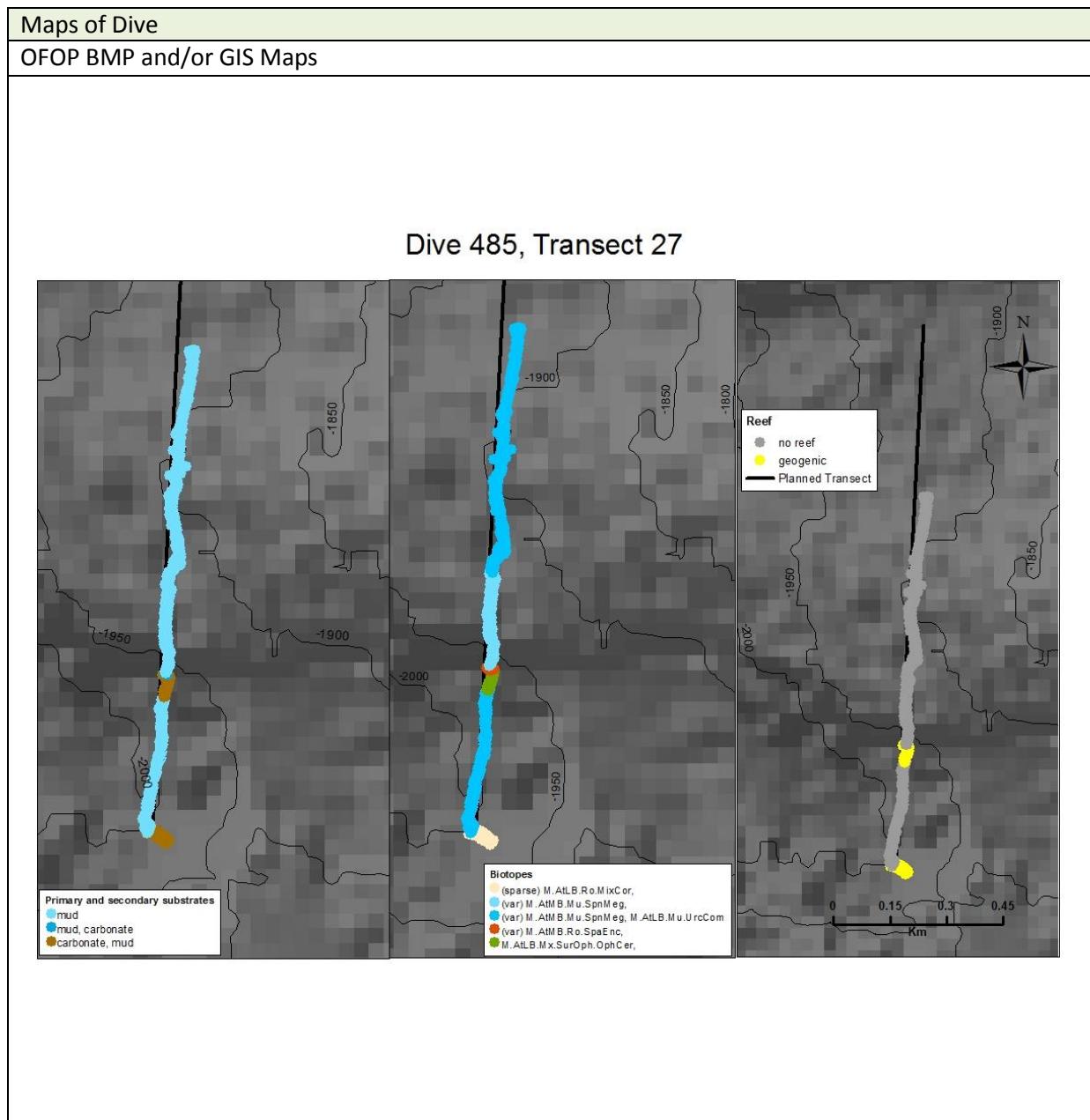
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Mud and sand emergent fauna	ICES	
Coral gardens	ICES/OSPAR	
- Hard-bottom coral garden	ICES Subcategory	
o Hard-bottom gorgonian and black coral gardens	ICES Subcategory	
- Soft-bottom coral garden	ICES Subcategory	
o Cup-corals fields	ICES Subcategory	
Listed Species Encountered (Fish, Count)		
<i>Hoplostethus atlanticus</i> (juveniles)	22	IUCN/ OSPAR

Additional Comments		
<ul style="list-style-type: none"> - Very strange carbonate features (pinnacles, gullies) arising from mud plane. Juvenile holothurian aggregation, patchy xenophyophores, cobble patches with barnacles. - This is a very geologically interesting dive. Huge (c10m) carbonate structures with gullies and pinnacles arising from flat mud seafloor. - Many juvenile orange roughy (<i>Hoplostethus atlanticus</i>) were encountered on this dive, and sometimes there are many fish hovering over the substrate (especially <i>Synaphobranchus kaupii</i>, and grenadiers). 		

DIVE SUMMARY	
DIVE #	TRANSECT #
485	27

	Start	End
Date & Time	17/07/2017 07:16:15	17/07/2017 09:01:00
Latitude/ Longitude	55.3875703, -10.16850417	55.39624267, -10.1659908
Depth	1939.44	1872.33
Images	IMG_6687-IMG_6803.JPG	
Samples	1 x Phormosoma, 1 x Pennatulacea, 1 x Pushcore	

Location	C3
Target Features	Canyon
Depth Range	1845.16-1950.99m (av. 1890.245m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. There are two areas on this dive with carbonate cliffs. Both are sparsely populated by epifauna. One with sparse mixed corals and the other (above) with encrusting sponges and many yellow sea stars (OTU1189). ((var) M.AtMB.Ro.SpaEnc)

Top R. The mud substrate at the base of the first cliff is populated by thin sea pens (OTU1083) with patches of abundant white echinoids (OTU559). ((var) M.AtMB.Mu.SpnMeg, M.AtLB.Mu.UrcCom)

Bottom L. The mud substrate above the second carbonate cliff again is colonised by sea pens (especially OTU1083) and again urchins, but here *Phormosoma placenta* is the dominant species. ((var) M.AtMB.Mu.SpnMeg, M.AtLB.Mu.UrcCom)

Bottom R. The large bundle of fishing net encountered on this dive.

Summary Description (habitat transitions noted)

START OF HD VIDEO 0m/07:16:15 [1] The transect starts at the base of a sloping/vertical carbonate cliff with mud veneer and sparse mixed corals (especially *Paramuricea sp*). Disturbed sediment blocks partial view until 1m and the small dark (black/red) jellyfish seen here can be seen throughout the dive. 3m stop ascent at overhang colonised by Brisingids and move left along it. 4m start ascending again. 9m ascent stopped by disturbed sediment. ROV starts descending again reaching base of cliff at **13m [2]** ROV turns left to proceed over mud bottom (good view from 15m). Dominant fauna alternates between sea pens (especially thin unknown, OTU1083) and patches of white echinoids (OTU559). **35m [3]** sloping carbonate with mud veneer and broken flakes of carbonate is again encountered, here with *Ophiomuseum lymani* and Cerianthid anemones. **38m [4]** the slope becomes a cliff with sometimes bare carbonate. The rock is only sparsely colonised, occasional patches of blue encrusting sponge and multiple yellow sea stars (OTU1189) are the dominant fauna until the top where a thin strip of *Bathyocrinidae sp* are encountered (not enough to form new biotope). **42m [5]** Back on muddy sediment, sea pens again dominate along with Cerianthid anemones. **52m [6]** Sea pens continue but alternate dominance with urchins, now *Phormosoma placenta*. 53m moving diagonally right. 54m moving forwards up to a large fishing net bundle (imagery 54-59m). 1h00m moving diagonally left. 1h01m-1h02m stopped to image *Phormosoma placenta* walking. 1h07m-1h14m stopped to sample *P. placenta*. 1h32m stopped to sample an unknown sea pen and take a pushcore before **END OF HD VIDEO AT 1h44m/09:01:00.**

Physical Data			
Reef (types can be concurrent)	<19% reef	<19 % geogenic	
		n/a	n/a
			n/a
Substrates	<ul style="list-style-type: none"> - mud - carbonate 		
Geomorphology/Features	Canyon		
Annex 1 Types	<ul style="list-style-type: none"> - sloping carbonate - vertical carbonate - broken carbonate 		
Pressures	<ul style="list-style-type: none"> - 1 x fishing line - 2 x fishing net (one a whole bundled net) 		

Biological Data				
Number of Species		52 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
554	Actinernus sp	L	O	
4	Actiniaria sp 1	L	O	
605	Actiniaria sp 20	M	R	
930	Actinopterygii sp 3	M	R	
1047	Actinoscyphiidae sp 1 (pink)	L	R	
278	Anthomastus grandiflorus	M	R	
1189	Astroidea sp (yellowDeep)	M	R	
471	Asteronyx loveni	M	R	
1041	Bathycrinidae sp 1	M	O	
284	Bathyphates sp (brown)	L	R	
1124	Benthothuria sp	L	O	
1077	Caridea (indet)	M	R	
6	Caryophyllia sp	M	R	
1111	Cataetyx laticeps	L	O	
2	Ceriantharia	M	O	
1069	Ceriantharia sp (giant)	L	R	
1107	cf Anthoptilum sp	L	R	
984	cf Halcampoididae sp	M	R	
1008	Chrysogorgidae sp 1	L	R	
1059	Colossendeis sp	L	R	
577	Coryphaenoides guentheri	L	O	
1108	Distichoptilum gracile	L	O	
194	Echinidae sp (pink)	M	R	
559	Echinidae sp (white)	M	O	
1018	Epigonus telescopus?	L	R	
1056	Flabellum sp	M	R	
1154	Henricia sp (deep)	M	R	
432	Holothuroidea (cf Laetmogone) (purple)	L	R	
1190	Holothuroidea sp (muddyDeep)	M	R	
628	Holothuroidea sp 4 (cf Amperima)	M	R	
1125	Hygrosooma sp	L	O	
274	Hymenodiscus coronata/ Brisinga endacanemos	L	O	
1160	Lepidion guentheri	L	O	
536	Mesothuria intestinalis	M	R	
1102	Munnopsidae	M	R	
551	Ophiomuseum lymani	L	R	
1050	Paramuricea sp	L	O	
1046	Pennatula acculeata	L	R	
1191	Pennatulacea sp (submergedAxis)	M	R	
1083	Pennatulacea sp (thin)	L	O	
255	Phelliactis sp 1	L	O	
555	Phormosoma placenta	M	O	
552	Polyacanthonotus rissoanus	L	O	
800	Porifera encrusting (blue)	Crust	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
433	Pseudarchaster sp 1	L	R	
1134	Scyphozoa sp (indet)	M	F	
547	Stauropathes arctica	L	R	
440	Synaphobranchus kaupii	L	O	
581	Umbellula sp	L	R	
259	Zoarcidae sp 1	M	R	
291	Zoarcidae sp 2	L	O	

Biotope List (Marine Habitat Classification for Britain & Ireland)				
Code	Name	Listed		
(sparse) M.AtLB.Ro.MixCor	(sparse) Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	(too sparse?) Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)		

(var) M.AtMB.Mu.SpnMeg	(lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
M.AtLB.Mu.UrcCom	Urchin dominated community on Atlantic lower bathyal mud	
M.AtLB.Mx.SurOph.OphCer	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
(var) M.AtMB.Ro.SpaEnc	(lower bathyal variant) Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(sparse) M.AtLB.Ro.MixCor 1050 Paramuricea sp	
2	(var) M.AtMB.Mu.SpnMeg, M.AtLB.Mu.UrcCom 1083 Pennatulacea sp (thin), 559 Echinidae sp (white)	
3	M.AtLB.Mx.SurOph.OphCer 2 Ceriantharia, 551 Ophiomuseum lymani	
4	(var) M.AtMB.Ro.SpaEnc 1189 Asteroidea sp (yellowDeep), 800 Porifera encrusting (blue), 1041 Bathycrinidae sp 1	
5	(var) M.AtMB.Mu.SpnMeg 1083 Pennatulacea sp (thin), 2 Ceriantharia	
6	(var) M.AtMB.Mu.SpnMeg, M.AtLB.Mu.UrcCom 1083 Pennatulacea sp (thin), 555 Phoromosoma placenta	

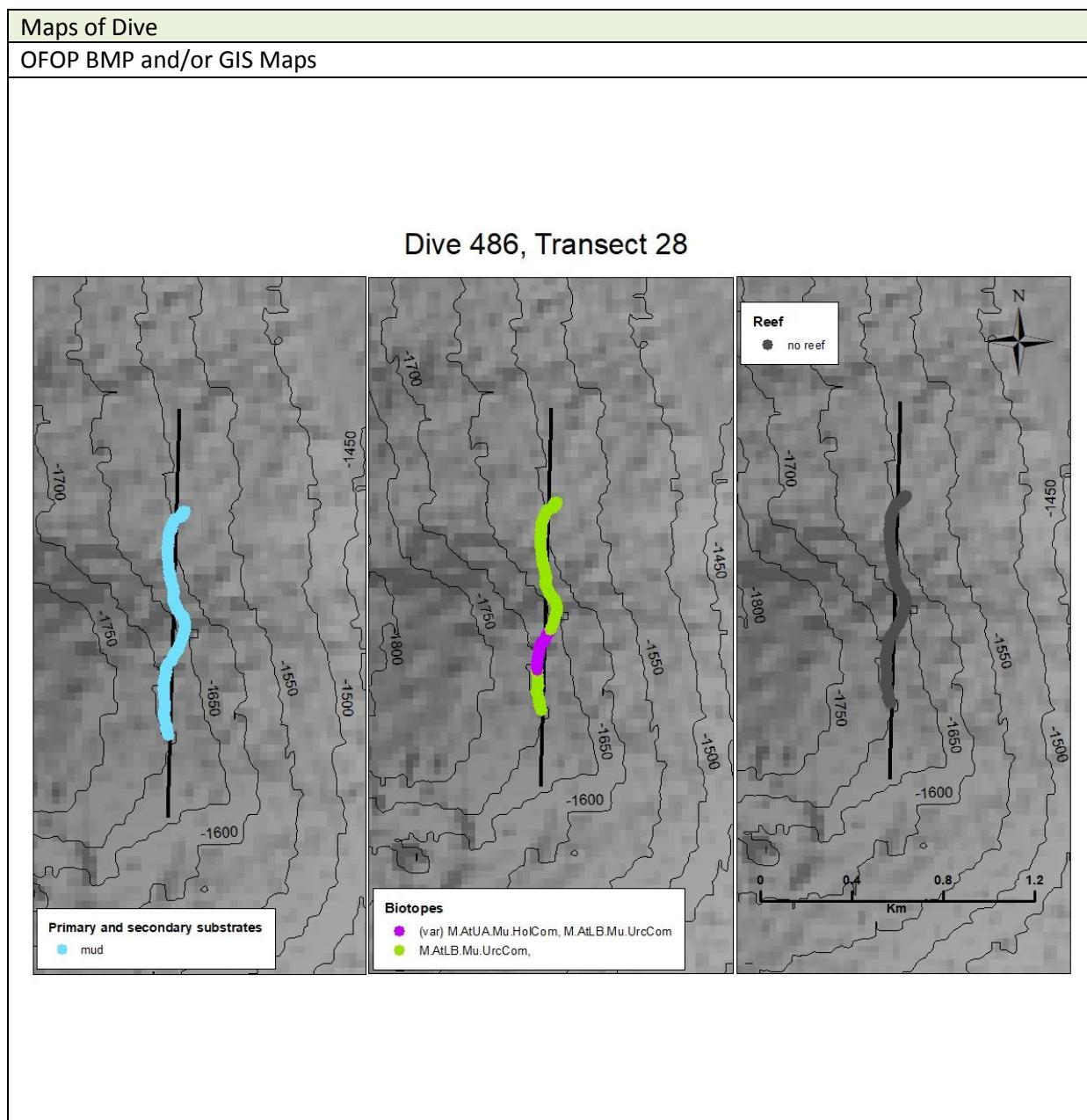
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES) (too sparse?) Coral gardens (too sparse?) Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	OSPAR ICES (ICES/OSPAR) (ICES subcategory)	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
- Two areas with sparsely colonised carboante cliffs, the rest is mud with thin sea pens/urchins. Large bundled fishing net encountered.		

DIVE SUMMARY	
DIVE #	TRANSECT #
486	28

	Start	End
Date & Time	17/07/2017 12:28:41	17/07/2017 13:44:28
Latitude/ Longitude	55.379743, -10.143609	55.38778733, -10.1416228
Depth	1637.41	1535.13
Images	IMG_6804-IMG_6838.JPG	
Samples	1 x pushcore	

Location	C3
Target Features	Canyon
Depth Range	1532.54m-1637.55m (av. 1582.425m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The whole transect was spent on sloping mud with *Phormosoma placenta* urchins abundant throughout the dive.(M.AtLB.Mu.UrcCom)

Top R. While *P. placenta* continued, patchy aggregations of thousands of juvenile holothurians were encountered. These were too small to identify but likely belong to the family Elpidiidae. ((var) M.AtUA.Mu.HolCom)

Bottom L. A close up on two *Phormosoma placenta* urchins and one of several *Umbellula sp* sea pens seen throughout the dive.

Bottom R. The sea star *Zoroaster fulgens* (slender morph) was encountered several times throughout the dive.

Summary Description (habitat transitions noted)

START OF HD VIDEO 0m/12:28:41 [1] The whole transect was spent on muddy substrate with the urchin *Phormosoma placenta* dominating the epifauna (at least one every 10m). **13m [2]** While the urchins and mud continue, there this area of the transect encounters multiple patches of thousands of juvenile holothurians (probably from the family Elpidiidae). These continue until **25m [3]** return to *P. placenta* dominated mud slopes. Stops for imagery at 38-39m (*Phormosoma*), 59-1h01m (*Phormosoma/Umbellula*), 1h05m-1h06m (octopus), then 1h07m stop to take a pushcore before **END OF HD VIDEO AT 1h15m/13:44:28.**

Physical Data

Reef (types can be concurrent)	n/a	n/a	
		n/a	n/a
			n/a
Substrates	- mud		
Geomorphology/Features	Canyon		
Annex 1 Types	n/a		
Pressures	1x Rope/net		

Biological Data

Number of Species

32 spp

Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)

O.T.U.	Name	Size/Growth	SACFOR
585	<i>Acanella arbuscula</i>	L	O
605	<i>Actiniaria</i> sp 20	M	R
930	<i>Actinopterygii</i> sp 3	M	R
146	<i>Aphroditidae</i> sp 1	M	R
1124	<i>Benthothuria</i> sp	L	O
1077	<i>Caridea</i> (indet)	M	R
1111	<i>Cataetyx laticeps</i>	L	R
2	<i>Ceriantharia</i>	M	R
1059	<i>Colossendeis</i> sp	L	R
577	<i>Coryphaenoides guentheri</i>	L	O
566	<i>Coryphaenoides rupestris</i>	L	O
1116	<i>Elpidiidae</i> sp (juv)	S	F
936	<i>Harriotta raleighana</i>	L	R
1154	<i>Henricia</i> sp (deep)	M	R
628	<i>Holothuroidea</i> sp 4 (cf <i>Amperima</i>)	M	R
1125	<i>Hygrosoma</i> sp	L	R
274	<i>Hymenodiscus coronata/ Brisinga endeca</i>	L	O
1160	<i>Lepidion guentheri</i>	L	O
1034	<i>Notacanthiformes</i> (indet)	L	R
659	<i>Octopodidae</i> (indet)	L	R
255	<i>Phelliactis</i> sp 1	L	O
555	<i>Phormosoma placenta</i>	M	F
552	<i>Polyacanthonotus rissoanus</i>	L	R
433	<i>Pseudarchaster</i> sp 1	M	R
1115	<i>Pterasteridae</i> sp	L	O
1134	<i>Scyphozoa</i> sp (indet)	M	R
440	<i>Synaphobranchus kaupii</i>	L	O
446	<i>Trachychyncus</i> sp	L	O
581	<i>Umbellula</i> sp	L	O
1117	UnknownSpring (small)?	M	R
291	<i>Zoarcidae</i> sp 2	L	R
988	<i>Zoroaster fulgens</i> (slender)	L	O

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Mu.UrcCom	Urchin dominated community on Atlantic lower bathyal mud	
(var) M.AtUA.Mu.HolCom	(lower bathyal variant) Holothurian dominated community on Atlantic upper abyssal mud	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.UrcCom 555 Phormosoma placenta	
2	(var) M.AtUA.Mu.HolCom, M.AtLB.Mu.UrcCom 1116 Elpidiidae (juv), 555 Phormosoma placenta	
3	M.AtLB.Mu.UrcCom 555 Phormosoma placenta	

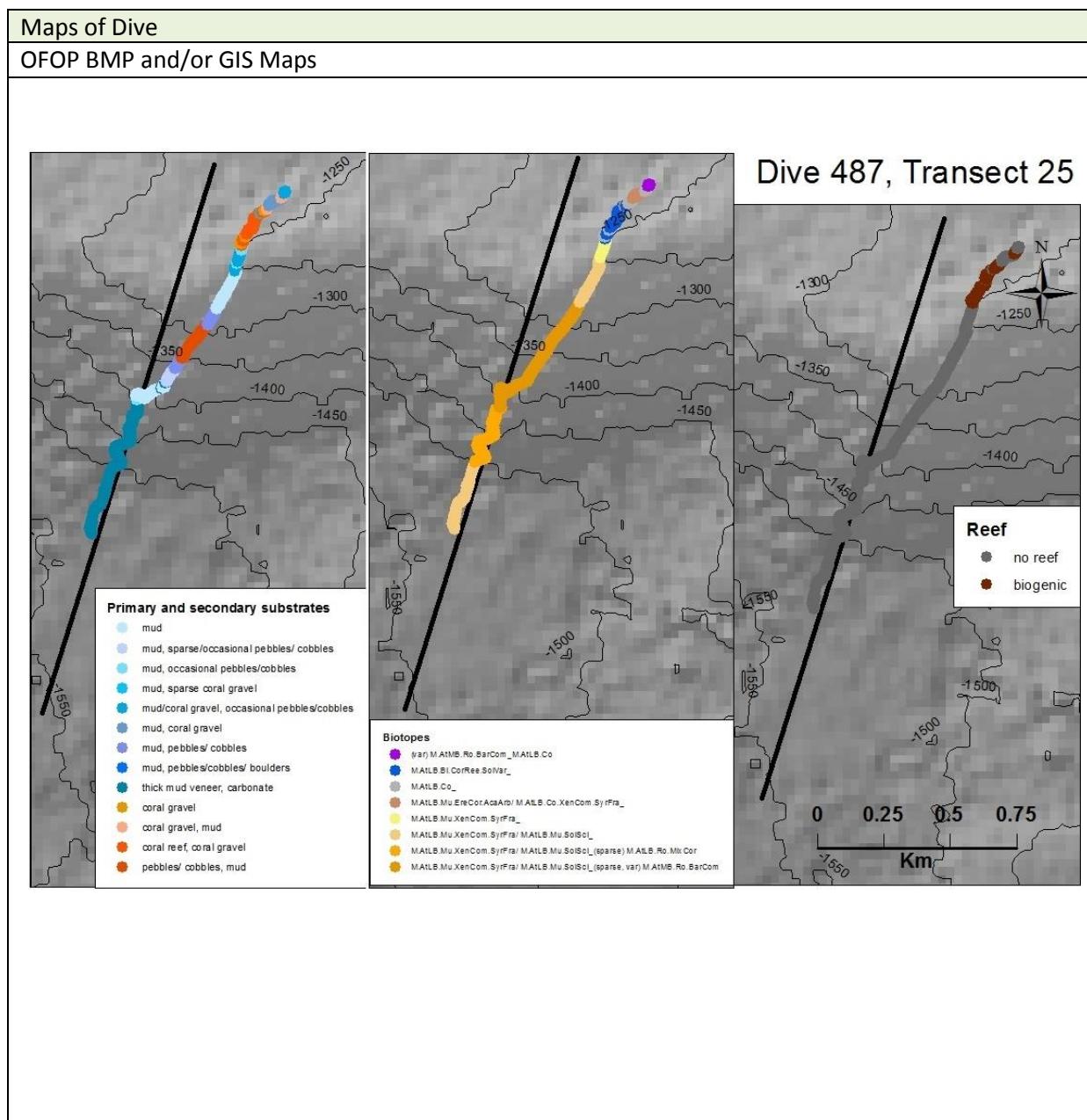
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
n/a	n/a	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
- Sloping mud with Phormosoma placenta urchins, juvenile holothurian aggregation		

DIVE SUMMARY	
DIVE #	TRANSECT #
487	25

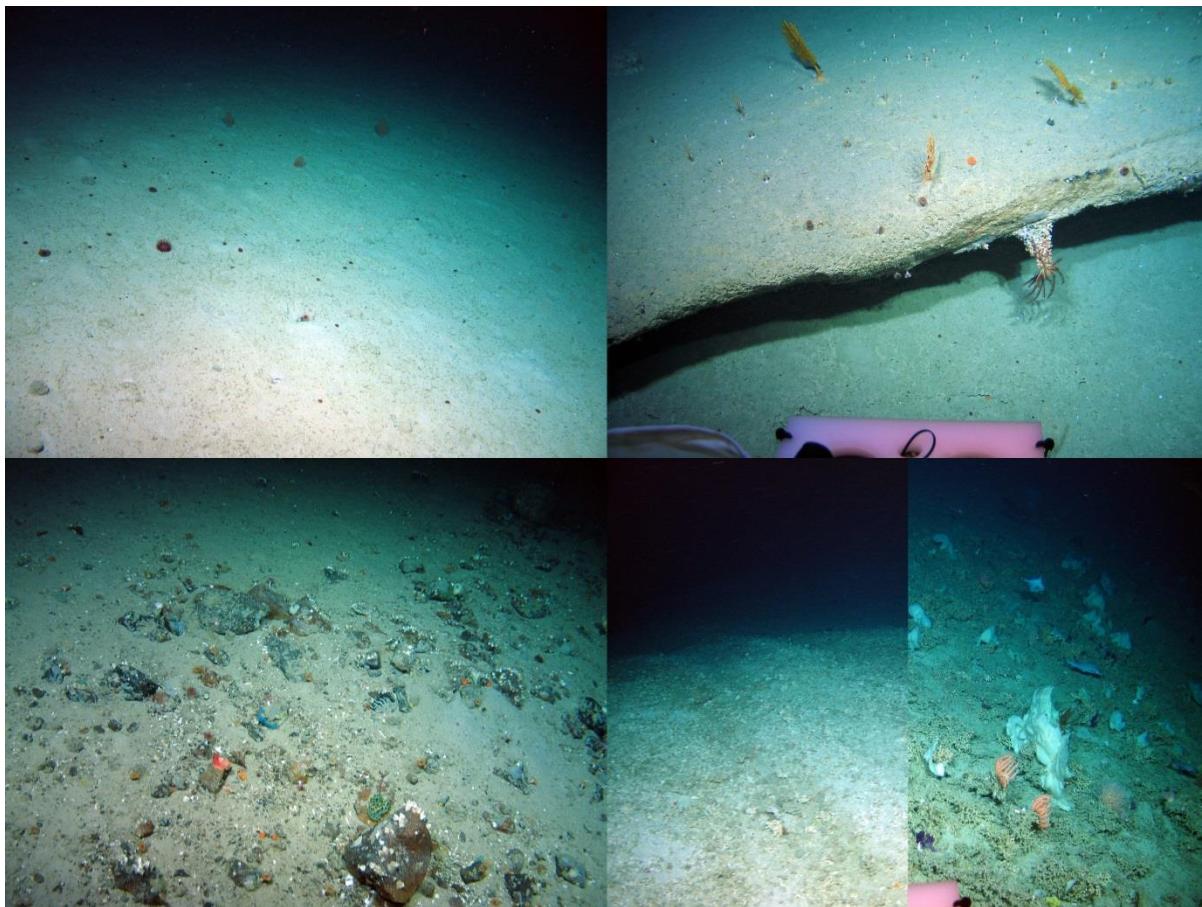
	Start	End
Date & Time	17/07/2017 19:14:49	17/01/2017 22:03:25
Latitude/ Longitude	55.030391, -10.30641017	55.04211083, -10.29297033
Depth	1491.2m	1223.86m
Images	IMG_6839-IMG_7217	
Samples	1x Porifera lamellate sp 12 (OTU1010), 1x pushcore	

Location	C4
Target Features	Canyon, Escarpment [Solenosmilia]
Depth Range	1211.52-1491.77m



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Epifaunally diverse muddy sediment dominates the dive colonised by xenophyophores (*Syringammina fragilissima*) and cup corals at the start/*Acanella arbuscula* at the end (This image containing all of the above representing both M.AtLB.Mu.XenCom.SyrFra/ M.AtLB.Mu.SolScl and M.AtLB.Mu.XenCom.SyrFra/ M.AtLB.Mu.EreCor.AcaArb).

Top R. Several carbonate shelves were encountered early on in the dive, hosting mixed corals such as these *Paramuricea* sp, cup corals and occasional discrete colonies of *Solenosmilia variabilis*. (M.AtLB.Ro.MixCor).

Bottom L. Some areas of pebbles and cobbles were encountered just over half way through the dive. These were dominated by barnacles but other encrusting fauna and corals were also present. ((lower bathyal variant of) M.AtMB.Ro.BarCom).

Bottom R. The half of the dive hosted vast *Solenosmilia variabilis* reef areas, although there was obvious trawl damage. This image composite shows trawl damaged reef on the left, and living reef on the right, easily discernible from the larger framework and more diverse epifauna e.g. lamellate white sponges (OTU1010). (M.AtLB.Co (left), M.AtLB.Bi.CorRee.SolVar (right)).

Summary Description (habitat transitions noted)

VIDEO A 0m/19:14pm [1]: The dive starts on epifaunally diverse soft muddy sediment with xenophyophores (*Syringammina fragilissima*) and cup corals. **16m [2]:** The soft sediment biotope continues but carbonate shelves are periodically encountered hosting mixed corals. **59m [3]:** the muddy substrate starts to display frequent *Acanella arbuscula* together with the xenophyophores (fewer cup corals, although they are still present), the hard substrate transitions from carbonate rock features to sparse/patchy pebbles and cobbles and is dominated by barnacles although many other epifauna are also present. A couple of times the pebble/cobble patches are dense enough to be considered geogenic reef. 1h38m: One orange roughy encountered. **2h6m [4]:** the mud and xenophyophores continue, with patchy *A. arbuscula*, and areas of *Solenosmilia variabilis* coral gravel with sparse fauna, mainly a small orange anemone (OTU605). **2h10m [5]:** The first area of living *Solenosmilia variabilis* biogenic_reef is encountered, with diverse epifauna, on a rolling landscape. Although by **2h11m [6]:** it is clear that it has been trawl damaged with areas of sparse epifauna and clear trawl marks (see especially IMG_7146.jpg). **2h12m [7]:** living reef returns **2h14 [8]:** then trawl damage **2h15m [9]:** then living reef again, although traversing the edge of the damaged reef. **End of VIDEO A at 2h17m/ 21:32pm and start of VIDEO B at 0m/21:33pm.** Between coral reef patches **1m [10]:** *A. arbuscula* and *S. fragilissima* return on muddy sediment. **1m [11]:** coral reef returns and a sponge and push core are sampled. **19m [12]:** mud/coral gravel, Xenophyophores, *A. arbuscula* **20m [13]:** another coral reef patch. **21m [14]:** trawl damage. **23m [15]:** mud and coarse coral rubble patches, and at 24m a rarely encountered large "sofa shark" (*Pseudotriakidae microdon*) **27m [16]:** trawl damaged coral reef **28m [17]:** transition to edge of area with mixed coral gravel/mud with cerianthid anemones and occasional pebbles with barnacles before **HD VIDEO B ends at 30m/22:03pm.**

Physical Data			
Reef (types can be concurrent)	40% reef	21 % geogenic	
		18 % biogeni c	<10% living
			>90% dead
Substrates	<ul style="list-style-type: none"> - boulders (occasional) - carbonate - cobbles - coral gravel - coral reef - mud - pebbles 		
Geomorphology/Features	Canyon <ul style="list-style-type: none"> - boulder - carbonate crust protrusions - carbonate crust shelf - coral reef 		
Annex 1 Types	<ul style="list-style-type: none"> - boulder/cobble fields - coral rubble fields - dead coral structures - sloping/flat bedrock 		
Pressures	8 x plastic litter 2 x fishing line ~10 trawl marks (furrows)		

Biological Data						
Number of Species		104				
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)						
O.T.U.	Name	Growth	SACFOR			
	585 Acanella arbuscula	L	F	917 Hyalonema sp 1 (shortForm)	L	O
	1062 Acesta excavata	M	R	1069 Hydrozoa sp/Ceriantharia sp	L	R
	582 Actinaria sp 18 (sun)	M	R	274 Hymenodiscus coronata/ Brisinga endacanemos	L	O
	605 Actinaria sp 20	M	O	1064 Isididae sp (fine branching)	M	R
	976 Actinaria sp 27	M	R	315 Koehlermetra porrecta	M	R
	930 Actinopterygii sp 3	M	R	305 Leiopathes sp	L	R
	1006 Actinopterygii sp 4	M	R	249 Lepidion eques	L	O
	1066 Adamsia sp (Paguridae Associated)	M	R	1067 Leucoraja sp	L	R
	278 Anthomastus grandiflorus	M	R	273 Lophius piscatorius	L	R
	594 Anthoptilum grandiflorum	M	R	339 Munida tenuimana	M	R
	311 Anthothelia grandiflora	Mass	R	171 Mycale lingua	L	O
	592 Antipatharia sp 4 cf Stauropathes	L	O	973 Nematocrinus sp 1	M	R
	264 Aphrocallistes sp	L	R	563 Neocyttus helgae	L	O
	146 Aphroditidae sp 1	M	R	1063 Neolithodes grimaldii	L	O
	591 Ascidiacea sp (clear)	M	R	1009 Notacanthidae sp 1	L	R
	20 Ascidiacea sp 2	L	O	551 Ophiomorus lymani	L	O
	471 Asteronyx loveni	M	R	1036 Ophioidea sp 11 (red disc)	M	R
	1041 Bathycrinidae sp 1	L	R	205 Paguridae	M	R
	328 Bathypathes sp 1 (brown)	L	O	1065 Paragorgia sp (deep pink)	L	R
	432 Benthogone sp	M	R	1050 Paramurex sp	L	F
	12 Bolocera tuediae	L	O	1042 Parapantides sp	L	O
	6 Caryophyllia sp	M	O	1059 Pennatulacea sp (cf Kophobelemnidae)	L	O
	584 Caryophyllia sp 5 (bullseye)	M	O	436 Pentametrocirrus atlanticus	L	F
	1057 Caryophyllidae sp (tentative)	M	O	255 Phelliactis sp 1	L	O
	1058 Caryophyllidae/Fabellidae (indet)	M	F	555 Phormosoma placentia	M	O
	1111 Cataetyx laticeps	L	R	552 Polyacanthonotus rissoanus	L	O
	2 Ceriantharia sp	M	O	1030 Polymastia of boletiformis	L	O
	1060 cf Haliperis sp	L	O	263 Porania pulvillata	L	O
	486 cf Pennatul phosphorea (deep)	L	O	800 Porifera encrusting (blue)	Crust	R
	1024 Chimera opalescens	L	R	1 1 Porifera encrusting sp 1 (white)	Crust	R
	1008 Chrysogorgiidae	L	O	30 Porifera encrusting sp 10 (yellow)	Crust	O
	1054 Chyrostylidae (indet)	M	R	1010 Porifera lamellate sp 12 (solen Assoc)	L	F
	82 Cirripedia sp	Mass	O	422 Porifera lamellate sp 7	M	R
	303 Coelorrhynchus coelorrhynchus	L	R	606 Porifera lamellate sp 9	L	R
	1059 Colossendeis sp	L	O	648 Porifera massive globose sp 13	L	R
	113 Colus sp	M	R	1051 Porifera massive globose sp 15 (solenoRubbleAssoc)	M	O
	39 Corallimorphidae sp 1	M	O	576 Porifera massive lobose sp 18(cf Farrea sp)	L	R
	577 Coryphaenoides guentheri	L	O	331 Primnoa resedaeformis	L	O
	566 Coryphaenoides rupestris	L	O	433 Pseudarchaster sp 1	M	R
	131 Crinoidea sp 1	M	R	1071 Pseudotriakidae microdon	L	R
	335 Desmophyllum cf dianthus	M	O	652 Rajiformes sp 1 (Neoraja caerulea?)	M	R
	140 Drifa cf glomerata	L	O	41 Sagartiidae sp 3	M	R
	1052 Echinus sp (deep, white/pink)	M	O	106 Serpulidae sp 1	Mass	R
	317 Epizoanthus sp 1 (Paguridae Associated)	M	R	573 Solaster endeca	M	R
	1056 Flabellum sp	M	R	1061 Solasteridae sp (7 arm)	M	R
	1070 Gorgonacea sp (pink, SolenoAssoc)	L	O	700 Solenosmilia variabilis	L	F
	307 Gorgonacea sp 7 (pink) cf Isidella	L	R	569 Squaliformes sp	L	O
	23 Halcampoididae sp	S	R	560 Stichopathes sp	L	O
	208 Henricia sanguinolenta	M	R	361 Styela sp 1	M	R
	628 Holothuroidea sp 4	M	R	440 Synaphobranchus kaupii	L	O
	651 Hoplostethus atlanticus	L	R	261 Syringammina fragilissima	M	C
				1068 Velatida sp 2	M	R
				988 Zoroaster fulgens	L	O
				1083 Pennatula inflata	L	R

Biotope List (Marine Habitat Classification for Britain & Ireland)						
Code	Name	Listed				
M.AtLB.Bi.CorRee.SolVar	Atlantic lower bathyal live <i>Solenosmilia variabilis</i> reef (biogenic structure)	(Solenosmilia variabilis variant of) Lophelia pertusa reefs (OSPAR); Cold-water coral reef (ICES), Solenosmilia variabilis reef (ICES subcategory)				
M.AtLB.Co	Atlantic lower bathyal coarse sediment					
M.AtLB.Co.XenCom.SyrFra a/ M.AtLB.Mu.XenCom.SyrFra	<i>Syringammina fragilissima</i> field on Atlantic lower bathyal coarse sediment/mud	Mud and sand emergent fauna (ICES)				
M.AtLB.Mx	Atlantic lower bathyal mixed sediment					

M.AtLB.Mu.EreCor.AcaAr b	Acanella arbuscula assemblage on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Mu.SolScl	Solitary scleractinian field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Cup- coral fields (ICES subcategory)
(var) M.AtMB.Ro.BarCom	(Lower bathyal variant of) Barnacle dominated community on Atlantic mid bathyal rock and other hard substrata	
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.XenCom.SyrFra/ M.AtLB.Mu.SolScl 1058 Caryophyllidae/Fabellidae (indet), 261 Syringammina fragilissima	
2	M.AtLB.Mu.XenCom.SyrFra/ M.AtLB.Mu.SolScl, (sparse) M.AtLB.Ro.MixCor 1058 Caryophyllidae/Fabellidae (indet), 261 Syringammina fragilissima	
3	M.AtLB.Co.XenCom.SyrFra/ M.AtLB.Mu.EreCor.AcaArb, (sparse, var) M.AtMB.Ro.BarCom 261 Syringammina fragilissima, 585 Acanella arbuscula	
4	M.AtLB.Co.XenCom.SyrFra/ (patchy) M.AtLB.Mu.EreCor.AcaArb, M.AtLB.Co 261 Syringammina fragilissima, 605 Actiniaria sp 20 (orange)	
5	M.AtLB.Bi.CorRee.SolVar 1010 Porifera lamellate sp 12 (Soleno assoc), 700 Solenosmilia variabilis	
6	M.AtLB.Co 1052 Echinus sp (deep, white/pink)	
7	M.AtLB.Bi.CorRee.SolVar 1010 Porifera lamellate sp 12 (Soleno assoc), 700 Solenosmilia variabilis	
8	M.AtLB.Co 1052 Echinus sp (deep, white/pink)	
9	M.AtLB.Bi.CorRee.SolVar 1010 Porifera lamellate sp 12 (Soleno assoc), 700 Solenosmilia variabilis	
10	M.AtLB.Mu.EreCor.AcaArb/ M.AtLB.Co.XenCom.SyrFra 585 Acanella arbuscula , 261 Syringammina fragilissima	
11	M.AtLB.Bi.CorRee.SolVar 1010 Porifera lamellate sp 12 (Soleno assoc), 700 Solenosmilia variabilis	
12	M.AtLB.Mu.EreCor.AcaArb/ M.AtLB.Co.XenCom.SyrFra 585 Acanella arbuscula , 261 Syringammina fragilissima	
13	M.AtLB.Bi.CorRee.SolVar 1010 Porifera lamellate sp 12 (Soleno assoc), 700 Solenosmilia variabilis	
14	M.AtLB.Co 605 Actiniaria sp 20 (orange)	
15	M.AtLB.Mu.EreCor.AcaArb/ M.AtLB.Co.XenCom.SyrFra, M.AtLB.Co 585 Acanella arbuscula , 261 Syringammina fragilissima	
16	M.AtLB.Co 605 Actiniaria sp 20 (orange)	

17	(var) M.AtMB.Ro.BarCom, M.AtLB.Mx 2 Ceriantharia, 82 Cirripedia
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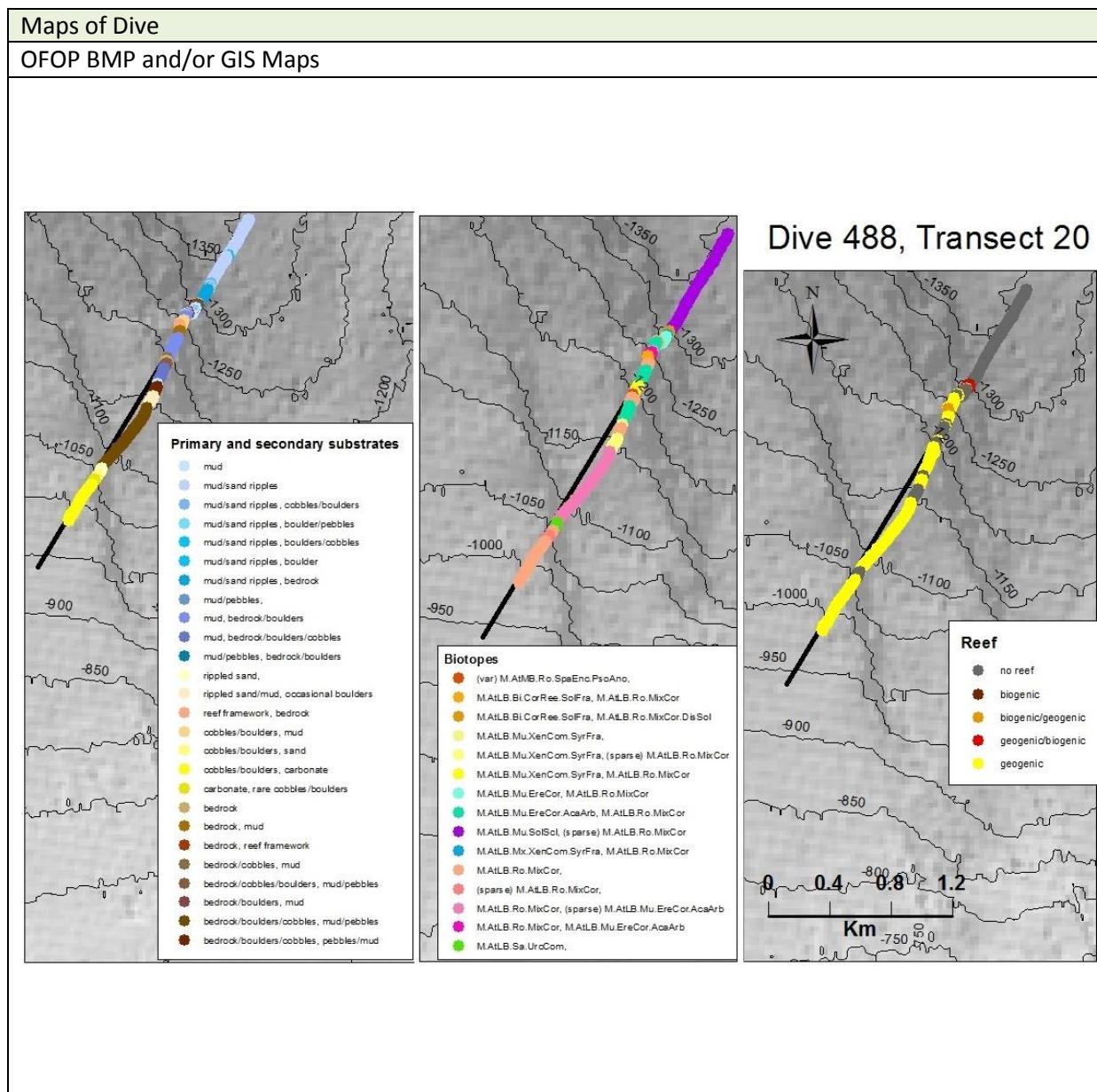
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
(<i>Solenosmilia variabilis</i> variant of) <i>Lophelia pertusa</i> reefs	OSPAR	
Cold-water coral reef	ICES	
- <i>Solenosmilia variabilis</i> reef	ICES subcategory	
Mud and sand emergent fauna	ICES	
Coral gardens	ICES/OSPAR	
- Soft-bottom gorgonian and black coral gardens	ICES subcategory	
- Soft-bottom coral garden: Cup-coral fields	ICES subcategory	
Listed Species Encountered (Fish, Count)		
<i>Hoplostethus atlanticus</i>	1	OSPAR/ IUCN (Vulnerable)

Additional Comments	
<ul style="list-style-type: none"> - Epifaunally diverse sediment (xenophyophores, cup corals, Acanella, urchins), carbonate shelves with mixed corals, cobble patches with barnacles, and <i>Solenosmilia</i> reef with clearly trawled areas and some healthy patches - Image exif timestamps are lagged by ~8-10 seconds after their position on the HD video. - There is a lot of plastic litter on this dive. 	

DIVE SUMMARY	
DIVE #	TRANSECT #
488	20

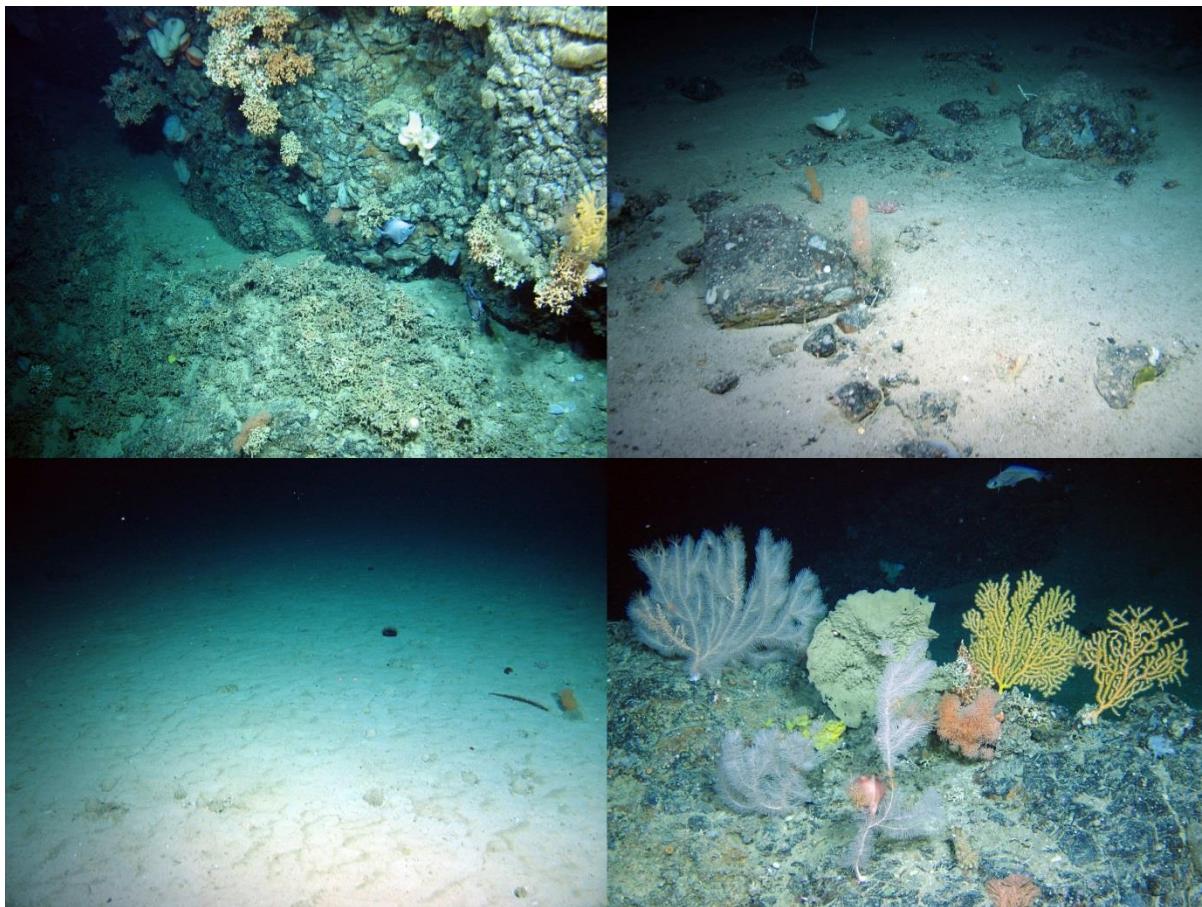
	Start	End
Date & Time	18/07/2017 03:59:04	18/07/2017 08:48:59
Latitude/ Longitude	54.6682135, -10.77680617	54.6489155, -10.7995665
Depth	1302.17	953.32
Images	IMG_7218-IMG_7799	
Samples	3 x sponges, 1x pushcore	

Location	C6
Target Features	Canyon, 2 Escarpments
Depth Range	658.54-1308.41 (av 1193.123)m



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The area of dead *Solenosmilia varabilis* framework on a slope below the pinnacle/stack of bedrock with live *S.varabilis* colonies and mixed corals and sponges. (M.AtLB.Bi.CorRee.SolFra, M.AtLB.Ro.MixCor.DisSol)

Top R. Much of the dive consisted of boulders/cobbles/protruding bedrock of varying density hosting a species rich mixture of encrusting fauna, corals, and sponges (especially lamellate).

Bottom L. Intermediate areas were usually dominated by xenophyophores or erect corals such as *Acanella arbuscula*.

Bottom R. An example of the diversity of coral species encountered on this dive. Dominant species may be misleading on the hard substrate: serpulids or *Psolus squamatus* may dominate as individual species, but the mixed corals and erect sponges are more apparent even though no species is more dominant than another. Large corals and sponges in this image include (from left) cf *Thouarella* sp (grey, OTU1086), a yellow lamellate sponge (OTU623), a dead white lamellate sponge (grey/green, OTU1053), *Chrysogorgiidae* sp (orange bushy, OTU1008), *Solenosmilia varabilis* (orange, OTU700), *Dendrobathyphathes* sp (brown/orange at bottom, OTU1015), *Paramuricea* sp (yellow, OTU1050), *Aphrocallistes cf beatrix* (white, OTU264). (M.AtLB.Ro.MixCor)

Summary Description (habitat transitions noted)

HD VIDEO A 0m/03:59am [1]: The dive starts in a soft bottom coral garden of cup corals on rippled sand. *Acanella arbuscula* and xenophyophores are also present. Rare boulders and cobbles present with mixed corals and encrusting fauna. **49m [2]:** A steep slope and stack-like bedrock outcropping feature host a predominantly dead *Solenosmilia variabilis* reef framework with mixed corals and sponges, and living discrete *S. variabilis* on rock. **1h36m [3]:** low-lying bedrock hosts mixed corals, mosaicked with a larger area of mixed mud/pebbles dominated by xenophyophores. **1h38m [4]:** continues to mud where xenophyophores continue, along with *A. arbuscula*, mixed sea pens, and cup corals. Occasional rocks. **1h42m [5]:** low-lying bedrock hosts mixed corals and erect sponges and is dominated by a lamellate sponge (OTU606) and serpulids among other fauna. **1h48m [6]:** more mud with occasional boulders, again soft substrate corals especially *A. arbuscula* and cup corals, while boulders continue the lamellate sponge and mixed corals assemblage. **1h58m [7]:** dense cobbles and pebbles, with some boulders/protruding bedrock, the same hard bottom assemblage continues. **HD VIDEO A ends 1h59m/05:58am. HD VIDEO B starts 0m/05:59am [8]:** back to boulders and protruding bedrock with (mature) mixed corals and erect sponges interspersed with erect corals on soft sediment. **13m [9]:** a steeper slope displays mixed dead *S. variabilis* framework and bedrock protrusions with mixed corals and sponges (especially *Aphrocallistes* sp) continuing around a large bedrock protrusion. **21m [10]:** traverse along some cliffs, serpulids again dominating, but continued mixed corals/sponges. **33m [11]:** Continuing over the top of the cliffs, soft sediment slope hosts *A. arbuscula* and xenophyophores while occasional boulders/protruding bedrock hosting mature mixed corals and sponges. **46m [12]:** xenophyophores are now dominant, occasional hard substrate as before. **50m [13]:** a *Psolus squamatus* dominated sparse encrusting assemblage occupies a slope of cobbles/boulders/pebbles. **52m [14]:** bedrock cliffs, again dominated by serpulids and mixed mature corals and sponges. The top of the cliffs transitions into a similar assemblage on cobbles/boulders with greater dominance of *P. squamatus*, but the mixed corals and sponges continue. **1h31m [15]:** patchy hard substrate continues with smaller corals and sponges, while sparse *A. arbuscula* dominates intermediate areas of mud. **1h47m [16]:** an extended area of xenophyophores on mud. **1h49m [17]:** bedrock protrusions continuing into a cobble/boulder field host again mature mixed corals and sponges, especially lamellate sponges. **HD VIDEO B ends 2h00m/07:59am. HD VIDEO C starts 0m/08:00am. [17 ctd]. 2m [18]:** another extended area of xenophyophores and soft sediment with sparse rock substrate. **6m [19]:** dense cobbles boulders, then cobbles/boulders on flat mud, again host mixed corals and sponges and encrusting community with *A. arbuscula* sparsely interspersed. **28m [20]:** rippled sand begins as the slope inclines, occasional urchins and fish species dominate. **30m [21]:** dense cobbles/boulders on sand slope/carbonate crust slope/ mixed/coarse sediment plateau continue the mixed coral and sponge assemblage. **VIDEO C ends 48m/08:48am.**

Physical Data			
Reef (types can be concurrent)	72% reef	72% geogenic	
		19%	99% dead
		biogenic	1 % living
Substrates	<ul style="list-style-type: none"> - Bedrock - Boulders - Carbonate - Cobbles - Mud - Pebbles - Reef framework - Rippled sand 		
Geomorphology/Features	<p>Canyon</p> <ul style="list-style-type: none"> - Bedrock cliffs - Bedrock mound - Bedrock outcroppings - Bedrock stack - Carbonate crust - Cobbles & boulders <p>Escarpmment</p> <ul style="list-style-type: none"> - Carbonate crust - Cobbles & boulders <p>Canyon plateau</p> <ul style="list-style-type: none"> - Carbonate crust - Cobbles & boulders 		
Annex 1 Types	<ul style="list-style-type: none"> - Cobble boulder field - Dead coral structures - Horizontal bedrock - Pinnacle - Sloping bedrock - Vertical bedrock - Vertical rock walls 		
Pressures	<ul style="list-style-type: none"> - 2 x plastic - 2 x fishing line - 1 x metal - 1 x wood (?) 		

Biological Data			
Number of Species	137 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U.	Name	Size	SACFOR
585	<i>Acanella arbuscula</i>	L	F
1062	<i>Acesta excavata</i>	M	O
554	<i>Actinermus sp</i>	L	O
4	<i>Actinaria sp 1</i>	M	R
582	<i>Actinaria sp 18 (sun)</i>	M	O
605	<i>Actinaria sp 20</i>	S	R
930	<i>Actinoptenigii sp 3</i>	M	R
1006	<i>Actinoptenigii sp 4</i>	M	R
1047	<i>Actinocyphidae sp 1 (pink)</i>	L	O
132	<i>Actinostolidae sp 1</i>	L	O
1066	<i>Adamsia sp (Paguridae Associated)</i>	M	R
278	<i>Anthomastus grandiflorus</i>	M	O
311	<i>Anthothelia grandiflora</i>	Mass	R
592	<i>Antipatharia sp 4 cf Stauropathes</i>	L	O
1097	<i>Aphanopsis carbo</i>	L	O
264	<i>Aphrocallistes sp</i>	L	F
146	<i>Aphroditidae sp 1</i>	M	R
1082	<i>Apriistus profundorum</i>	L	R
188	<i>Araeosoma fenestratum</i>	L	O
20	<i>Ascidacea sp 2</i>	M	O
1038	<i>Asconema sp</i>	L	O
471	<i>Asteronyx loveni</i>	M	R
1041	<i>Bathycriinidae sp 1</i>	L	R
12	<i>Bolocera tuediae</i>	L	O
267	<i>Bonellia viridis</i>	M	R
34	<i>Brachiopoda</i>	S	R
258	<i>Brosme brosme</i>	L	O
280	<i>Callogorgia verticillata</i>	L	R
1077	<i>Caridea (indet)</i>	M	R
584	<i>Caryophyllia sp 5 (bullseye)</i>	M	O
1057	<i>Caryophyllidae sp (tentative)</i>	S	O
1058	<i>Caryophyllidae/Fabellidae (indet)</i>	M	O
1048	<i>Centrophorus squamosus</i>	L	R
234	<i>Ceramaster/Peltaster/Plinthaster sp 1</i>	M	R
2	<i>Ceriantharia</i>	S	R
1060	<i>Haliperis sp</i>	L	F
1084	<i>Pheromena sp (Rock poss Aphorme horrida)</i>	L	O
1086	<i>cf Thouarella sp</i>	L	O
653	<i>Chimera opalescens (correct)</i>	L	R
1054	<i>Chrostyliidae (indet)</i>	M	R
1008	<i>Chrysogorgiidae sp 1</i>	L	F
540	<i>Chrysopathes sp/Trissopathes sp</i>	L	R
211	<i>Cidaris cidaris</i>	M	O
1092	<i>Cidaris sp (deep)</i>	M	R
82	<i>Cirripedia sp</i>	Mass	O
1059	<i>Colosendeis sp</i>	L	O
113	<i>Colus sp</i>	M	R
577	<i>Coryphaenoides quenneri</i>	L	F
566	<i>Coryphaenoides rupestris</i>	L	O
128	<i>Cottunculus microps</i>	L	R
1072	<i>Crinoidea sp (10 arm)</i>	L	R
131	<i>Crinoidea sp 1</i>	M	F
131	<i>Crinoidea sp 1 (red)</i>	M	R
1015	<i>Dendrobathyphathes (prev Stauropathes sp 1)</i>	L	O
335	<i>Desmophyllum cf dianthus</i>	M	R
1094	<i>Echinothuroidea sp (purple)</i>	L	O
445	<i>Echinus sp 1</i>	M	O
649	<i>Eknomisis sp</i>	L	O
1093	<i>Enallopammia sp (?)</i>	L	R
1056	<i>Flabellum sp</i>	M	R
1005	<i>Galeus melastomus</i>	L	O
307	<i>Gorgonacea sp 7 (pink) cf Isidella</i>	L	O
214	<i>Gorgonocephalus sp 1</i>	L	O
208	<i>Hericia sanguinolenta</i>	M	R
628	<i>Holothuroidea sp 4</i>	M	R
651	<i>Hoplostethus atlantica</i>	L	R
917	<i>Hyalonema sp 1</i>	L	O
1024	<i>Hydrolagus cf mirabilis</i>	L	R
1069	<i>Hydrozoa sp/Ceriantharia sp</i>	L	R
274	<i>Hymenodiscus coronata/ Brisinga endacnemos</i>	L	O
1078	<i>Ipnopidae sp</i>	M	R
1064	<i>Isididae sp (fine branching)</i>	L	O
305	<i>Leiopathes sp</i>	L	O
249	<i>Lepidion eques</i>	L	F
1055	<i>Liponema sp</i>	L	R
1089	<i>Lophaster furcifer</i>	M	R
11	<i>Majidae sp 1</i>	S	R
277	<i>Margarites sp 1</i>	S	R
654	<i>Molva molva</i>	L	O
349	<i>Mura moro</i>	L	R
339	<i>Munda tenuimana</i>	M	O
171	<i>Mycale lingua</i>	L	O
1026	<i>Mysida (indet)</i>	S	R
563	<i>Neocytthus helgae</i>	L	O
1009	<i>Notacanthidae sp 1</i>	L	O
1087	<i>Novodinia sp</i>	L	O
1076	<i>Ophuroidea (indet)</i>	S	R
1036	<i>Ophuroidea sp 11 (red disc)</i>	M	R
340	<i>Ophuroidea sp 7 (red)</i>	M	R
918	<i>Opisthotethis extensa</i>	M	R
205	<i>Paguridae</i>	M	R
1065	<i>Paragorgia sp (twiggy)</i>	L	O
1050	<i>Paramuncea sp</i>	L	F
1046	<i>Pennatula sp (deep)</i>	L	O
1059	<i>Pennatulacea sp (cf Kophobelemnidae)</i>	L	O
436	<i>Pentametrocirrus atlanticus</i>	L	O
202	<i>Phakellia ventillabrum</i>	L	O
1081	<i>Phanopathes sp</i>	L	O
255	<i>Phelliactis sp 1</i>	L	O
555	<i>Phormosoma placentia</i>	M	R
1020	<i>Phycis blennoides</i>	L	O
552	<i>Polyacanthonotus rissoanus</i>	L	R
1091	<i>Porifera branching glassy</i>	L	O
535	<i>Porifera cup 2</i>	L	O
800	<i>Porifera encrusting (blue)</i>	Crust	R
9	<i>Porifera encrusting (orange)</i>	Crust	R
30	<i>Porifera encrusting sp 10 (yellow)</i>	Crust	R
623	<i>Porifera lamellate sp 10 (Yellow/SolenAssoc)</i>	L	F
1010	<i>Porifera lamellate sp 12 (solen Assoc)</i>	L	F
1053	<i>Porifera lamellate sp 13</i>	L	F
606	<i>Porifera lamellate sp 9</i>	L	F
1051	<i>Porifera massive globose sp 15 (solenRubbleAssoc)</i>	M	R
137	<i>Porifera massive globose sp 6</i>	M	R
380	<i>Porifera tubular (cf Asconema foliatum)</i>	L	F
331	<i>Primnoa resedaeformis</i>	L	O
1058	<i>Primnoidae sp (greyDelicate, may also be cf Thouarella 1086)</i>	L	O
433	<i>Pseudarchaster sp 1</i>	M	R
252	<i>Psolus squamatus</i>	M	F
1080	<i>Pseudoanthomastus sp</i>	L	O
652	<i>Rajiformes sp 1 poss Neoraja caerulea</i>	L	O
1079	<i>Rhodaliidae sp</i>	M	R
1095	<i>Sepiolidae sp</i>	M	R
106	<i>Serpulidae sp 1</i>	M	F
700	<i>Solenosmilia variabilis</i>	L	F
569	<i>Squaliformes (Etmopteridae?)</i>	L	O
198	<i>Stichastrella rosea</i>	M	R
560	<i>Stichopathes sp</i>	L	O
361	<i>Styela sp 1</i>	L	F
440	<i>Synaphobranchus kaupii</i>	L	F
261	<i>Syringammina fragilissima</i>	M	C
581	<i>Umbellula sp</i>	L	R
1073	<i>Unknown annelida or foraminifera</i>	S	O
532	<i>Unknown sp 26 (Sabellidae?)</i>	Mass	O
199	<i>Velatida sp 1</i>	M	R
586	<i>Zoanthidea sp 2</i>	Mass	O
291	<i>Zoarcidae sp 2</i>	L	O
988	<i>Zoroaster fulgens</i>	L	O

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
M.AtLB.Bi.CorRee.SolFra	Mixed coral assemblage on Atlantic lower bathyal <i>Solenosmilia</i> reef framework (biogenic structure)	(<i>Solenosmilia variabilis</i> variant of) <i>Lophelia pertusa</i> reefs (OSPAR); Cold-water coral reef (ICES), <i>Solenosmilia variabilis</i> reef (ICES subcategory)
M.AtLB.Mu.EreCor.AcaArb	<i>Acanella arbuscula</i> assemblage on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)

M.AtLB.Mu.SolScl	Solitary scleractinian field on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Cup-coral fields (ICES subcategory)
M.AtLB.Mu.XenCom.SyrFra and M.AtLB.Mx.XenCom.SyrFra	<i>Syringammina fragilissima</i> field on Atlantic lower bathyal mud/mixed sediment	Mud and sand emergent fauna (ICES)
M.AtLB.Ro.MixCor.DisSol	Discrete <i>Solenosmilia variabilis</i> colonies on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Sa.UrcCom	Urchin dominated community on Atlantic lower bathyal sand	
(var) M.AtMB.Ro.SpaEnc.PsoAn o	(lower bathyal variant of) <i>Psolus squamatus</i> , Anomiidae, serpulid polychaetes and <i>Munida</i> on Atlantic mid bathyal rock and other hard substrata	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Mu.SolScl, (sparse) M.AtLB.Ro.MixCor 1058 Caryophyllidae/Fabellidae (indet)	
2	M.AtLB.Bi.CorRee.SolFra, M.AtLB.Ro.MixCor.DisSol 700 <i>Solenosmilia varabilis</i> , 623 Porifera lamellate sp 10 (YellowSolenoAssoc)	
3	M.AtLB.Mx.XenCom.SyrFra, M.AtLB.Ro.MixCor 261 <i>Syringammina fragilissima</i>	
4	M.AtLB.Mu.EreCor.AcaArb, M.AtLB.Ro.MixCor 585 <i>Acanella arbuscula</i>	
5	M.AtLB.Ro.MixCor 606 Porifera lamellate sp 9, 106 Serpulidae sp 1	
6	M.AtLB.Mu.EreCor.AcaArb, M.AtLB.Ro.MixCor 585 <i>Acanella arbuscula</i> , 606 Porifera lamellate sp 9	
7	M.AtLB.Ro.MixCor 606 Porifera lamellate sp 9	
8	M.AtLB.Ro.MixCor, M.AtLB.Mu.EreCor.AcaArb 606 Porifera lamellate sp 9, 585 <i>Acanella arbuscula</i>	
9	M.AtLB.Bi.CorRee.SolFra, M.AtLB.Ro.MixCor 264 <i>Aphrocallistes</i> sp, 623 Porifera lamellate sp 10 (YellowSolenoAssoc)	

10	M.AtLB.Ro.MixCor 106 Serpulidae sp 1, 606 Porifera lamellate sp 9
11	M.AtLB.Mu.EreCor.AcaArb, M.AtLB.Ro.MixCor 585 Acanella arbuscula
12	M.AtLB.Mu.XenCom.SyrFra, M.AtLB.Ro.MixCor 261 Syringammina fragilissima
13	(var) M.AtMB.Ro.SpaEnc.PsoAno 252 Psolus squamatus
14	M.AtLB.Ro.MixCor 107 Serpulidae sp 1, 252 Psolus squamatus
15	M.AtLB.Mu.EreCor.AcaArb, M.AtLB.Ro.MixCor 585 Acanella arbuscula, 252 Psolus squamatus
16	M.AtLB.Mu.XenCom.SyrFra 261 Syringammina fragilissima, 582 Actiniaria sp 18 (sun)
17	M.AtLB.Ro.MixCor 1053 Porifera lamellate sp 13
18	M.AtLB.Mu.XenCom.SyrFra, (sparse) M.AtLB.Ro.MixCor 261 Syringammina fragilissima
19	M.AtLB.Ro.MixCor, (sparse) M.AtLB.Mu.EreCor.AcaArb 106 Serpulidae sp1, 585 Acanella arbuscula
20	M.AtLB.Sa.UrcCom 188 Araeosoma fenestratum
21	M.AtLB.Ro.MixCor 252 Psolus squamatus, 532 Unknown sp 26 (Sabellidae?), 1053 Porifera lamellate sp 13, 264 Aphrocallistes sp, 1050 Paramuricea sp

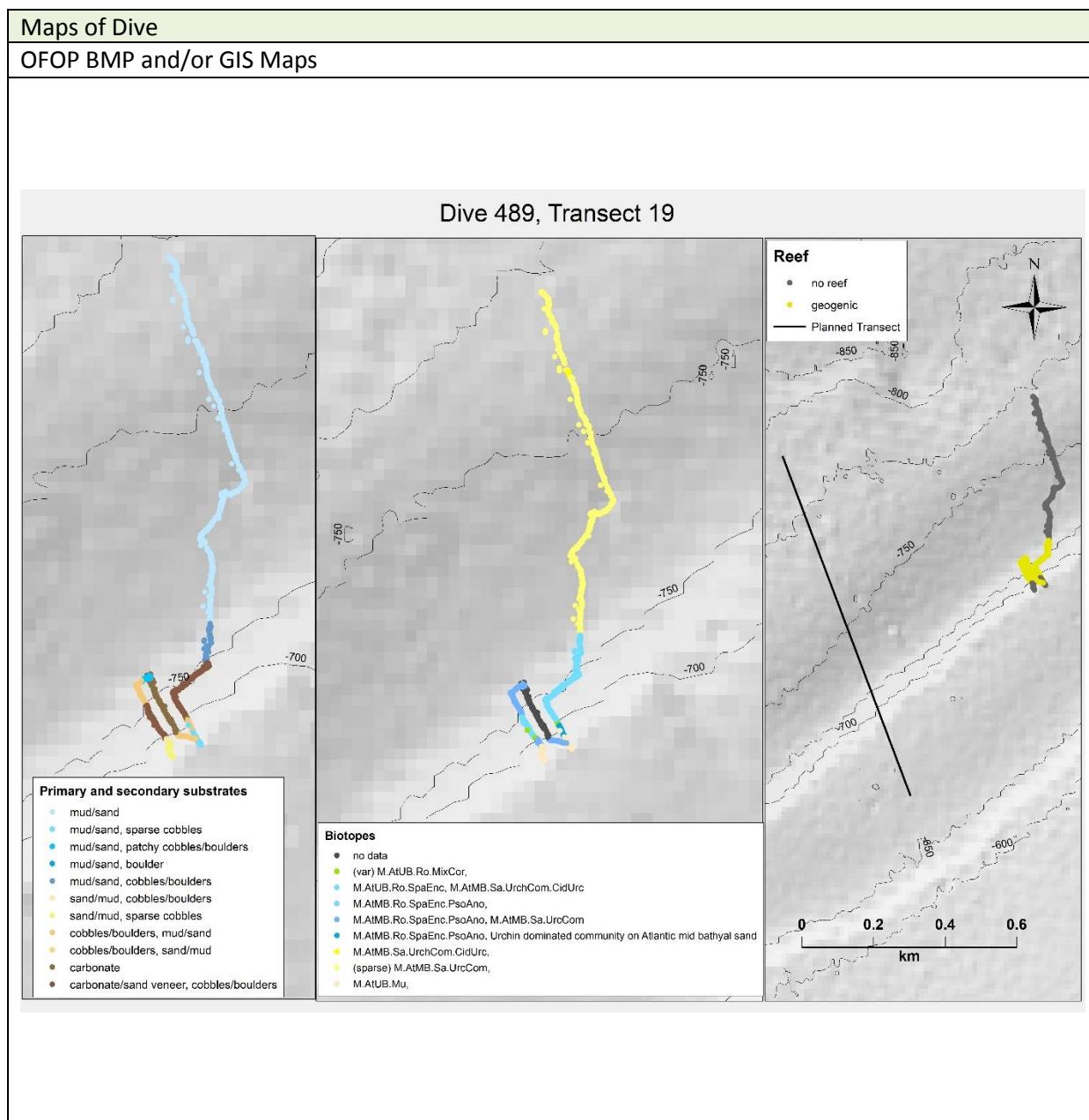
Conservation Targets	
Listed Habitats Encountered	
Name	Authority
(Solenosmilia variabilis variant of) Lophelia pertusa reefs	OSPAR
Cold-water coral reef	ICES
- Solenosmilia variabilis reef	ICES subcategory
Coral gardens	ICES/OSPAR
- Hard-bottom coral garden	ICES subcategory
○ Hard-bottom gorgonian and black coral gardens	ICES subcategory
○ Colonial scleractinians on rocky outcrops	ICES subcategory
- Soft-bottom coral garden	ICES subcategory
○ Cup-corals fields	ICES subcategory
○ Soft-bottom gorgonian and black coral gardens	ICES subcategory
Mud and sand emergent fauna	ICES
Listed Species Encountered (Fish, Count)	
<i>Hoplostethus atlanticus</i>	1
<i>Centrophorus squamosus</i>	1
IUCN/ OSPAR	

Additional Comments		
- This is the most species rich transect (137 spp recorded) with many types of coral and sponge present.		

DIVE SUMMARY	
DIVE #	TRANSECT #
489	19

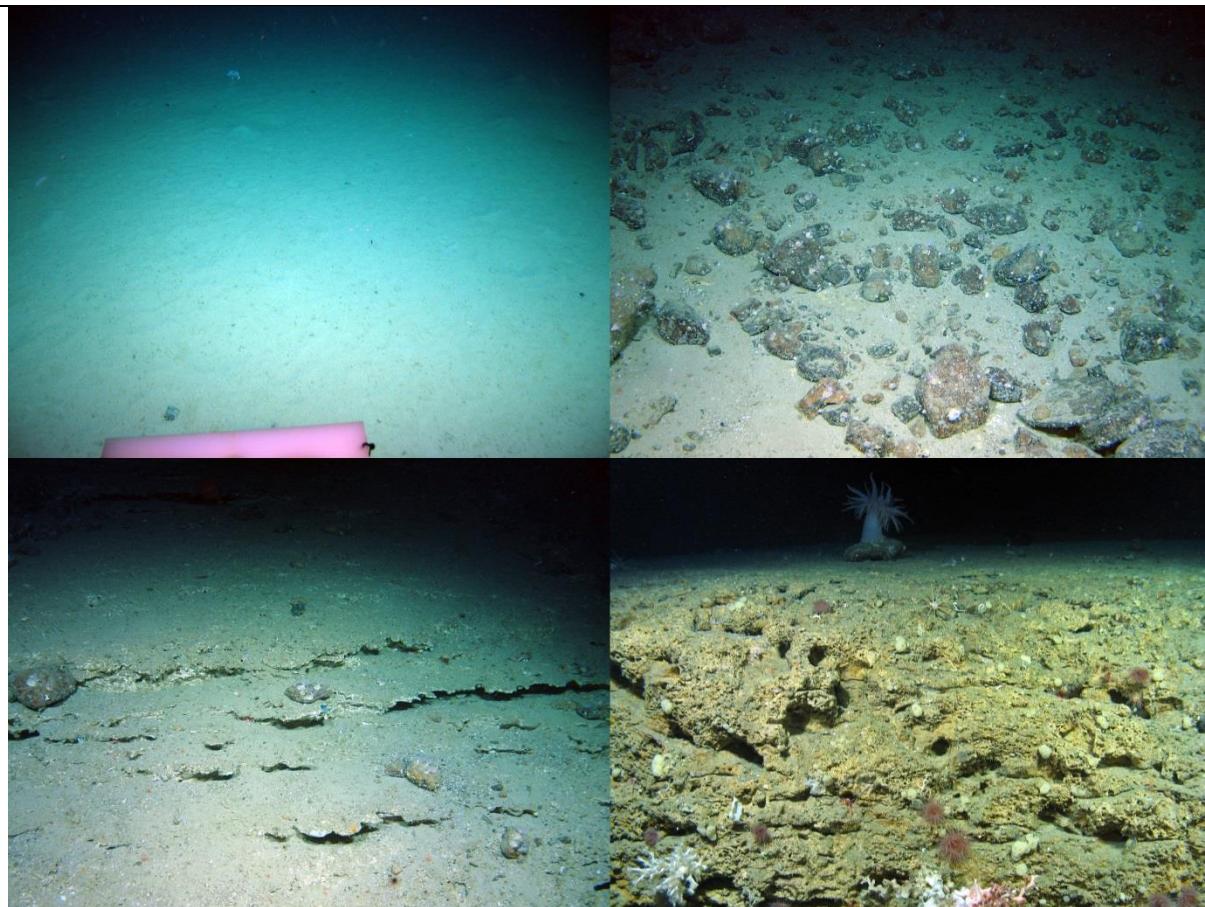
	Start	End
Date & Time	18/07/2017 14:35:06	18/07/2017 15:10:47
Latitude/ Longitude	54.50097833, -11.16929983	54.4990955, -11.16856667
Depth	735.99	645.35
Images	IMG_7800-IMG_7867.JPG	
Samples	n/a	

Location	Between C6 and C7
Target Features	Escarpment
Depth Range	643.43m-746.75m (av. 705.631m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Most of the first hour passes over soft sediment with sparse epifauna or urchins. Many fish species are encountered here however. ((sparse) M.AtMB.Sa.UrcCom)

Top R. Cobbles and boulders were encountered throughout the dive, being especially dense at the base of the escarpment feature. They are colonised by the sedentary holothurian *Psolus squamatus* and sparse encrusting fauna. (M.AtMB.Ro.SpaEnc.PsoAno)

Bottom L. Layered sloping carbonate crust forming shelf features forms the majority of the escarpment feature at differing angles of steepness. The sand veneer hosts *Cidaris cidaris* urchins, while sparse/patchy cobbles again host *Psolus squamatus*. Exposed carbonate is also sparsely encrusted but *P. squamatus* is effectively absent on this substrate. (M.AtMB.Sa.UrcCom.CidUrc, M.AtMB.Ro.SpaEnc.PsoAno)

Bottom R. The top of the larger carbonate cliff feature towards the top of the escarpment hosted a mixed coral escarpment/overhang community as seen on other dives on this escarpment. Here pink/purple anemones (OTU478) is the most abundant here, with rare *Lophelia pertusa* colonies and abundant encrusting globose porifera (OTU75). The deeplet anemone *Bolocera tuediae* can be seen in the background and was encountered frequently throughout this transect. ((var) M.AtUB.Ro.MixCor)

Summary Description (habitat transitions noted)

START OF HD VIDEO A 0m/12:24pm [1] The transect starts on an extended area of relatively flat mud/sand with rare burrows and sparse urchins. **13m [2]** This area sees an abundance of *Cidaris cidaris* in particular before again at **14m [3]** becoming mixed and sparse urchins with little epifauna. here there are many fish species encountered, often small in size/juvenile, including two leafscale gulper shark (*Centrophorus squamosus*). 33m ROV makes a slight right turn then 34m starts moving diagonally right. 36m moves forward, 37 moves diagonally left. 38m forward. **59m [4]** The bottom of the escarpment feature presents with cobbles and boulders sparsely encrusted and dominated by *Psolus squamatus* (although these are sparse at first), there are also several *Bolocera tuediae* anemones here, with more encountered throughout the dive. 1h03m one large boulder in the cobble/boulder field is dominated by barnacles, those surrounding hosting *P.squamatus*. 1h12m carbonate crust with sand veneer, presenting as a slope with crust layers, cobbles/boulders continue with *P.squamatus*. 1h15m start moving right. 1h24m-1h25m stop for zooming. 1h27m ROV moves forward upslope. **1h28m [5]** Vertical carbonate transitioning into steeply sloping carbonate, sometimes layered. This is sparsely encrusted mostly with encrusting sponges and serpulids. Various types of anemone are also present. *Cidaris cidaris* is one of the dominant species visible, associated with the sand veneer. Rare cobbles again host *P.squamatus*. 1h35m a couple of large broken carbonate crust boulders preceed another layered slope with many broken carbonate rocks. **1h38m [6]** A higher cliff of vertical carbonate hosts the overhang/escarpment community seen on other dives, here dominated by pink/purple anemones (OTU478) and encrusting globose porifera (OTU75) along with a couple of small *Lophelia pertusa* colonies. The ROV stops to image a *Bolocera tuediae* anemone perched on a cobble at the top of this feature. 1h41m continue forwards. **1h42m [7]** a small ledge marks the top of the escarpment with dense cobbles and boulders gradually thinning with the sand/mud veneer deepening. *P.squamatus* is particularly dense and urchins are common especially *Araeosoma fenestratum*. **1h45m [8]** mud/sand with rare cobbles, the ROV proceeds forwards until 1h47m when it traverses left then stops. 1h49m the ROV reverses backwards again **1h51m [9]** meeting the cobbles and boulders, then heading over the small ledge and losing sight of the seabed. **1h54m [10]** The ROV moves through blue water until the **END OF HD VIDEO A 1h58m/14:23pm**. The blue water transit continues until ~14:29 when the first OFOP records suggest the seabed is reacquired. **HD VIDEO B STARTS 0m/14:35pm [11]** on the seabed in an area of patchy cobbles and boulders. The ROV stay s stationary, zooming until 3m when it starts moving right. *A. fenestratum* is the most abundant urchin species occupying intermediate sediment patches. 5m ROV starts moving forwards now over dense cobbles and boulders with *P.squamatus*, 12m reaching the carbonate crust/cobble/boulder region. **14m [12]** Vertical carbonate again is sparsely encrusted transitioning to a steep sloping/layered carbonate with a few mixed anemone species too. **24m [13]** The top vertical carbonate cliff is again dominated by the pink/purple anemone (OTU478) and encrusting globose porifera (OTU75).**26m [14]** the small shelf topped with cobbles and boulders again marks the top of the escarpment, and **30m [15]** transitions to sand/mud with sparse epifauna, most notably the Actiniidae anemones akin to a sand-dwelling Bolocera (OTU41). **HD VIDEO B ENDS 35m/15:10pm.**

Physical Data					
Reef (types can be concurrent)	53% reef	53 % geogenic			
		n/a	n/a		
Substrates		<ul style="list-style-type: none"> - Boulders - Carbonate - Cobbles - Mud/sand - Sand veneer 			
Geomorphology/Features	<p>Escarpment</p> <ul style="list-style-type: none"> - cliff/ledge - cobble/boulder field - large broken carbonate boulders - ledge - sloping/layered carbonate crust - terraced/steep layered carbonate <p>Shelf</p>				
Annex 1 Types	<ul style="list-style-type: none"> - Cobble/boulder field - horizontal rock - sloping rock - vertical rock 				
Pressures	<ul style="list-style-type: none"> - 5 x plastic - 1 x fishing line 				

Biological Data				
Number of Species		63 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U	Name	size/growth	SACFOR	
4	Actiniaria sp 1	M	R	
478	Actiniaria sp 13 (pink/purple)	M	R	
605	Actiniaria sp 20	M	O	
907	Actiniaria sp 24	M	R	
41	Actiniidae sp (sandBolocera)	M	F	
930	Actinopterygii sp 3	M	R	
1074	Alepocephaliformes sp 1 cf Rouleina attrit	L	R	
32	Anomiidae sp 1	Mass	F	
278	Anthomastus grandiflorus	M	R	
1097	Aphanopus carbo	L	R	
188	Araeosoma fenestratum	L	F	
12	Bolocera tuediae	L	R	
267	Bonellia viridis	M	R	
258	Brosme brosme	L	O	
1077	Caridea (indet)	M	R	
6	Caryophyllia sp	M	R	
1048	Centrophorus squamosus	L	O	
388	Ceremaster/Peltaster/Plinthaster sp 2	M	O	
2	Ceriantharia	M	O	
400	cf Edwardsiidae/ Halcampoididae/ Halocynthia sp	S	R	
265	Chimaera monstrosa	L	R	
211	Cidaris cidaris	M	F	
82	Cirripedia sp	Mass	R	
303	Coelorhynchus coelorhynchus	L	R	
113	Colus sp	M	R	
39	Corallimorphidae sp 1 (dark)	M	O	
43	Corallimorphidae sp 2 (pale)	M	R	
566	Coryphaenoides rupestris	L	R	
131	Crinoidea sp 1	M	R	
335	Desmophyllum cf dianthus	M	R	
445	Echinus sp 1	M	R	
1018	Epigonus telescopus	L	R	
317	Epizoanthus sp 1 (Paguridae Associated)	M	R	
23	Halcampoididae sp 1	S	O	
227	Helicolenus dactylopterus	L	O	
1024	Hydrolagus cf mirabilis	L	R	
274	Hymenodiscus coronata/ Brisinga endeca	L	O	
249	Lepidion eques	L	O	
250	Lophelia pertusa	L	O	
251	Madrepora oculata	L	O	
1019	Merlangius merlangus	L	O	
349	Mora moro	L	O	
200	Murida sarsi	M	R	
1003	Nezumia aequalis	L	R	
458	Pachycerianthus multiplacatus	M	R	
205	Paguridae spp	M	R	
304	Paramola cuvieri	L	O	
255	Phelliactis sp 1	L	R	
1020	Phycis blennoides	L	R	
207	Pliobrothus sp	M	R	
552	Polyacanthonotus rissoanus	L	R	
118	Porifera encrusting (black/red)	Crust	R	
800	Porifera encrusting (blue)	Crust	R	
75	Porifera encrusting globose (pale)	Mass	O	
1	Porifera encrusting sp 1 (white)	Crust	O	
30	Porifera encrusting sp 10 (yellow)	Crust	R	
1101	Porifera lamellate (escarp)	M	R	
252	Psolus squamatus	M	F	
204	Reteporella sp 1	M	O	
1134	Scyphozoa sp (indet)	M	R	
106	Serpulidae sp 1	M	O	
198	Stichastrella rosea	M	R	
440	Synaphobranchus kaupii	L	F	

Biotope List (Marine Habitat Classification for Britain & Ireland)				
Code	Name	Listed		
(var) M.AtUB.Ro.MixCor	(canyon/escarpment variant) Mixed cold water coral community on Atlantic upper bathyal rock and other hard substrata	Not enough corals in this instance.		
M.AtMB.Ro.SpaEnc.PsoAn	Psolus squamatus, Anomiidae, serpulid polychaetes and Munida on Atlantic mid bathyal rock and other hard substrata			

M.AtMB.Sa.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic mid bathyal sand	
M.AtMB.Sa.UrcCom	Urchin dominated community on Atlantic mid bathyal sand	
M.AtUB.Mu	Atlantic upper bathyal mud	
M.AtUB.Ro.SpaEnc	Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(sparse) M.AtMB.Sa.UrcCom (sparse) 188 Araeosoma fenestratum, 211 Cidaris cidaris	
2	M.AtMB.Sa.UrcCom.CidUrc 211 Cidaris cidaris	
3	(sparse) M.AtMB.Sa.UrcCom (sparse) 188 Araeosoma fenestratum, 211 Cidaris cidaris	
4	M.AtMB.Ro.SpaEnc.PsoAno 106 Serpulidae sp, 252 Psolus squamatus	
5	M.AtUB.Ro.SpaEnc, M.AtMB.Sa.UrcCom.CidUrc Encrusting sponges, 2 Cerianthidae sp, 211 Cidaris cidaris	
6	(var) M.AtUB.Ro.MixCor 478 Actiniaria sp 13 (pink/purple), 75 Porifera encrusting globose	
7	M.AtMB.Ro.SpaEnc.PsoAno, M.AtMB.Sa.UrcCom 252 Psolus squamatus, 188 Araeosoma fenestratum	
8	M.AtUB.Mu 41 Actiniidae sp	
9	M.AtMB.Ro.SpaEnc.PsoAno, M.AtMB.Sa.UrcCom 252 Psolus squamatus, 188 Araeosoma fenestratum	
10	Blue water n/a	
11	M.AtMB.Ro.SpaEnc.PsoAno, M.AtMB.Sa.UrcCom Encrusting sponges, 252 Psolus squamatus, 188 Araeosoma fenestratum, 211 Cidaris cidaris	
12	M.AtUB.Ro.SpaEnc, M.AtMB.Sa.UrcCom.CidUrc Encrusting sponges, 2 Cerianthidae sp, 211 Cidaris cidaris	
13	(var) M.AtUB.Ro.MixCor 75 Porifera encrusting globose, 478 Actiniaria sp 13 (pink/purple)	
14	M.AtMB.Ro.SpaEnc.PsoAno, M.AtMB.Sa.UrcCom 252 Psolus squamatus, 188 Araeosoma fenestratum	
15	M.AtUB.Mu 41 Actiniidae sp	

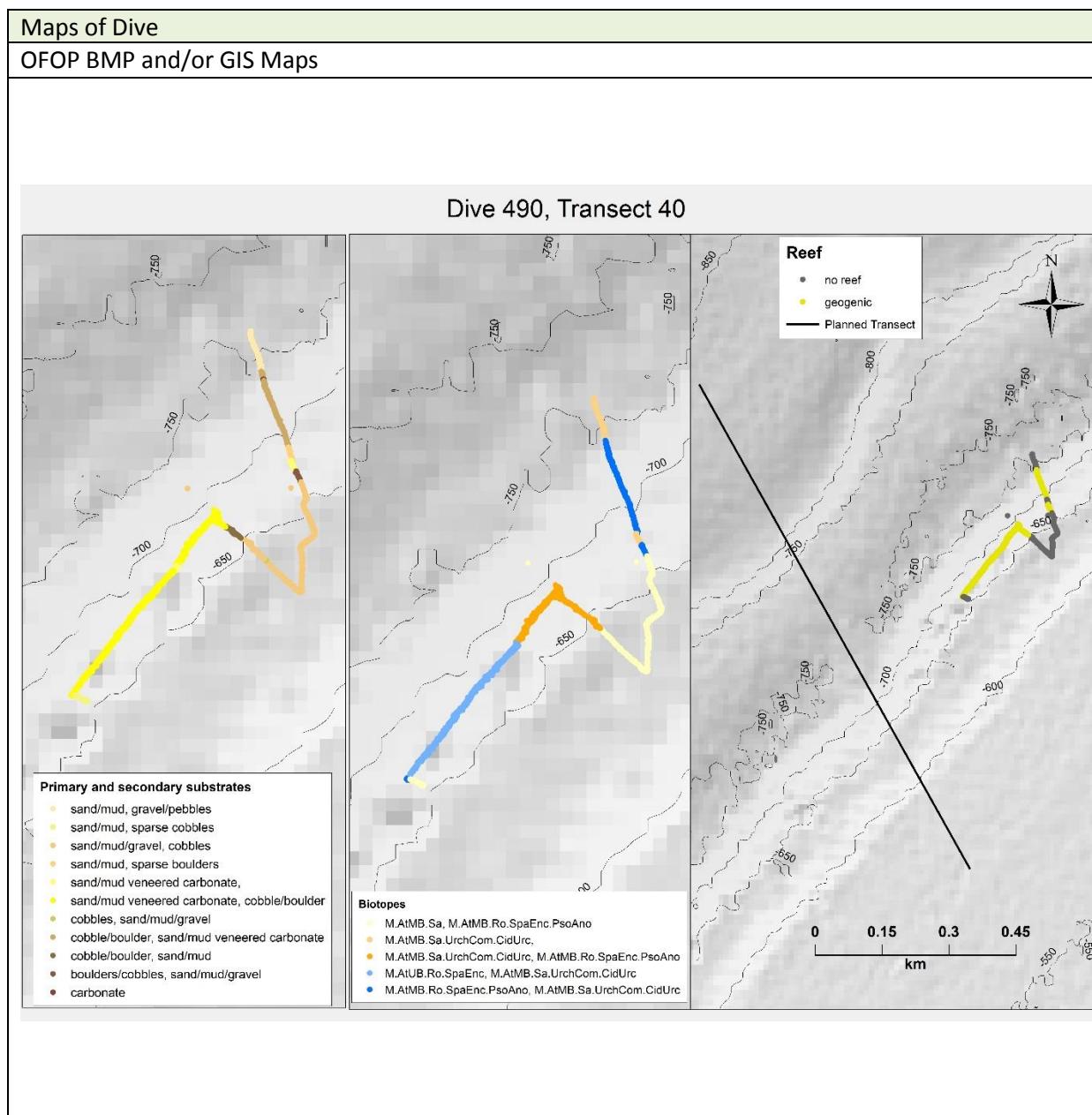
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
The canyon overhang community does not consist of enough corals in this case to count.		
Listed Species Encountered (Fish, Count)		
<i>Centrophorus squamosus</i>	2	IUCN/ OSPAR

Additional Comments
<ul style="list-style-type: none">- Mostly mud (sparse epifauna/urchins), Psolus encrusted cobbles/boulders, and carbonate terraces, some Lophelia colonies and escarpment community on overhangs, encrusting globose sponge patches

DIVE SUMMARY			
DIVE #	490	TRANSECT #	40

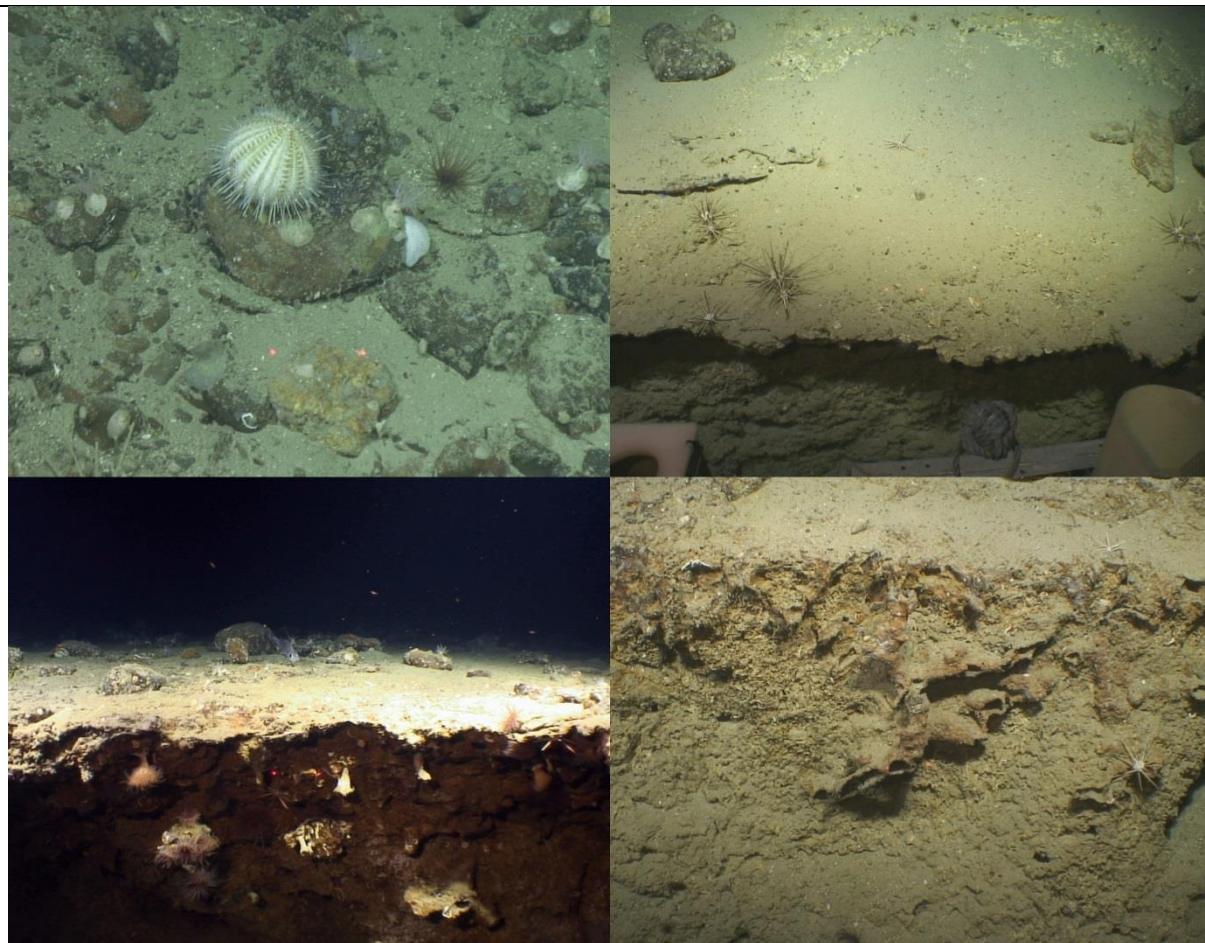
	Start	End
Date & Time	18/07/2017 18:46:48	18/07/2017 21:24:03
Latitude/ Longitude	54.42672533, -11.332851	54.41913717, -11.33948283
Depth	728.03	627.48
Images	IMG_7870-IMG_8037.JPG (currently missing)	
Samples	1 x pushcore	

Location	East of C7
Target Features	Escarpment
Depth Range	545.45-728.09m (av 639.654m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The main assemblage encountered throughout the dive was a sparse encrusting community on cobbles and boulders dominated by the holothurian *Psolus squamatus*.
(M.AtMB.Ro.SpaEnc.PsoAno)

Top R. The escarpment feature presented as sharp edged terraces of sedimentary rock. A heavy sand veneer hosted *Cidaris cidaris* urchins while cobbles and boulders continued to host the sparse encrusting community. (M.AtMB.Sa.UrcCom.CidUrc)

Bottom L. A long part of the dive was spent traversing along this escarpment edge, seeing the predominantly sparse encrusting community dominated by *Serpulid* worms, but occasionally displaying overhang escarpment community species such as *Desmophyllum cf dianthus*. Above the escarpment edge *Cidaris cidaris* dominated the sand veneered flat sedimentary rock, while *P. squamatus* occupied the cobbles and boulders. (M.AtUB.Ro.SpaEnc, M.AtMB.Sa.UrcCom.CidUrc)

Bottom R. The escarpment edge (as seen in Bottom L) often featured tube features such as the one seen here. These have been interpreted as fossil burrows, but should be examined by a geologist for official interpretation.

Summary Description (habitat transitions noted)

HD VIDEO A 0m/18:46pm [1]. The dive starts on coarse mixed sediment of sand/gravel/pebbles with urchins, mainly *Cidaris cidaris*. **5m [2]** cobbles and boulders on sand mark the bottom of the main escarpment feature, colonised by a sparse encrusting community dominated by the sedentary holothurian *Psolus squamatus*. *C. cidaris* is also abundant. The escarpment presents as sloping and sometimes vertical sedimentary rock with a heavy sand veneer, while ledges support relatively dense cobble/boulder fields. **23m [3]** Steep vertical sedimentary rock and steeply inclined ledges with heavy sand veneer promote an extended area dominated by *C. cidaris*. **26m [4]** a return to the alternating ledges of cobbles/boulders and areas of sand veneered sedimentary rock and the *P. squamatus/C. cidaris* mosaic. **28m [5]** a more gentle upslope promotes deeper sand. Here sparse/patchy cobbles are encountered and the sand displays a sparse epifaunal community with *Actiniidae sp* (OTU41) being the most obvious reoccurring species (this may be *Bolocera tuediae* but the column is never visible and it seems to be burrowed in the sediment). 44m ROV laterals to the right. 46m ROV heads straight forwards again. **55m [6]** *C. cidaris* is again abundant with cobbles still hosting *P. squamatus*. (**Note** there is one boulder which displays a barnacle dominated community). This continues until the edge of a drop-off. 1h03m-1h5m seafloor not visible due to descent over cliff. 1h5m The seafloor again visible showing more terraced sedimentary rock with sand veneer and ledges with cobbles and boulders as before (continued *C. cidaris/P.squamatus*) 1h10m ROV traverses right. 1h26m-1h27m ROV ascends a little before traversing again. (**Note** 1h32m Another solitary boulder dominated by barnacles while others are *P.squamatus* dominated.) **1h34m [7]** ascend and traverse vertical sedimentary rock cliff with sparse encrusting community dominated by Serpulids. *C cidaris* is also present. Reach lip of cliff and begin long traverse along this cliff edge. Boulders and cobbles (with *P.squamatus*) can be seen on the ledge above, while serpulids continue to dominate the vertical sedimentary rock. Occasional sparse occurrence of the overhang/escarpment assemblage (*Desmophyllum cf dianthus* and *Actiniaria sp* 13 (OTU478)) seen on other dives on this escarpment. *C. cidaris* can be seen both occasionally on the vertical sedimentary rock, and on the sediment veneered sedimentary rock shelf. **HD VIDEO A ENDS**

1h53m/20:40pm. HD VIDEO B STARTS 0m/20:41pm. 16m 30s of obscured vision due to sediment disturbance. 26m one of the brief areas with an overhang community. **34m [8]** Stop traversing the cliff edge and ascend over the cobble/boulder field (*P. squamatus/C.cidaris*). **35m [9]** The cobbles with *P. squamatus* become patchy, again proceeding over deeper sediment veneer with sparse *Actiniidae sp* being the most apparent epifauna. 39m Stop to take a pushcore, then **HD VIDEO B ENDS at 42m/21:24pm.**

Physical Data			
Reef (types can be concurrent)	67% reef	67% geogenic	
		n/a	n/a
Substrates	<ul style="list-style-type: none"> - Boulders - Sedimentary rock - Cobbles - Gravel - Pebbles - Sand/mud 		
Geomorphology/Features	Canyon Escarpmment <ul style="list-style-type: none"> - cobble/boulder field - cliff - cliff edge - fossil burrows? - terraced sedimentary rock 		
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder fields - sloping rock (sedimentary rock) - vertical rock 		
Pressures	<ul style="list-style-type: none"> - 6 x fishing net - 1 x fishing line - 1 x plastic 		

Biological Data				
Number of Species		53 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
478	Actiniaria sp 13 (pink/purple)	M	R	
605	Actiniaria sp 20	M	R	
907	Actiniaria sp 24	M	R	
41	Actiniidae sp (sandBolocera)	M	R	
278	Anthomastus grandiflorus	M	R	
311	Anthothelia grandiflora	Mass	R	
188	Araeosoma fenestratum	L	R	
591	Ascidiae sp (clear)	M	R	
34	Brachiopoda	S	R	
258	Brosme brosme	L	R	
6	Caryophyllia sp	M	R	
388	Ceremaster/Peltaster/Plinthaster sp 2	M	R	
2	Ceriantharia	M	O	
254	Chaceon affinis	L	O	
265	Chimaera monstrosa	L	R	
211	Cidaris cidaris	M	O	
303	Coelorrhynchus coelorrhynchus	L	R	
113	Colus sp	M	R	
39	Corallimorphidae sp 1	M	R	
43	Corallimorphidae sp 2	M	R	
120	Corymorphidae sp	M	R	
566	Coryphaenoides rupestris	L	R	
335	Desmophyllum cf dianthus	M	R	
445	Echinus sp 1	M	R	
23	Halcampoididae sp 1	S	R	
227	Helicolenus dactylopterus	L	R	
56	Hydrozoa flat/branched	L	O	
249	Lepidion eques	L	O	
250	Lophelia pertusa	L	O	
273	Lophius piscatorius	L	O	
251	Madrepora oculata	L	O	
11	Majidae sp 1	S	R	
277	Margarites sp 1	S	R	
1019	Merlangius merlangus	L	R	
654	Molva molva	L	R	
200	Munida sarsi	M	R	
1026	Mysida (indet)	S	R	
1003	Nezumia aequalis	M	R	
1076	Ophiuroida (indet)	S	R	
458	Pachycerianthus multiplacatus	M	R	
205	Paguridae spp	M	R	
304	Paramola cuvieri	L	O	
207	Pliobrothus sp	M	R	
800	Porifera encrusting (blue)	Crust	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
252	Psolus squamatus	M	R	
204	Rete porella sp 1	M	R	
54	Sabellidae sp 1	M	R	
106	Serpulidae sp 1	M	F	
198	Stichastrella rosea	M	R	
440	Synaphobranchus kaupii	L	O	
446	Trachychynxus sp	L	R	
586	Zoanthidea sp 2	Mass	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtMB.Ro.SpaEnc.PsoAno	Psolus squamatus, Anomiidae, serpulid polychaetes and Munida on Atlantic mid bathyal rock and other hard substrata	
M.AtMB.Sa	Atlantic mid bathyal sand	
M.AtMB.Sa.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic mid bathyal sand	

M.AtUB.Ro.SpaEnc	Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtMB.Sa.UrcCom.CidUrc 211 <i>Cidaris cidaris</i>	
2	M.AtMB.Ro.SpaEnc.PsoAno, M.AtMB.Sa.UrcCom.CidUrc 252 <i>Psolus squamatus</i> , 211 <i>Cidaris cidaris</i>	
3	M.AtMB.Sa.UrcCom.CidUrc 211 <i>Cidaris cidaris</i>	
4	M.AtMB.Ro.SpaEnc.PsoAno, M.AtMB.Sa.UrcCom.CidUrc 252 <i>Psolus squamatus</i> , 211 <i>Cidaris cidaris</i>	
5	M.AtMB.Sa, M.AtMB.Ro.SpaEnc.PsoAno (sparse)41 <i>Actiniidae</i> sp, 252 <i>Psolus squamatus</i>	
6	M.AtMB.Sa.UrcCom.CidUrc, M.AtMB.Ro.SpaEnc.PsoAno 211 <i>Cidaris cidaris</i> , 252 <i>Psolus squamatus</i>	
7	M.AtUB.Ro.SpaEnc, M.AtMB.Sa.UrcCom.CidUrc 106 <i>Serpulidae</i> sp	
8	M.AtMB.Ro.SpaEnc.PsoAno, M.AtMB.Sa.UrcCom.CidUrc 252 <i>Psolus squamatus</i> , 211 <i>Cidaris cidaris</i>	
9	M.AtMB.Sa, M.AtMB.Ro.SpaEnc.PsoAno (sparse)41 <i>Actiniidae</i> sp, 252 <i>Psolus squamatus</i>	

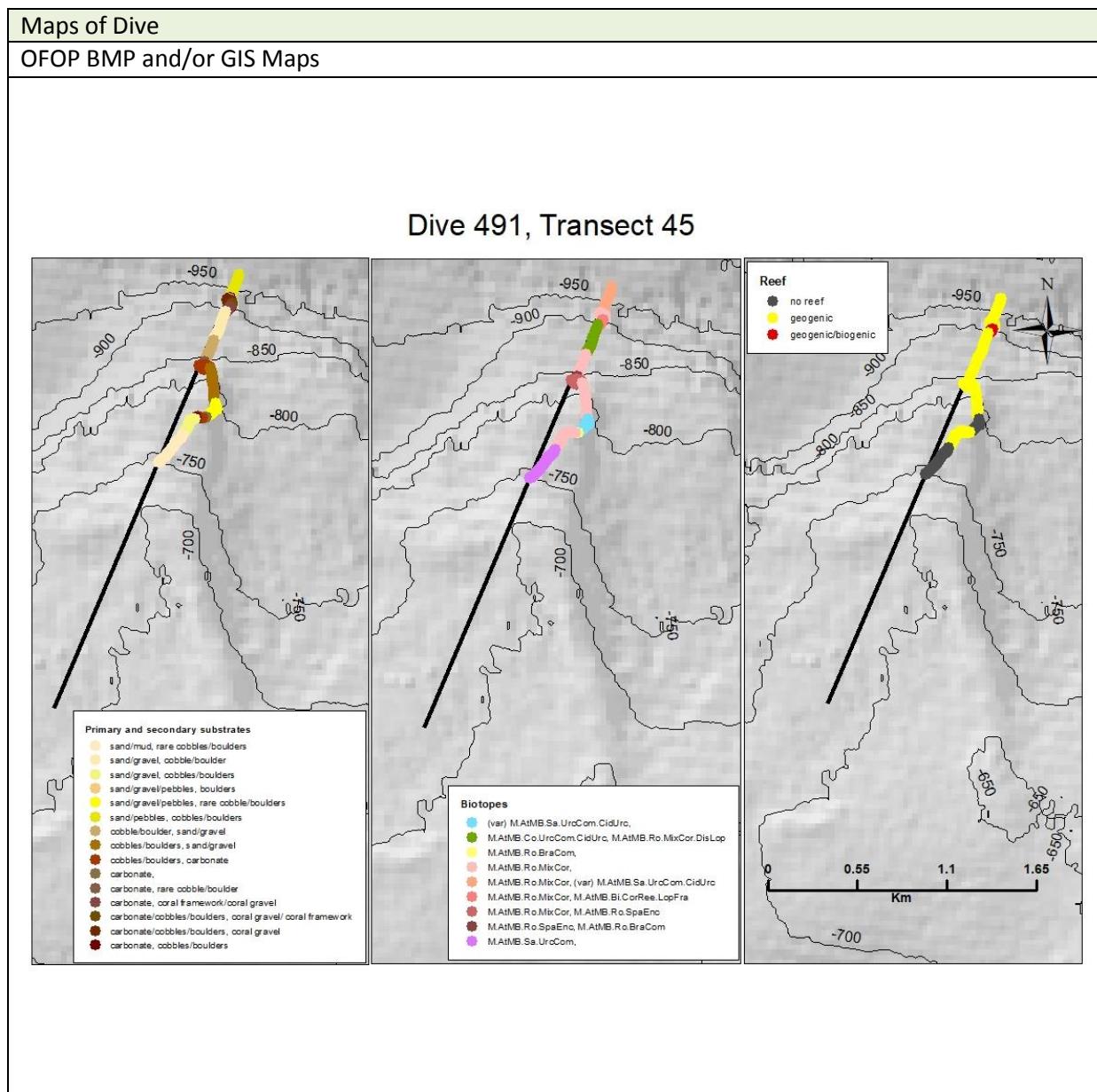
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
n/a	n/a	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - The escarpment edge is interpreted as a two assemblage mosaic (sparse encrusting and <i>Cidaris cidaris</i>). For management purposes the recorded communities are sufficiently representative of the dominant communities displayed but some areas do show a sparse escarpment/overhang community with <i>Desmophyllum cf dianthus</i> and pink/purple <i>Actiniaria</i> sp (OTU478) and the cobbles boulders display a child of the sparse encrusting biotope – the <i>Psolus squamatus</i> community. - The interpreted “fossil burrows” may be worth showing to a geologist for more expert opinion. 		

DIVE SUMMARY	
DIVE #	TRANSECT #
491	45

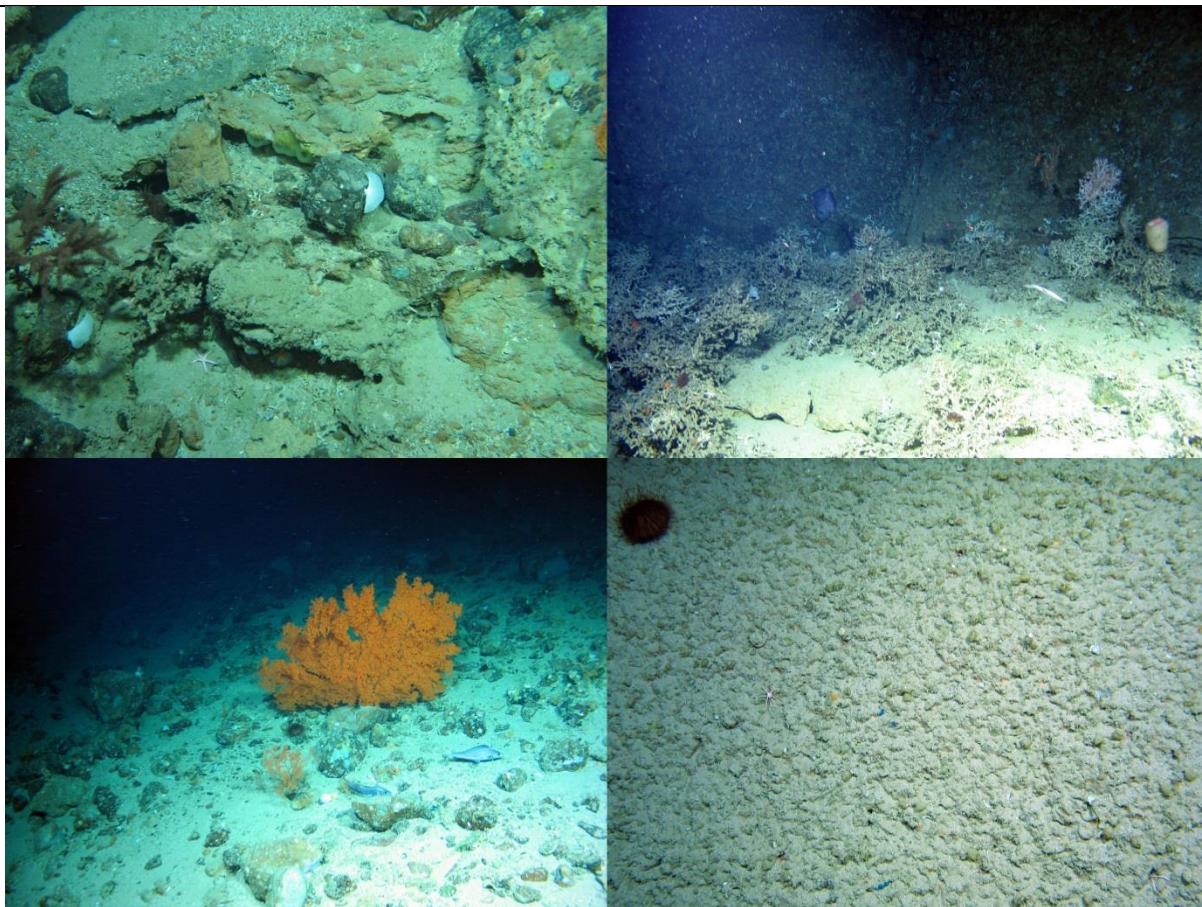
	Start	End
Date & Time	19/07/2017 00:38:24	19/07/2017 04:11:31
Latitude/ Longitude	54.2650395, -11.576984	54.2555208, -11.5849407
Depth	934.91	727.35
Images	IMG_8038-IMG_8149.JPG	
Samples	3 x Cidaris, 4 x Lophelia, 1 x Drifa, 1 x Madrepora, 2 x pushcores	

Location	C7
Target Features	Carbonate mound
Depth Range	727.13-934.91m (av. 814.524m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The dominant community throughout the dive was a mixed coral community (e.g. the branching cf *Chrysopathes* sp antipatharian on the left of this image) with abundant *Reteporella* sp bryozoans (centre image) and sparse encrusting fauna. (M.AtMB.Ro.MixCor)

Top R. Early in the transect a terraced cliff of carbonate (hosting mixed corals and a sparse encrusting community on the vertical faces) had several ledges full of *Lophelia pertusa* framework with a few living colonies present. These are likely formed from discrete colonies attached to the vertical rock above that have fallen and populated the ledges. (M.AtMB.Ro.MixCor, M.AtMB.Bi.CorRee.LopFra)

Bottom L. The majority of the dive was spent over cobble/boulder fields with mixed corals especially *Leiopathes* sp. *Reteporella* sp bryozoans were also abundant in these areas. (M.AtMB.Ro.MixCor)

Bottom R. Several areas of sloping/vertical carbonate were densely colonised by brachiopods. *Araeosoma fenestratum* urchins were always co-occurring. (M.AtMB.Ro.BraCom)

Summary Description (habitat transitions noted)

START OF HD VIDEO A 0m [1] Sand with pebbles and patchy cobbles and boulders. *Cidaris cidaris* was sparsely distributed on the mixed sediment while mixed corals, especially *Stichopathes* sp (OTU560). *Psolus squamatus* and an encrusting community are also present. 10m underlying sloping carbonate is briefly apparent. **11m [2]** sloping carbonate/bedrock features and ledges with cobbles and boulders and areas of coral gravel. Mixed corals continue here although encrusting globose sponges dominate (OTU75) along with *Reteporella* sp bryozoans. 12m ROV moving right (high) following ledge feature. 13m ROV moves in closer and moves back left. 17-20m stopped for imagery. 23m vertical carbonate rock with holes 25m ROV moves forward upslope. 27m coral framework present around the base of bedrock features where some solitary *Lophelia pertusa* and *Madrepora oculata* are present. **31m [3]** sloping/vertical carbonate with encrusting fauna and mixed corals, while intermediate ledges and slopes are full of dead coral framework with rare living colonies. These areas are likely formed from fallen living colonies from vertical rock above. 35-37m stop for imagery. 37m upper cliff hosts several discrete *Lophelia pertusa* colonies and is heavily colonised by pale zoanthids. 40m top of cliff with horizontal bedrock shelf and scattered cobbles/boulder behind, stop for imagery. 41m Move right along ledge. **43m [4]** Proceed forward over horizontal bedrock with increasing sand veneer, and cobbles/boulders hosting *Cidaris cidaris* and discrete colonial Scleractinian colonies (many are *Madrepora oculata*). 53- 1h11m, several stops to sample *C. cidaris*. 1h14m-1h15m stop for imagery. **1h16m [5]** dense cobble/boulder field well colonised by encrusting fauna, *Reteporella* and mixed corals including *Leiopathes* sp and *Antipathes dichotoma*. **1h24m [6]** sloping carbonate with encrusting fauna and *Reteporella* sp with several dense patches of brachiopods. Ascend to edge of carbonate ledge with cobbles and boulders in depression below. Briefly follow curved edge of carbonate left. 1h27-1h42m sampling two *Lophelia pertusa* colonies. 1h45m-1h51m stop for imagery and *L. pertusa* sampling. **1h51m [7]** Descend over edge of carbonate crust feature and descend diagonally right down slope of alternating cobbles /boulders with mixed corals and sparsely encrusted sloping carbonate 1h56m stop descent and start moving left along slope. **1h59m [8]** cobbles boulders and sand with mixd corals, start moving upslope until stopping at **END OF HD VIDEO A 2h00m/02:38am. START OF HD VIDEO B 0m/02:39:50.** 2-3m stopped. 5-23m stopped for sampling *L. pertusa*, 27-35m stopped to image and sample *Drifa* sp. **39m [9]** transition to area of sand/gravel with pebbles and rare cobbles/boulders dominated by *Cidaris cidaris*. 43m move diagonally right uphill. 47m brief encounter with some boulders before reaching **48m [10]** base of vertical/sloping carbonate densely colonised by brachiopods with abundant *Araeosoma fenestratum* also present. **50m [11]** cobble/boulder field again colonised by mixed corals (e.g. *Leiopathes* sp is abundant) and encrusting fauna with erect *Reteporella* sp bryozoans. 52m stop and move left along a carbonate crust shelf before 55m proceeding forwards uphill, cobbles and boulders now sparser with sand/gravel overlying the carbonate crust. 57m moving diagonally left upslope. 59-1h05m sampling *Madrepora oculata* before continuing left. 1h08m ROV faces upslope and proceeds forward. **1h11m [12]** the substrate tends more towards sand/mud and cobbles/boulders sparse. Urchins (*C. cidaris*, *A. fenestratum*) dominate. 1h23m-1h30m stop to take two pushcores. Continue until **END OF HD VIDEO B 1h31m/04:11:31**.

Physical Data					
Reef (types can be concurrent)	87% reef	81% geogenic			
		5% biogenic	~1% living ~99% dead		
Substrates		<ul style="list-style-type: none"> - carbonate - cobble/boulder - pebbles - sand/gravel - sand/mud 			
Geomorphology/Features	<p>Carbonate mound</p> <ul style="list-style-type: none"> - carbonate crust edge - holes in vertical carbonate 				
Annex 1 Types	<ul style="list-style-type: none"> - dead coral structures - cobble/boulder field - sloping carbonate - vertical carbonate 				
Pressures	<ul style="list-style-type: none"> - 1 x plastic - 1 x fishing net (small/fine) 				

Biological Data				
Number of Species		85 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	O	
605	Actinaria sp 20	M	O	
41	Actiniidae sp (sandBolocera)	L	R	
930	Actinopterygia sp 3	M	R	
278	Anthomastus grandiflorus	M	O	
1187	Antipathella dichotoma	M	O	
264	Aphrocallistes sp	L	R	
188	Araeosoma fenestratum	L	F	
8	Ascidiaeacea (yellow)	M	R	
20	Ascidiaeacea sp 2	L	R	
284	Bathyphates sp (brown)	L	R	
328	Bathyphates sp 1	L	O	
12	Bolocera tuediae	L	R	
267	Bonellia viridis	M	R	
34	Brachiopoda	S	R	
258	Brosme brosme	L	R	
1077	Caridea (indet)	M	R	
6	Caryophyllia sp	M	R	
1048	Centrophorus squamosus	L	R	
388	Ceremaster/Peltaster/Plinthaster sp 2	M	O	
254	Chaceon affinis	L	R	
1054	Chirostylidae (indet)	M	R	
540	Chrysopathes sp/Trissopathes sp	L	O	
211	Cidaris cidaris	M	O	
82	Cirripedia sp	Mass	R	
303	Coelorhynchus coelorrhynchus	L	O	
39	Corallimorphidae sp 1 (dark)	M	O	
566	Coryphaenoides rupestris	L	R	
131	Crinoidea sp 1	M	R	
1139	Deania sp	L	R	
140	Drifa cf glomerata (pink)	L	O	
140	Drifa cf glomerata (white)	L	O	
649	Eknomisis sp	L	R	
1018	Epigonus telescopus	L	R	
1022	Gersemia sp 3	L	R	
1002	Goniasteridae sp	M	R	
307	Gorgonacea sp 7 (pink) cf Isidella	L	O	
1166	Guttigadus latifrons	M	R	
227	Helicolenus dactylopterus	L	R	
208	Henricia sanguinolenta	M	R	
432	Holothuroidea (cf Laetmogone) (blue)	L	R	
432	Holothuroidea (cf Laetmogone) (purple)	L	O	
50	Hydrozoa (bushy)	M	R	
56	Hydrozoa flat/branched	L	R	
983	Hymenaster membranaceus	L	R	
274	Hymenodiscus coronata/ Brisinga endacastrensis	L	R	
305	Leiopathes sp	L	F	
249	Lepidion eques	L	O	
557	Lepidisis sp	L	R	
250	Lophelia pertusa	L	O	
273	Lophius piscatorius	L	R	
251	Madrepora oculata	L	O	
277	Margarites sp 1	S	R	
1019	Merlangius merlangus	L	R	
349	Mora moro	L	O	
200	Munida sarsi	M	R	
339	Munida tenuimana	M	R	
563	Neocyttus helgae	L	O	
205	Paguridae spp	M	R	
1065	Paragorgia sp (pale)	L	R	
304	Paramola cuvieri	L	O	
1050	Paramuricea sp	L	R	
1042	Parantipathes sp (unbranched)	L	O	
266	Parastichopus tremulus	L	R	
1081	Phanipathes sp	L	R	
255	Phelliactis sp 1	L	R	
1020	Phycis blennoides	L	O	
207	Pliobrotus sp	M	R	
263	Porania pulvillus	L	R	
1164	Porifera cylindrical sp (rough)	L	R	
800	Porifera encrusting (blue)	Crust	R	
75	Porifera encrusting globose (pale)	Mass	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
30	Porifera encrusting sp 10 (yellow)	Crust	R	
1132	Porifera lamellate lobose (fleshy)	M	R	
433	Pseudarchaster sp 1	M	R	
252	Psolus squamatus	M	O	
204	Reteponella sp 1	M	C	
106	Serpulidae sp 1	M	F	
198	Stichastrella rosea	M	R	
283	Stichopathes cf gravieri	L	F	
440	Synaphobranchus kaupii	L	R	
1181	Telopathes sp 2 (red)	L	R	
1149	Zoanthidea sp (sweetcorn)	Mass	R	
586	Zoanthidea sp 2	Mass	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtMB.Sa.UrcCom.CidUrc	(mixed sediment variant) Cidarid urchin assemblage on Atlantic mid bathyal sand	
M.AtMB.Co.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic mid bathyal coarse sediment	
M.AtMB.Ro.BraCom	Brachiopod dominated community on Atlantic mid bathyal rock and other hard substrata	
M.AtMB.Ro.MixCor	Mixed cold water coral community on Atlantic mid bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtMB.Ro.SpaEnc	Sparse encrusting community on Atlantic mid bathyal rock and other hard substrata	
M.AtMB.Sa.UrcCom	Urchin dominated community on Atlantic mid bathyal sand	
M.AtMB.Bi.CorRee.LopFra	Mixed coral assemblage on Atlantic mid bathyal Lophelia pertusa reef framework (biogenic structure)	Lophelia pertusa reefs (OSPAR); Cold-water coral reef (ICES), Lophelia pertusa/Madrepora oculata reef (ICES subcategory)
M.AtMB.Ro.MixCor.DisLop	Discrete Lophelia pertusa colonies on Atlantic mid bathyal rock and other hard substrata	(not enough)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtMB.Ro.MixCor, (var) M.AtMB.Sa.UrcCom.CidUrc 283 Stichopathes cf gravieri, 211 Cidaris cidaris	
2	M.AtMB.Ro.MixCor 75 Porifera encrusting globose, 204 Reteporella sp 1	
3	M.AtMB.Ro.MixCor, M.AtMB.Bi.CorRee.LopFra 586 Zoanthidea sp 2, 605 Actiniaria sp 20, 106 Serpulidae, 250 Lophelia pertusa	
4	M.AtMB.Co.UrcCom.CidUrc, M.AtMB.Ro.MixCor.DisLopT 211 Cidaris cidaris, 251 Madrepora oculata	
5	M.AtMB.Ro.MixCor 204 Reteporella sp	
6	M.AtMB.Ro.SpaEnc, M.AtMB.Ro.BraCom 204 Reteporella sp, 34 Brachiopoda, 188 Araeosoma fenestratum	

7	M.AtMB.Ro.MixCor, M.AtMB.Ro.SpaEnc 305 Leiopathes sp, 204 Reteporella sp, 34 Brachiopoda
8	M.AtMB.Ro.MixCor 305 Leiopathes sp, 204 Reteporella sp
9	(var) M.AtMB.Sa.UrcCom.CidUrc 211 Cidaris cidaris
10	M.AtMB.Ro.BraCom 34 Brachiopoda, 188 Araeosoma fenestratum
11	M.AtMB.Ro.MixCor 204 Reteporella sp, 305 Leiopathes sp, 188 Araeosoma fenestratum
12	M.AtMB.Sa.UrcCom 211 Cidaris cidaris, 188 Araeosoma fenestratum

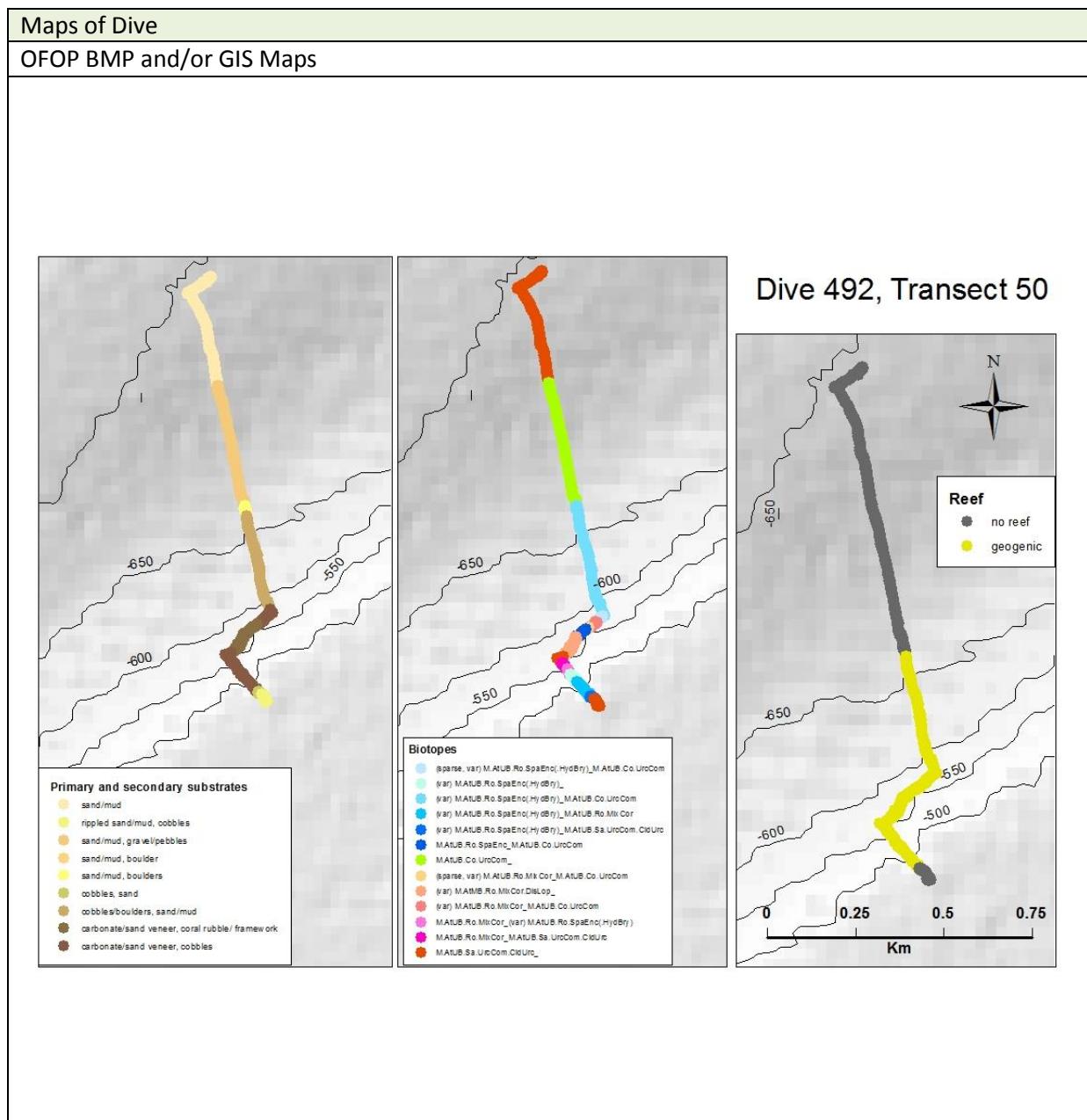
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens	ICES/OSPAR ICES subcategory	
- Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens		
Listed Species Encountered (Fish, Count)		
<i>Centrophorus squamosus</i>	2	OSPAR/IUCN

Additional Comments		
- Carbonate and cobble/boulder reefs, mixed corals present including many large Leiopathes, Reteporella bryozoans also abundant. Some dense patches of brachiopods on sloping carbonate.		

DIVE SUMMARY	
DIVE #	TRANSECT #
492	50

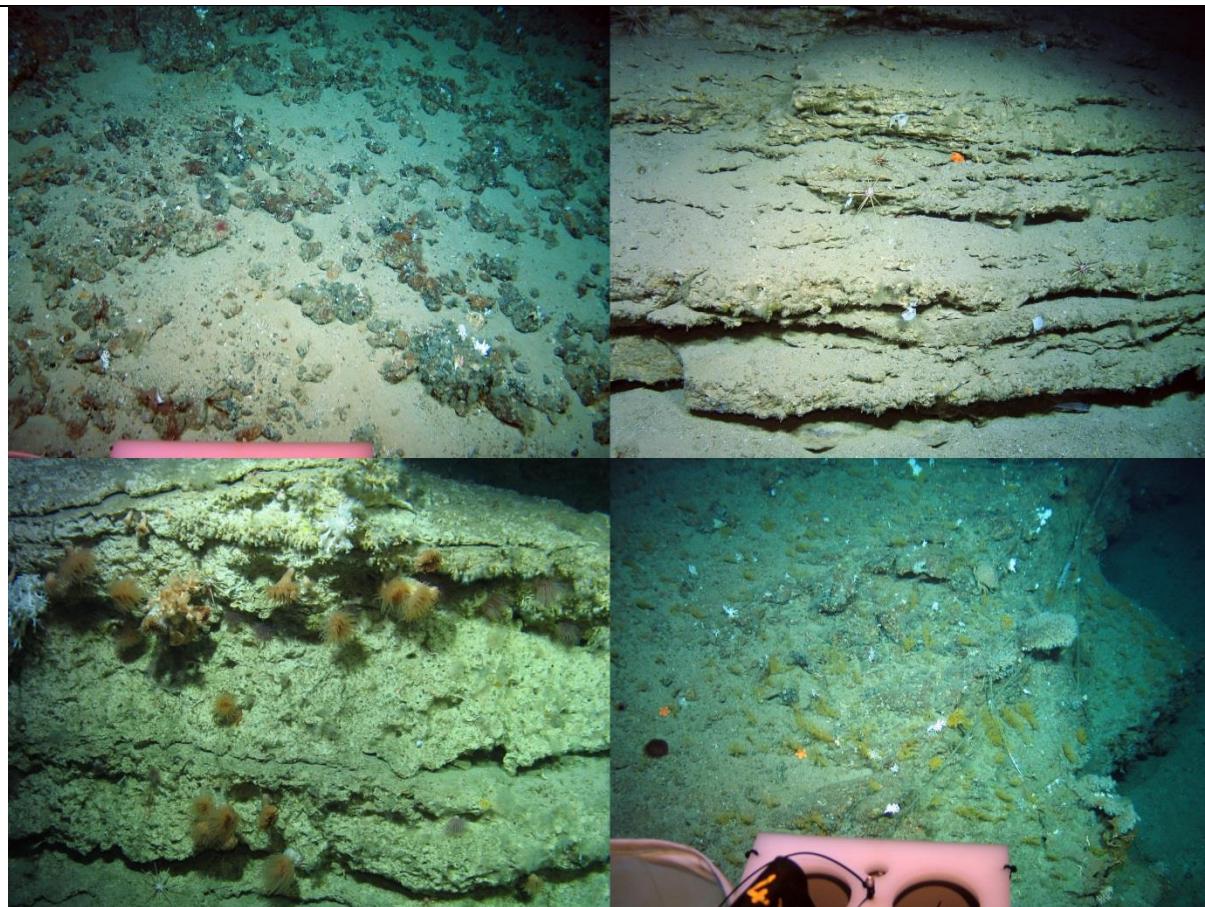
	Start	End
Date & Time	19/07/2017 08:58:08	19/07/2017 11:40:42
Latitude/ Longitude	54.0280875, -12.225441	54.01507317, -12.22348633
Depth	632.48	470.75
Images	IMG_8153-IMG_8337.JPG	
Samples	1 x Lophelia pertusa, 1 x Pushcore	

Location	South of C9
Target Features	Escarpment
Depth Range	462.89-656.98m (av. 551.517m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The cobble boulder fields here are dominated by hydrocorals (*Pliobothrus sp*) and lace coral bryozoans (*Reteporella sp*). This community has been labelled as an extension of a sparse encrusting community. ((var) M.AtUB.Ro.SpaEnc(.HydBry))

Top R. The carbonate ledges with heavy sand/mud veneer and *Cidaris cidaris* urchins. (M.AtUB.Sa.UrcCom.CidUrc)

Bottom L. Vertical carbonate here displayed the escarpment/overhang community seen in several other dives especially hosting *Desmophyllum cf dianthus*, pink/purple *Actiniaria sp 13* (OTU478) and discrete *Lophelia pertusa* colonies. This dive also displays abundant zoanthid anemones and bushy hydrozoans in these areas.((var) M.AtUB.Ro.MixCor, or with more *Lophelia* (var) M.AtMB.Ro.MixCor.DisLop)

Bottom R. The hydrozoan/bryozoan sparse encrusting community at times overlapped with a mixed coral community heavily dominated by a yellow anthozoan (probably octocorals, OTU1028), also seen on transect 42. (M.AtUB.Ro.MixCor, (var) M.AtUB.Ro.SpaEnc(.HydBry))

Summary Description (habitat transitions noted)

HD VIDEO A STARTS 0m/10:55am [1] The dive starts on sand/mud with *Cidaris cidaris* urchins. 7m the ROV laterals left, then turns ~90° and stops. 8m continue forwards. **24m [2]** increasing pebbles and gravel with mixed urchins (particularly *C.cidaris*, and *Araeosoma fenestratum*) and the burrowing bolocera-like Actiniidae sp (OTU41). **41m [3]** clumps of boulders followed by dense cobbles and boulders host a community most obviously dominated by *Pliobothrus sp* and *Reteporella sp* interspersed by urchins. 56m sloping sand veneered carbonate begins, cobbles and boulders persist. 57m a carbonate ledge feature is encountered and the ROV starts traversing along it to the right. 1h04m ROV starts moving forward up over sloping layered broken carbonate crust. **1h05m [4]** A small (~2m high) vertical carbonate cliff is met, colonised by an escarpment/overhang community, mainly *Desmophyllum cf dianthus* and some small colonies of *Lophelia pertusa*. 1h06m the ROV starts tracking along the course of a snagged fishing line until 1h09m the ROV leaves the rope and continues along the vertical carbonate face. **1h18m25s [5]** The carbonate is now only sparsely encrusted but coral rubble and broken framework (some fresh) can be seen at the base of cliff suggesting *Lophelia pertusa* colonies somewhere above. **1h26m [6]** Discrete *Lophelia pertusa* colonies start appearing then become dense, along with abundant *D. cf dianthus* 1h41m Encrusting globose porifera (OTU75) is also abundant. 1h42m-1h50m stop for sampling *L. pertusa* from vertical cliff with scoop then continue traversing along. **HD VIDEO A ENDS 1h56m/10:54am. HD VIDEO B ENDS 0m/10:55am.** Cliff and discrete *L. pertusa* escarpment community continues. **6m [7]** the cliff ends and more layered sloping carbonate crust with sand veneer continues with *C. cidaris*. **11m [8]** A small cave is encountered under the carbonate. Unknown yellow anthozoans (OTU1028, possibly juvenile *Paramuricea* sp., but unsure) are abundant here, yet patchy, together with *C. cidaris*. **19m [9]** The carbonate crust and broken protrusions start to be colonised by *Pliobothrus sp* and *Reteporella sp*. Patchy occurrence of the yellow anthozoans (OTU1028, possibly juvenile *Paramurica* sp, but unsure) continues allows this to be termed more of a mixed coral community mosaicked with the Hydrozoan/Bryozoan community seen earlier. The ROV tracks along another fishing line leading to more tangled line. *C. cidaris* is also abundant. **17m [10]** The Hydrozoan/Bryozoan community continues with sometimes abundant bushy hydrozoans (OTU50) now with broken carbonate boulders also being encountered. **18m [11]** Again the Hydrozoan/Bryozoan community is mosaicked with patchy yellow anthozoans. Several more fishing lines are encountered. **26m [12]** The sand deepens and cobbles of decreasing density host the Hydrozoan/Bryozoan community (which is increasingly sparse) with *C. cidaris*. **29m [13]** *C. cidaris* is now the only dominant fauna and the cobbles are sparse. The ROV stops to take a pushcore and attempt to rearrange the scoop/*Lophelia* sample before the **HD VIDEO B ENDS 45m/ 11:40am.**

Physical Data			
Reef (types can be concurrent)	63 % reef	65 % geogenic	
		n/a	n/a
		n/a	n/a
Substrates	<ul style="list-style-type: none"> - boulders - carbonate - cobbles - coral rubble/framework - gravel/pebbles - sand - sand/mud 		
Geomorphology/Features	<p>Escarpment</p> <ul style="list-style-type: none"> - broken carbonate - carbonate cave - carbonate ledge - cobble/boulder field - layered carbonate - vertical carbonate <p>Shelf</p>		
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder field - sloping rock - vertical rock 		
Pressures	10 x fishing line 1 x plastic 1 x fishing net		

Biological Data			
Number of Species		67 spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U.	Name	Size/Growth	SACFOR
4	Actinaria sp 1	M	R
478	Actinaria sp 13 (pink/purple)	M	R
976	Actinaria sp 27 (pink)	M	R
41	Actiniidae sp (sandBolocera)	M	R
930	Actinopterygii sp 3	M	R
278	Anthomastus grandiflorus	M	R
1131	Apristurus sp (indet)	L	R
188	Araeosoma fenestratum	L	F
235	Bathynectes sp	L	R
1025	Beryx decadactylus	L	O
267	Bonellia viridis	M	R
258	Brosme brosme	L	O
1077	Caridea (indet)	M	R
1048	Centrophorus squamosus	L	R
388	Ceremaster/Peltaster/Plinthast	M	R
2	Ceriantharia	M	R
289	cf Clavulariidae sp	Mass	R
265	Chimaera monstrosa	L	O
1054	Chiostyidae (indet)	M	R
540	Chrysopathes sp/Trissopathes	L	R
211	Cidaris cidaris	L	F
303	Coelorhynchus coelorrhynchus	L	O
1100	Conger conger	L	O
43	Corallimorphidae sp 2	M	R
543	Decapoda sp 3	L	O
335	Desmophyllum cf dianthus	M	R
445	Echinus sp 1	M	R
1018	Epigonus telescopus	L	O
227	Helicolenus dactylopterus	L	O
1024	Hydrolagus cf mirabilis	L	R
50	Hydrozoa (bushy)	M	O
56	Hydrozoa flat/branched	L	R
274	Hymenodiscus coronata/ Brisir	L	R
249	Lepidion eques	L	O
1067	Leucoraja sp	L	R
250	Lophelia pertusa	L	F
277	Margarites sp 1	S	R
1019	Merlangius merlangus	L	O
654	Molva molva	L	R
200	Munida sarsi	M	R
171	Mycale lingua	L	O
659	Octopodidae (indet)	L	R
458	Pachycerianthus multiplacatus	M	R
205	Paguridae spp	M	R
304	Paramola cuvieri	L	F
1050	Paramuricea sp	L	O
255	Phelliactis sp 1	L	O
1020	Phycis blennoides	L	O
207	Pliobrothus sp	M	F
263	Porania pulvillus	M	R
118	Porifera encrusting (black/red)	Crust	R
800	Porifera encrusting (blue)	Crust	R
9	Porifera encrusting (orange)	Crust	R
75	Porifera encrusting globose (pi)	Mass	O
1	Porifera encrusting sp 1 (white)	Crust	R
30	Porifera encrusting sp 10 (yellow)	Crust	R
252	Psolus squamatus	M	O
204	Reteponella sp 1	M	F
106	Serpulidae sp 1	M	R
1135	Siphonophora sp (indet)	L	O
537	Spatangus raschi	L	O
198	Stichastrella rosea	M	R
440	Synaphobranchus kaupii	L	O
1028	Unknown anthozoa (yellow)	M	F
199	Velatida sp 1	M	R
586	Zoanthidea sp 2	Mass	O
259	Zoarcidae sp 1	M	R

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtMB.Ro.MixCo r.DisLop	(canyon/escarpment variant) Discrete Lophelia pertusa colonies on Atlantic mid bathyal rock and other hard substrata	Coral gardens (OSPAR/ICES); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
(var) M.AtUB.Ro.MixCor	(canyon/escarpment variant) Mixed cold water coral community on Atlantic upper bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Non-reefal scleractinian aggregations (ICES subcategory)
(var) M.AtUB.Ro.SpaEnc .HydBry	(variant) Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata (dominated by Hydrozoans [e.g. Stylaster/Pliobothrus] and Bryozoans [e.g. Reteporella])	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Stylasterid corals on hard substrata (ICES subcategory)
M.AtUB.Co.UrcCom	Urchin dominated community on Atlantic upper bathyal coarse sediment	
M.AtUB.Ro.MixCor	Mixed cold water coral community on Atlantic upper bathyal rock and other hard substrata	Coral Garden (ICES/OSPAR), Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtUB.Ro.SpaEnc	Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata	
M.AtUB.Sa.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic upper bathyal sand	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtUB.Sa.UrcCom.CidUrc 211 Cidaris cidaris	
2	M.AtUB.Co.UrcCom 41 Actiniidae sp, 211 Cidaris cidaris, 188 Araeosoma fenestratum	
3	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 204 Reteporella sp, 207 Pliobothrus, 211 Cidaris cidaris	
4	(var) M.AtUB.Ro.MixCor, M.AtUB.Co.UrcCom 335 Desmophyllum cf dianthus, 106 Serpulidae sp, 211 Cidaris cidaris	
5	M.AtUB.Ro.SpaEnc, M.AtUB.Co.UrcCom 106 Serpulidae, 211 Cidaris cidaris	

6	(var) M.AtMB.Ro.MixCor.DisLop 250 Lophelia pertusa, 335 Desmophyllum cf dianthus, 586 Zoanthidea sp 2, 75 Porifera encrusting globose
7	M.AtUB.Sa.UrcCom.CidUrc 211 Cidaris cidaris
8	M.AtUB.Ro.MixCor, M.AtUB.Sa.UrcCom.CidUrc 1028 Unknown anthozoa (yellow), 211 Cidaris cidaris
9	M.AtUB.Ro.MixCor, (var) M.AtUB.Ro.SpaEnc(.HydBry) 1028 Unknown anthozoa (yellow), 211 Cidaris cidaris, 207 Pliothrus sp
10	(var) M.AtUB.Ro.SpaEnc(.HydBry) 207 Pliothrus sp, 211 Cidaris cidaris, 50 Hydrozoa bushy
11	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Ro.MixCor 207 Pliothrus sp, 1028 Unknown anthozoa (yellow), 211 Cidaris cidaris
12	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Sa.UrcCom.CidUrc 207 Pliothrus sp, 211 cidaris cidaris
13	M.AtUB.Sa.UrcCom.CidUrc 211 Cidaris cidaris

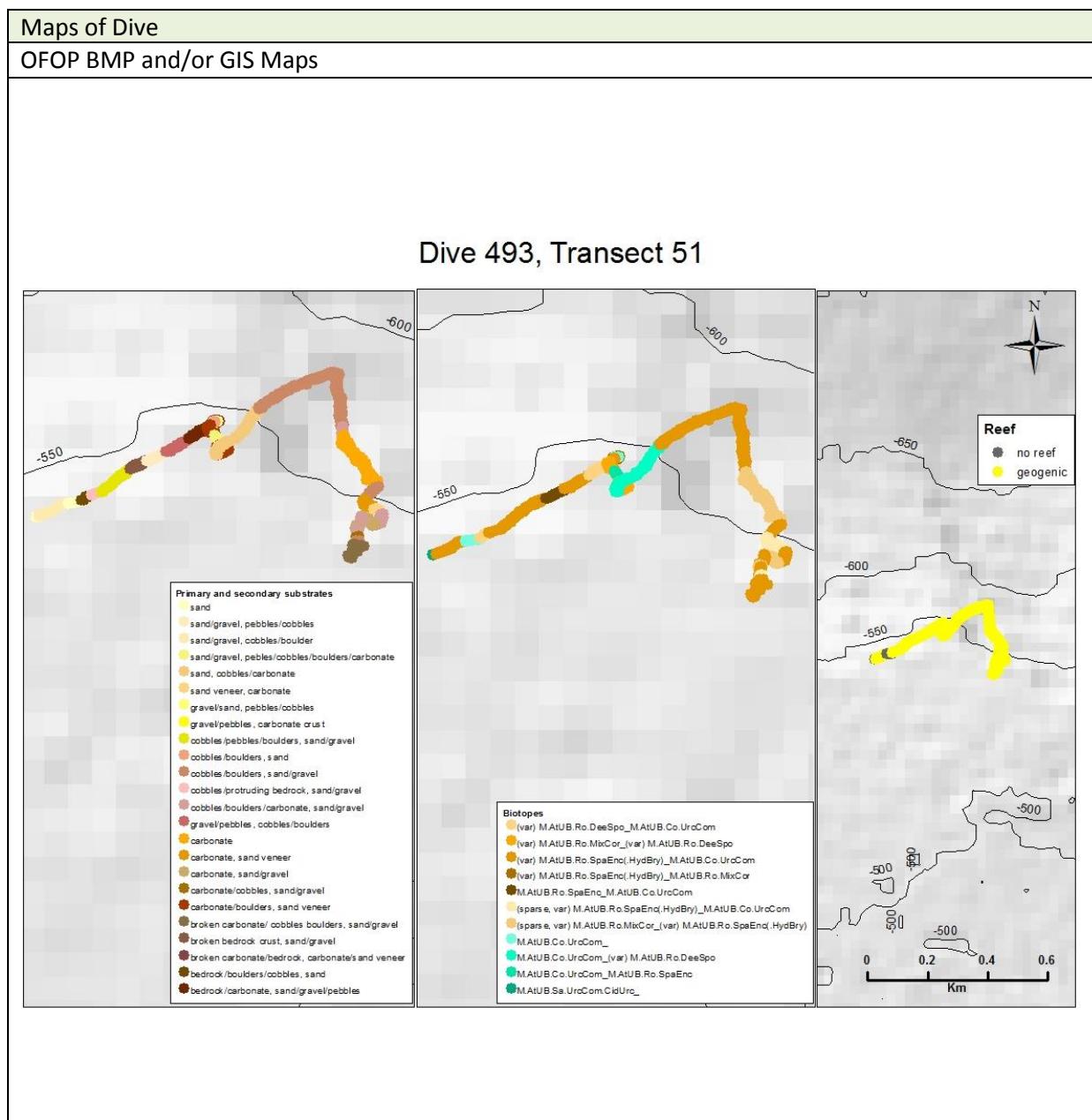
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens	ICES/OSPAR	
- Hard-bottom coral garden <ul style="list-style-type: none"> ○ Colonial scleractinians on rocky outcrops ○ Hard-bottom gorgonian and black coral gardens ○ Non-reefal scleractinian aggregations ○ Stylasterid corals on hard substrata 	ICES subcategory ICES subcategory ICES subcategory ICES subcategory	
Listed Species Encountered (Fish, Count)		
<i>Centrophorus squamosus</i>	1	IUCN/OSPAR

Additional Comments		
<ul style="list-style-type: none"> - Hydrozoan/bryozoan community on cobbles/boulders/bedrock, some escarpment Desmophyllum/Lophelia community on overhangs, area of dense unknown yellow anthozoans (octocorals?), encrusting globose sponge patch - This dive has some particular similarities to dive 42 (i.e. Hydrozoan/Bryozoan community, escarpment/overhang communities, the abundant unknown yellow anthozoan (OTU1028) and encrusting globose sponge (OTU75). - Also compare with the other escarpment dives: 51, 4, 40, 19. 		

//DIVE SUMMARY	
DIVE #	TRANSECT #
493	51

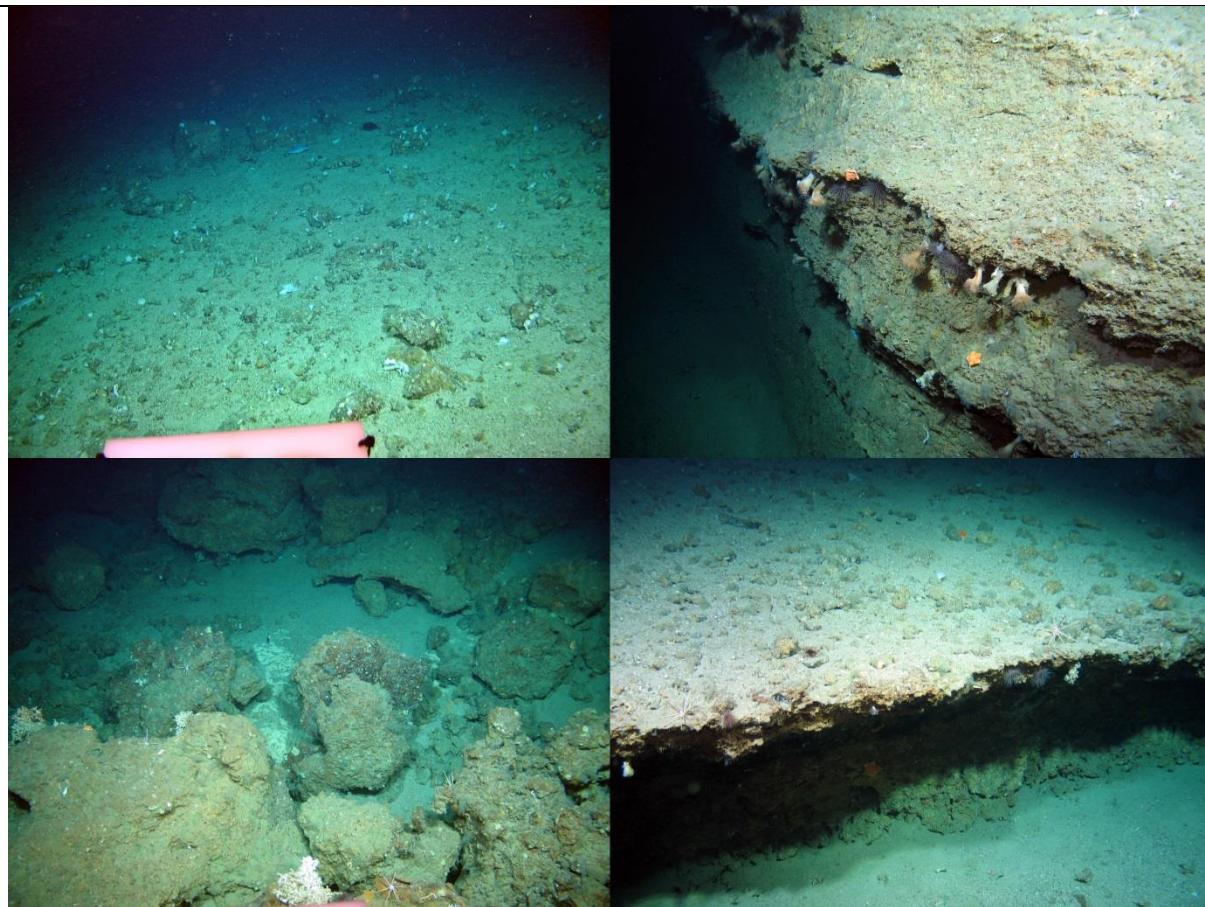
	Start	End
Date & Time	19/07/2017 19:25:04	19/07/2017 21:29:17
Latitude/ Longitude	54.066917, -11.98381533	54.06629317, -11.9778465
Depth	510.97	503.45
Images	IMG_8338-IMG_8486	
Samples	n/a	

Location	S of C8
Target Features	Escarpment
Depth Range	501.85-569.92m (av 531.8m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. This assemblage, which was encountered frequently, does not fit with the existing biotope classifications. It is closest to a sparse encrusting biotope with additional Styelasterid hydrocorals and Reteporella bryozoans. Similar was seen on transect 42. ((variant) M.AtUB.Ro.SpaEnc(.HydBry))

Top R. The large escarpment feature was sparsely encrusted with occasional overhanging ridges hosting *Desmophyllum cf dianthus* and purple anemones. ((escarpment variant) M.AtUB.Ro.MixCor)

Bottom L. An example of broken rock boulders, these were clearly previously part of the crust but have broken away.

Bottom R. One of the smaller step-like escarpment features, again hosting *Desmophyllum cf dianthus* and purple anemones typical of the escarpment assemblages seen so far, while the cobbles and *Reteporella* continue on the slope above. ((variant) M.AtUB.Ro.SpaEnc(.HydBry), (escarpment variant) M.AtUB.Ro.MixCor)

Summary Description (habitat transitions noted)

START OF HD VIDEO 0m/19:25pm [1]: The transect starts briefly on sand with *Cidaris cidaris* **0m24s** **[2]:** the ROV quickly reaches an area of cobbles and boulders and an assemblage of predominantly encrusting fauna with dominant stylasterid hydrocorals. The landscape gently slopes to the left. **4m** **[3]:** sand with urchins (*C.cidaris* and *Araeosoma fenestratum*) **5m** **[4]:** an area of broken bedrock, still sloping off to the left, this initial section is dominated by an encrusting globose sponge (OTU75) **6m** **[5]:** changes to a cobble/boulder field with gravelly sand, stylasterids again dominating along with *C.cidaris*. Occasional *Lophelia pertusa* colonies are present. At 11m there is an interesting area of broken carbonate crust before the ROV proceeds downslope over broken carbonate boulders and cobbles, still hosting a similar assemblage **16m** **[6]:** continuing downslope sparse cobbles on gravelly sand display a sparse encrusting community. **18m** **[7]:** this becomes coarse gravelly/pebble and *Reteporella* bryozoans become more apparent, joined by stylasterids as before. **21m** **[8]:** An area of broken carbonate crust is again dominated by encrusting globose sponges (OTU75) although a couple of *L. pertusa* colonies are present. 23m The ROV proceeds over the top of this with no views of the seabed until **24m** **[9]:** a small area of higher broken carbonate hosts *L.pertusa* colonies, but the main assemblage here continues into the landscape beyond and is dominated by stylasterids and *Reteporella* sp. The ROV spends some time zooming here (possibly waiting for the ship to catch up/ROV pilot change) then comes off bottom and turns 180° back toward the small escarpment it just descended over. **31m** **[10]:** gravelly sand and scattered pebbles are sparsely colonised by urchins, before reaching **32m** **[11]:** an area of broken carbonate cobbles and boulders at the foot of the escarpment (with *Reteporella*) **33m** **[12]:** the escarpment feature consists of sloping carbonate and large boulders of broken carbonate/bedrock, *Desmophyllum cf dianthus* is found on overhanging carbonate crust, and a there are few *L. pertusa* colonies. The encrusting globose sponge again dominates upper surfaces. The ROV traverses left. **36m** **[13]:** gravelly sand and pebbles, occasional cobbles host urchins and sparse encrusting fauna. **38m** **[14]:** more escarpment (about 1m high), again encrusting sponges, purple anemones (OTU478), occasional *Lophelia* colonies and some other corals on the surface above. ROV turns corner 90° at 43m and follows crust back until just a shallow lip. **47m** **[15]:** cobbles on sand at top edge of escarpment (hydroids/sponges/cidaris). The ROV does a few turns then proceeds 180° to previous course, back over escarpment shelf. A similar cobbles on sand assemblage continues down slope then reaching a sloping terraced escarpment feature. 52m-55m limited views of seafloor. **55m** **[16]:** cobbles/boulders precede downslope in varying density on gravelly sand with *Reteporella* and *Stylaster* dominating. ROV turns 90° right at 1h03m, meets a *Trissopathes/Chrysopathes* black coral and stops for a moment to photograph. Then 45° turn upslope at 1h05m. **1h12m** **[17]:** meet the foot of a large (~4-5m) carbonate escarpment (and a Conger eel), ascend then traverse along left. Serpulids sparsely adorn the rock face, lines of *Desmophyllum cf dianthus* and rare *L. pertusa* colonies are also encountered. Views above show the stylasterid, *Reteporella* assemblage on cobbles. **1h37m** **[18]:** climb over the escarpment and head upslope over that cobble/boulder assemblage until **1h40m** **[19]:** small ~1m escarpment sparsely colonised, traverse right. **1h52m** **[20]:** climb over escarpment again cobbles, boulders, *Reteporella*. **1h54** **[21]:** Meet another step, stop but don't traverse, *Desmophyllum* and serpulids, **1h57m** **[22]:** cobbles and boulders, then sloped carbonate, back to cobble boulders, then broken carbonate boulders and cobbles, all with the *Reteporella* assemblage. **2h3m/21:29pm end of HD VIDEO.**

Physical Data			
Reef (types can be concurrent)	88% reef	88% geogenic	
		n/a	n/a
		n/a	
Substrates	<ul style="list-style-type: none"> - Bedrock - Broken Rock - Boulders - Carbonate - Cobbles - Gravel - Pebbles - Sand 		
Geomorphology/Features	<ul style="list-style-type: none"> - Cobbles/boulders - Sloping bedrock <p>Escarpment</p> <ul style="list-style-type: none"> - Broken bedrock - broken crust - cobble field - cobbles/boulders 		
Annex 1 Types	<ul style="list-style-type: none"> - Broken Rock - Cobble/Boulder Field - Sloping Bedrock - Vertical Rock 		
Pressures	<ul style="list-style-type: none"> - 7 x fishing line - 3 x fishing gear - 1 x fabric 		

Biological Data			
Number of Species		56 spp	
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)			
O.T.U	Name	Size	SACFOR
331	Acanthagorgia sp	L	R
478	Actiniaria sp 13 (pink/purple)	M	O
605	Actiniaria sp 20	M	R
976	Actiniaria sp 27 (pink)	M	R
278	Anthomastus grandiflorus	M	R
188	Araeosoma fenestratum	L	O
235	Bathynectes sp	L	O
1025	Beryx decadactylus	L	R
258	Brosme brosme	L	R
1077	Caridea (indet)	M	R
234	Ceramaster/Peltaster/Plinthaster sp 1	M	O
388	Ceremaster/Peltaster/Plinthaster sp 2	M	R
2	Ceriantharia	M	O
254	Chaceon affinis	L	R
1054	Chirostylidae (indet)	M	R
540	Chrysopathes sp/Trissopathes sp	L	O
211	Cidaris cidaris	M	F
82	Cirripedia sp	Mass	R
113	Colus sp	M	R
1100	Conger conger	L	O
43	Corallimorphidae sp 2	M	R
335	Desmophyllum cf dianthus	M	O
445	Echinus sp 1	M	R
1018	Epigonus telescopus	L	R
227	Helicolenus dactylopterus	L	O
56	Hydrozoa flat/branched	L	O
249	Lepidion eques	L	O
250	Lophelia pertusa	L	F
285	Majidae sp 2	M	R
1019	Merlangius merlangus	L	O
654	Molva molva	L	O
349	Mora moro	L	R
200	Munida sarsi	M	R
1026	Mysida (indet)	S	O
458	Pachycerianthus multiplacatus	M	R
205	Paguridae	M	R
57	Pandalus borealis	M	R
304	Paramola cuvieri	L	R
1050	Paramuricea sp	L	O
1020	Phycis blennoides	L	R
207	Pliobrothus sp	M	O
263	Porania pulvillus (poss stormi)	L	R
118	Porifera encrusting (black/red)	Crust	R
800	Porifera encrusting (blue)	Crust	R
75	Porifera encrusting globose (pale)	Mass	O
1	Porifera encrusting sp 1 (white)	Crust	R
30	Porifera encrusting sp 10 (yellow)	Crust	R
1101	Porifera lamellate (escarp)	M	R
252	Psolus squamatus	M	O
204	Reteporella sp 1	M	F
106	Serpulidae sp 1	M	O
569	Squaliformes sp	L	R
198	Stichastrella rosea	M	R
361	Stylaster sp 1	M	O
1017	Teuthidae (indet)	M	R
586	Zoanthidea sp 2	Mass	R

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtUB.Co.UrcCom	Urchin dominated community on Atlantic upper bathyal coarse sediment	
M.AtUB.Sa.UrcCom.CidUrc	Cidarid urchin assemblage on Atlantic upper bathyal sand	
(var) M.AtUB.Ro.DeeSpo	(encrusting variant of) Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	Deep-sea sponge aggregations (ICES/OSPAR); Hard-bottom sponge aggregations (ICES subcategory)
(var) M.AtUB.Ro.MixCor	(canyon/escarpment variant) Mixed cold water coral community on Atlantic upper bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Non-reefal scleractinian aggregations (ICES subcategory)
(var) M.AtUB.Ro.SpaEnc(.HydBry)	(variant) Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata (dominated by Hydrozoans [e.g. Stylaster/Pliobothrus] and Bryozoans [e.g. Reteporella])	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Stylasterid corals on hard substrata (ICES subcategory)
M.AtUB.Ro.SpaEnc	Sparse encrusting community on Atlantic upper bathyal rock and other hard substrata	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtUB.Sa.UrcCom.CidUrc 211 Ciaris cidaris	
2	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 361 Stylaster sp 1, 211 Ciaris cidaris	
3	M.AtUB.Co.UrcCom 211 Ciaris cidaris, 188 Araeosoma fenestratum	
4	(var) M.AtUB.Ro.DeeSpo, M.AtUB.Co.UrcCom 75 Porifera encrusting lobose (pale), 211 Ciaris cidaris	
5	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 106 Serpulidae sp 1, 361 Stylaster sp sp, 50 Hydrozoa bushy, 211 Ciaris cidaris	
6	M.AtUB.Ro.SpaEnc, M.AtUB.Co.UrcCom 107 Serpulidae sp 1, 188 Araeosoma fenestratum	
7	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 204 Reteporella sp, 211 Ciaris cidaris	
8	(var) M.AtUB.Ro.DeeSpo, M.AtUB.Co.UrcCom 75 Porifera encrusting lobose (pale), 211 Ciaris cidaris	
9	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Ro.MixCor 50 Hydrozoa (bushy), 75 Porifera encrusting lobose (pale)	

10	M.AtUB.Co.UrcCom 211 Cidaris cidaris
11	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 204 Reteporella sp, 211 Cidaris cidaris
12	(var) M.AtUB.Ro.MixCor, (var) M.AtUB.Ro.DeeSpo 335 Desmophyllum cf dianthus, 75 Porifera encrusting lobose (pale)
13	M.AtUB.Co.UrcCom, M.AtUB.Ro.SpaEnc 211 Cidaris cidaris)
14	(var) M.AtUB.Ro.MixCor, (var) M.AtUB.Ro.DeeSpo 478 Actiniaria sp 13, 75 Porifera encrusting lobose (pale)
15	M.AtUB.Co.UrcCom, (var) M.AtUB.Ro.DeeSpo 211 Cidaris cidris, 50 Hydrozoa (bushy), 75 Porifera encrusting lobose (pale)
16	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 207 Reteporella sp, 361 Stylaster sp 1, 188 Araeosoma fenestratum
17	(sparse, var) M.AtUB.Ro.MixCor, (var) M.AtUB.Ro.SpaEnc(.HydBry) 106 Serpulidae, 335 Desmophyllum cf dianthus
18	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 106 Serpulidae, 207 Reteporella sp, 361 Stylaster sp, 211 Cidaris cidaris
19	(sparse, var) M.AtUB.Ro.MixCor, (var) M.AtUB.Ro.SpaEnc(.HydBry) 106 Serpulidae, 211 Cidaris cidaris, 335 Desmophyllum cf dianthus
20	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 207 Reteporella sp, 211 Cidaris cidaris
21	(sparse, var) M.AtUB.Ro.MixCor, (var) M.AtUB.Ro.SpaEnc(.HydBry) 106 Serpulidae, 211 Cidaris cidaris, 335 Desmophyllum cf dianthus
22	(var) M.AtUB.Ro.SpaEnc(.HydBry), M.AtUB.Co.UrcCom 361 Stylaster, 50 Hydrozoa (bushy), 211 Cidaris cidaris

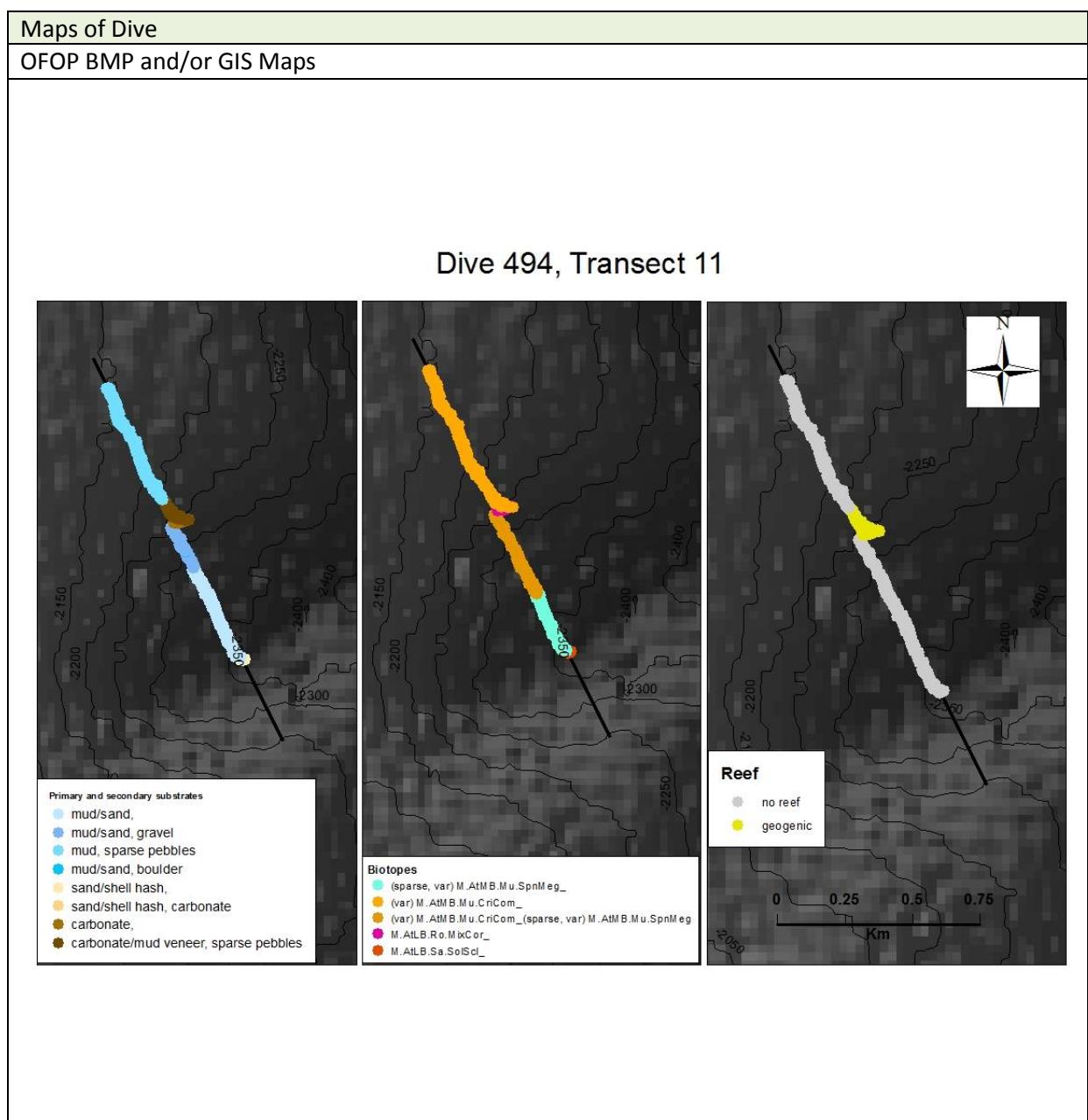
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens		
- Hard-bottom coral garden	OSPAR/ICES	
o Non-reef scleractinian aggregations	ICES subcategory	
o Stylasterid corals on hard substrata	ICES subcategory	
Deep-sea sponge aggregations	ICES subcategory	
- Hard-bottom sponge aggregations	OSPAR/ICES	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - Hydrozoan/bryozoan community on cobbles/boulders/bedrock/broken bedrock, Desmophyllum on overhangs, encrusting globose sponge patch - The encrusting sponge assemblage was also seen at T42 and are named equivalently. (There are poor images of this biotope in this transect: IMG_8346 is the best for comparison.) - There are many lost fishing gear/fishing lines are encountered on this dive. 		

DIVE SUMMARY	
DIVE #	TRANSECT #
494	11

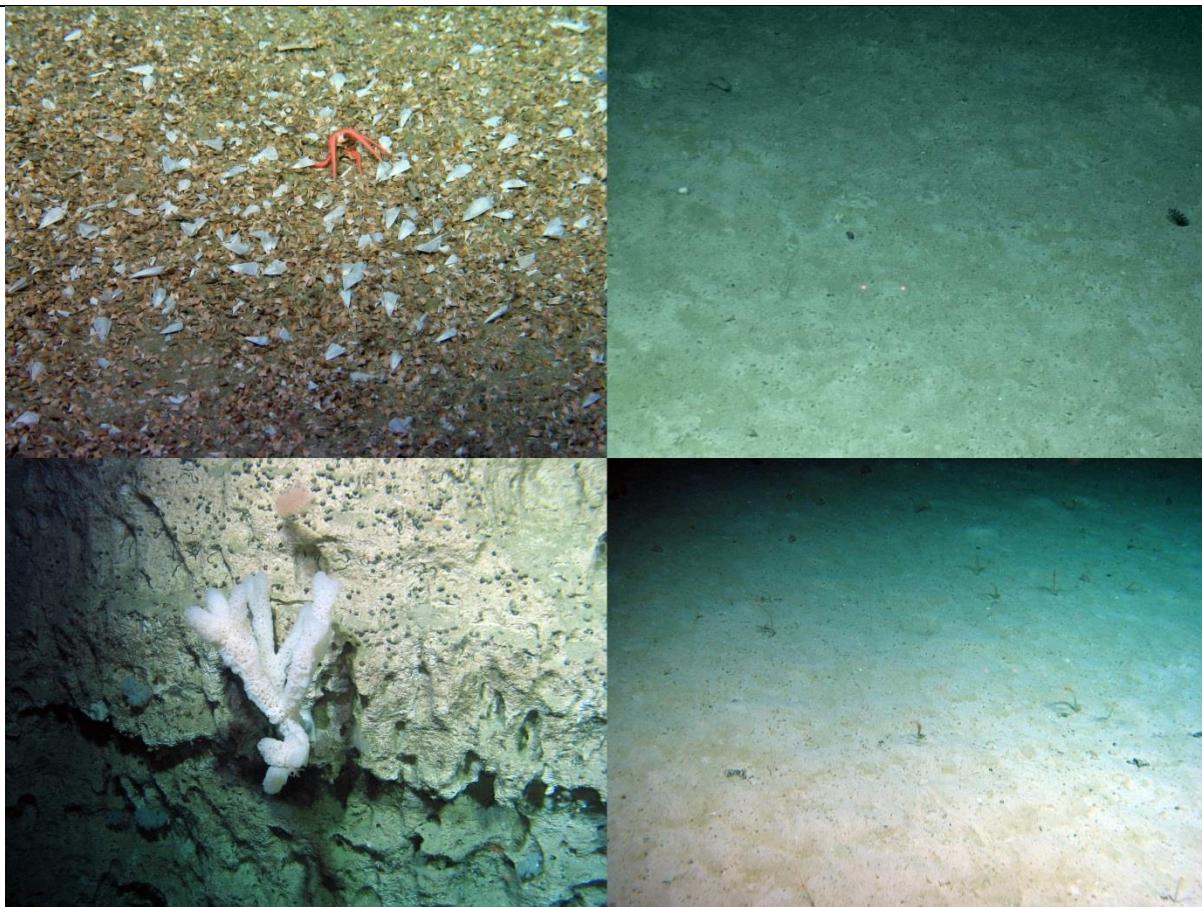
	Start	End
Date & Time	20/07/2017 03:34:23	20/07/2017 05:19:13
Latitude/ Longitude	54.1767855, -12.442037	54.187286, -12.450233
Depth	2311.65	2100
Images	IMG_8487-IMG_8566	
Samples	2 x pushcores	

Location	C9
Target Features	Canyon, Escarpment
Depth Range	2099.24-2311.65m (2204.955m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The transect starts (briefly) on an area of pteropod shell hash. There are interesting questions on why this area has such dense pteropod shells which transitions quickly to mud, and what caused these pteropods to die. This area was colonised by *Flabellum* sp. (M.AtLB.Sa.SolScl)

Top R. Part of this transect was spent over mud with sparsely distributed cf *Anthoptilum* sp seapens and mixed echinoderms. ((sparse, var) M.AtMB.Mu.SpnMeg)

Bottom L. The escarpment feature comprised of carbonate cliffs, hosting mixed sponges and Chrysogorgiid corals, along with black spots which may be fossil stalked crinoid anchor points. (M.AtLB.Ro.MixCor)

Bottom R. After the cliffs thinly veneered carbonate, thickly veneered/ mud sediment hosted denser aggregations of stalked crinoids. Mixed species were encountered where carbonate could be seen beneath the mud, but in deeper mud one species was mainly encountered, interpreted as *Democrinus* sp (OTU1103). ((var) M.AtMB.Mu.CriCom)

Summary Description (habitat transitions noted)			
<p>HD VIDEO STARTS AT 0m/03:34am [1] The transect starts on what looks like sand and shell hash from afar but two photos taken prior to the HD video show that is made up entirely of Pteropod (pelagic snail) shells. The ROV moves right passing some small carbonate feature, stopping after 30seconds before at 1m proceeding forwards slowly at first then normally by 2m [2] where the sediment transitions to mud. This area is presents with sparse cf Anthoptilum sea pens (OTU1107) and mixed echinoderms especially white echinoids (OTU559), <i>Ophiomuseum lymani</i> ophiuroids, <i>Hymenaster</i> sea stars, and <i>Mesothuria intestinalis</i> holothurians. 18m [3] While many of the previous fauna continue, the dominant fauna becomes stalked crinoids (probably <i>Democrinus</i> sp, OTU1103). 26-28m The ROV stops. 32m A strange clear object is encountered, possibly living (e.g. a tunicate or jellyfish) or litter, possibly attached to a stalked crinoid. 34m A boulder is encountered colonised by <i>Anachalypocrinus nefertiti</i>, shortly followed at 36m by another with mixed sponges/crinoids/corals associated. Two holes are visible behind the boulder suggesting a carbonate crust lies beneath the sediment. 44m [4] The ROV meets the escarpment feature in the form of a high (5m+) carbonate cliff. The cliff host mixed sponges (especially cf <i>Farreidae</i> OTU1142), Chrysogorgiid corals, and many unknown dark spots (likely fossil stalked crinoid anchor points). 53m [5] the ROV rises up the cliffs over a couple of terraces of mud veneered sloping carbonate, then onto continuous mud veneered sloping carbonate, densely colonised by mixed stalked crinoid species, among other fauna. Scattered/patchy pebbles are encountered, and by 1h06m the carbonate is no longer visible. 1h12m increasing numbers of Holothurians (possibly <i>Amperima</i> sp) become co-dominant with the stalked crinoids continuing until the end of the transect. 1h27m-1h35m the ROV stops for pushcores. 1h43m the ROV stops, and the HD VIDEO ENDS AT 1h44m/05:19am.</p>			

Physical Data				
Reef (types can be concurrent)	20 % Reef	20 % Geogenic		
		n/a	n/a	
			n/a	
Substrates	<ul style="list-style-type: none"> - boulder - carbonate - gravel - mud - pebbles - sand/(pteropod) shell hash 			
Geomorphology/Features	Canyon <ul style="list-style-type: none"> - small carbonate feature Escarpmement			
Annex 1 Types	<ul style="list-style-type: none"> - sloping rock - vertical rock 			
Pressures	<ul style="list-style-type: none"> - fishing line 			

Biological Data				
Number of Species		61 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
499	Actinaugue richardi?	M	R	
554	Actinernus sp	L	R	
582	Actiniaria sp 18 (sun)	M	R	
605	Actiniaria sp 20	M	R	
132	Actinostolidae sp 1	L	R	
1143	Ampheraster alaminos	M	R	
1031	Anachalypsicrinus nefertiti	L	O	
278	Anthomastus grandiflorus	M	R	
594	Anthoptilum grandiflorum	L	R	
1107	Anthoptilum sp	M	F	
146	Aphroditidae sp 1	M	R	
1141	Bathycrinidae sp	L	F	
1045	Bathycrinidae sp 2 cf Porphyrocrinus t	L	O	
328	Bathypathes sp 1	L	O	
432	Benthogone sp	M	R	
1077	Caridea (indet)	M	R	
1058	Caryophyllidae/Fabellidae (indet)	M	R	
2	Ceriantharia	M	R	
1142	cf Farreidae sp	L	O	
601	cf Geodia baretii (Porifera massive gl	L	O	
984	cf Halcampoididae sp	M	R	
1008	Chrysogorgidae sp 1	L	O	
1059	Colossendeis sp	L	R	
577	Coryphaenoides guentheri	L	O	
566	Coryphaenoides rupestris	L	R	
131	Crinoidea sp 1	M	R	
1103	Democrinus sp	M	C	
335	Desmophyllum cf dianthus	M	R	
572	Echinothuroidea sp (whiteDeep)	L	R	
559	Echinus sp	M	F	
1106	Eucaridea sp	M	R	
1056	Flabellum sp	M	R	
1144	Galatheoidea sp	M	R	
1113	Halosauridae sp	L	R	
542	Hippasteria phrygiana	M	R	
628	Holothuroidea sp 4 (cf Amperima)	M	F	
1110	Hymenaster sp	M	R	
274	Hymenodiscus coronata/ Brisinga end	L	R	
536	Mesothuria intestinalis	M	R	
349	Mora moro	L	R	
1102	Munnopsidae	M	R	
551	Ophiomuseum lymani	L	F	
1076	Ophiuroidae (indet)	S	R	
1083	Pennatulacea sp (thin)	L	R	
555	Phormosoma placenta	M	R	
1146	Poecilosclerida sp	L	O	
552	Polyacanthonotus rissoanus	L	O	
1145	Porifera bracket deep	L	R	
535	Porifera cup 2	L	R	
1075	Porifera cylindrical sp	L	R	
1	Porifera encrusting sp 1 (white)	Crust	R	
433	Pseudarchaster sp 1	M	R	
433	Pseudarchaster sp 1	M	R	
1079	Rhodaliidae sp	M	R	
1148	Serpulidae sp (black)	M	O	
547	Stauropathes arctica	L	R	
198	Stichastrella rosea	M	R	
440	Synaphobranchus kaupii	L	R	
581	Umbellula sp	L	R	
1147	Unknown black dots	M	O	
291	Zoarcidae sp 2	L	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
M.AtLB.Sa.SolScl	Solitary scleractinian field on Atlantic lower bathyal sand	(not dense enough)
(var) M.AtMB.Mu.CriCom	(lower bathyal stalked variant) Crinoid dominated community on Atlantic mid bathyal mud	Mud and sand emergent fauna (ICES)
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
(sparse, var) M.AtMB.Mu.SpnMeg	(sparse, lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	(not dense enough)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	M.AtLB.Sa.SolScl 1056 Flabellum sp	
2	(sparse, var) M.AtMB.Mu.SpnMeg 1107 Anthoptilum sp, 551 Ophiomuseum lymani, 559 Echinus sp	
3	(var) M.AtMB.Mu.CriCom, (sparse, var) M.AtMB.Mu.SpnMeg 1103 Democrinus sp, 551 Ophiomuseum lymani, 1107 Anthoptilum sp	
4	M.AtLB.Ro.MixCor 1142 cf Farreidae, 1008 Chrysogorgiidae sp	
5	(var) M.AtMB.Mu.CriCom 1103 Democrinus sp, 1141 Bathycrinidae sp, 628 Holothuroidea sp 4 (cf Amperima)	

Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens - Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	ICES/OSPAR ICES subcategory	
Mud and sand emergent fauna	ICES	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
- Area of dense pteropod hash, mud with sparse sea pens, carbonate cliffs with mixed sponges and Chrysogorgiid corals (and black fossil stalked crinoid anchor points), thin veneered carbonate with stalked crinoids		

DIVE SUMMARY	
DIVE #	TRANSECT #
495	8

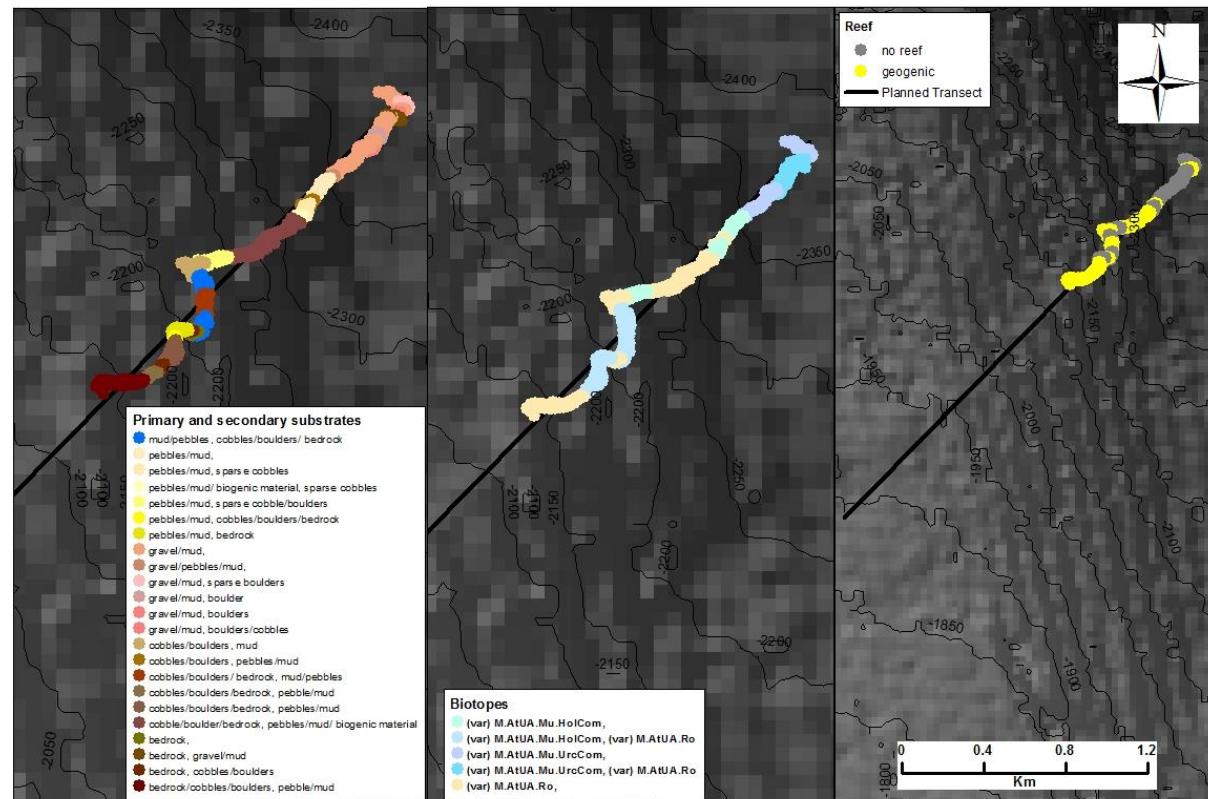
	Start	End
Date & Time	20/07/2017 10:45:23	20/07/2017 13:58:56
Latitude/ Longitude	54.18937567, -12.84365933	54.18407417, -12.852435
Depth	2331.18	2067.27
Images	IMG_8573-IMG_8712.JPG	
Samples	5 x sponges (various)	

Location	C10
Target Features	Canyon, Escarpment
Depth Range	2065.34-2331.55m (av. 2191.363m)

Maps of Dive

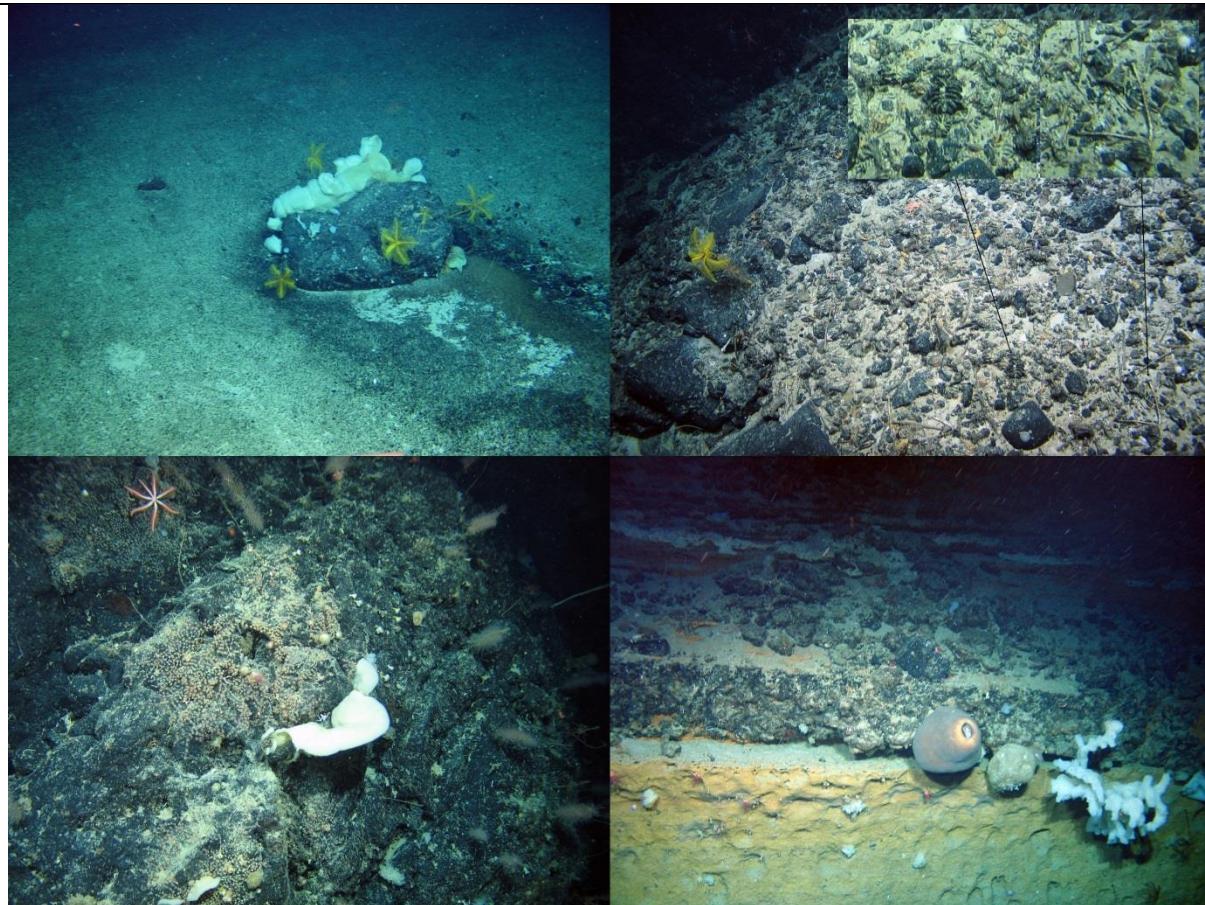
OFOP BMP and/or GIS Maps

Dive 495, Transect 8



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Gravel (sometimes pebbles) was found throughout the dive and sampling activity revealed it to be a veneer over mud. Mixed gravel/mud areas were dominated by either small white echinoids (OTU559) or holothurians cf *Laetmogone* sp (OTU432, purple). Boulders were often colonised by stalked crinoids (such as these *Anachalypsicrinus nefertiti*) sponges (here OTU1010) and corals. ((var) M.AtUA.Ro)

Top R. The gravel and pebbles encountered at the bottom of the main slope incorporated biogenic components. Inset L. suggests historic cup coral aggregations (probably *Desmophyllum* sp). Inset R. Stick-like components are most likely to be crinoid stalks but may originate from corals. Bedrock hosted mainly stalked crinoids but again corals and sponges were also common.

Bottom L. One of the more diverse parts of the slope, here chrysogorgiids are dominant (OTU1008), with a patch of zoanthids and lamellate sponges. ((var) M.AtUA.Ro)

Bottom R. An example of the different colours/types of rock that were co-occurring. The beige (fine-grain sedimentary?) was often pitted and hosted more sponges, especially the small branched Poecilosclerida sp (OTU1146). Here the dark rock hosted more stalked and comatulid crinoids. (Also seen here are two types of massive globose sponges: cf *Geodia baretti*(OTU601), 'muddy' globose (OTU1128), and a large cf *Farreidae* sp (OTU1142)).

Summary Description (habitat transitions noted)

HD VIDEO A STARTS 0m/10:45:23 [1] The transect starts on mixed substrate, gravel and mud, with small white echinoids (OTU559). ROV moves left. 2m Start encountering sparse boulders with stalked crinoids and sponges. 3m ROV moves diagonally left then diagonally right, stopping for imagery until 4m when ROV moves right then forwards away from boulders. **5m [2]** increased cobbles and boulders lead to a large smooth black bedrock protrusion hosting stalked crinoids (especially *Anachalypsicrinus nefertiti*)/sponges/corals on the hard substrate. ROV moves around protrusion left then right. Proceeds over gravel/mud to another small protrusion, here beige pitted rock. 9m ROV moves forwards away from protrusions, but encounters several boulders colonised similarly. Echinoids continue on the gravel/mud. **17m [3]** An extended area of gravel/mud with echinoids. Some pull from the ship makes the ROV move slowly and at 18m get pulled backwards. 25-26m stop and test sediment with arm, mud is shallow c 10cm before hitting hard substrate and the resistance lifts the ROV. There gravel starts transitioning to pebble size. **29m [4]** pebbles/gravel/mud, there are many small gastropods here (*cf Colus sp*), along with purple holothurians (*cf Laetmogone sp*, OTU432). Occasional cobbles until **35m [5]** denser cobbles/boulders with *A. nefertiti* dominating. **37m [6]** mud/sand and pebbles with occasional cobbles, again purple holothurians (*cf Laetmogone sp*) are abundant. There is increasing biogenic material in the mixed sediment, especially stick-like forms which may be crinoid stalks or coral skeletons. 40m one trawl mark was encountered before the slope angles uphill. **41m [7]** Stalked crinoids dominate cobbles and boulders and vertical black rock, with many sponges and corals also present. An extended cliff section is particularly diverse, with chrysogorgiids becoming abundant. 55-1h02m stop for sampling *Rhabdodictyum cf delicatum* (OTU611), 1h09-1h11m stop for imagery, 1h14-1h16m stop to sample another sponge (may be same species, but unknown). 1h24m reach the top of the cliff and proceed over horizontal bedrock. 1h28m-1h36m stop for imagery and sampling yellow *Rhabdodictyum cf delicatum* (OTU616). **1h39m [8]** again holothurians on mixed pebbles/mud, some cobbles present. **1h43m [9]** Area of steep cobbles/ boulders before the base of a small (conglomerate?) bedrock cliff, with cobbles/boulders on top (*A. nefertiti*). Another cliff feature becomes apparent which the ROV descends over stopping and a ledge at 1h49-1h54m to image and sample a lamellate sponge (possibly OTU1151). The base of the cliff is cobbles and boulders down to a flatter landscape at **1h56m [10]** Pebbles/mud host holothurians, and a step in the underlying bedrock is identifiable by the presence of large sponges and corals, while scattered boulders continue the hard substrate assemblage (especially *A. nefertiti*). 1h58m Stop for imagery. **HD VIDEO A ENDS 2h04m/12:49:43.**

HD VIDEO B STARTS 0m/12:50:33. 1-6m sampling small muddy globose sponge (OTU1128), here the pebble veneer is clear from using the scoop and leaving only mud behind. Proceed forward over more gravel/mud with scattered boulders. **17m [11]** another conglomerate cliff (black and beige rock) with stalked crinoids and corals 19-20m stop for imagery of small octopus on cliff. **22m [12]** mud/gravel with bedrock step features. 23m encounter strange fine grain sedimentary rock boulder 9beige, pitted) colonised by stalked crinoids and many *Poecilosclerida sp* (OTU1146) sponges, image around boulder. Several more smaller similar boulders/protrusions are encountered, ROV does some zigzagging around these. 44m Hard sedimentary rock slope up to area of **46m [13]** cobbles and boulders, then cliffs, some sedimentary (sponges especially abundant), some layers of black (conglomerate?) rock (comatulid crinoids abundant). Up to smooth sloping black bedrock to a summit area, with *A. nefertiti* and chrysogorgiids dominating. This forms a rolling plateau of rock with gullies filled with cobbles/boulders. ROV descend over edge to area of mixed sediment. 1h03m stop for pushcore before **END OF HD VIDEO 1h08m/13:58:56.**

Physical Data			
Reef (types can be concurrent)	60% reef	60 % geogenic	
		n/a	n/a
Substrates	<ul style="list-style-type: none"> - bedrock (black) - bedrock (beige) - biogenic gravel - boulders - cobbles - gravel/mud - pebbles/mud 		
Geomorphology/Features	<p>Canyon</p> <p>Escarpment</p> <ul style="list-style-type: none"> - beige rock (sedimentary?) - black rock (conglomerate?) - large boulder (pitted, beige) - mixed rock types - summit 		
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder field - horizontal bedrock - sloping bedrock - vertical bedrock 		
Pressures	<ul style="list-style-type: none"> - 1 x trawl mark 		

Biological Data					
Number of Species		65spp			
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)					
O.T.U.	Name	Size/Growth	SACFOR		
554	Actinernus sp	L	O		
4	Actiniaria sp 1	M	R		
605	Actiniaria sp 20	M	R		
132	Actinostolidae sp 1	L	R		
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	R		
1031	Anachalypsicrinus nefertiti	L	F		
278	Anthomastus grandiflorus	M	R		
594	Anthoptilum grandiflorum	L	O		
592	Antipatharia sp 4 cf Stauropathes	L	R		
1038	Asconema sp	L	R		
1173	Asterioidea (cf Ceremaster/Hymenaster, red/pink)	L	O		
471	Asteronyx loveni	M	R		
1041	Bathyocrinidae sp 1	L	F		
1045	Bathyocrinidae sp 2 cf Porphyrocrinus thalassae	L	O		
328	Bathyphantes sp 1	L	O		
1077	Caridea (indet)	M	R		
6	Caryophyllia sp	M	R		
2	Ceriantharia	M	R		
1142	cf Farreidae sp	L	O		
1182	cf Pythonaster sp	L	R		
1054	Chirotylidae (indet)	M	R		
1008	Chrysogorgidae sp 1	L	F		
113	Colus sp	M	O		
1105	Coryphaenoides armatus	L	R		
577	Coryphaenoides guentheri	L	R		
566	Coryphaenoides rupestris	L	R		
131	Crinoidea sp 1	M	R		
559	Echinidae sp (white)	M	O		
572	Echinothuroidea sp (whiteDeep)	L	O		
1144	Galatheoidea sp	M	R		
1113	Halosauridae sp	L	R		
1154	Henricia sp (deep)	M	R		
542	Hippasteria phrygiana	M	R		
432	Holothuroidea (cf Laetmogone) (purple)	L	F		
274	Hymenodiscus coronata/ Brisinga endacacnemos	L	O		
1067	Laucoraja sp	L	R		
557	Lepidisis sp	L	O		
536	Mesothuria intestinalis	M	R		
1126	Munnidopsis sp	M	R		
659	Octopodidae (indet)	L	R		
1076	Ophiuroidea (indet)	S	O		
1065	Paragorgia sp (deep pink)	L	O		
1161	Parantipathes sp (branched)	L	R		
255	Phelliactis sp 1	L	R		
1146	Poecilosclerida sp	L	O		
552	Polyacanthonotus rissoanus	L	O		
1030	Polymastia cf boletiformis	L	O		
1075	Porifera cylindrical sp	L	O		
1	Porifera encrusting sp 1 (white)	Crust	R		
1128	Porifera globose (muddy)	M	R		
1151	Porifera lamellate (Hexactinosida)	L	R		
1010	Porifera lamellate sp 12 (solen Assoc)	L	R		
1053	Porifera lamellate sp 13	L	O		
601	Porifera massive globose sp 11 cf Geodia baretii	L	O		
611	Porifera massive lobose sp 21 (Hertwigia?)	L	O		
616	Porifera massive lobose sp 22 (yellow of Hertwigia sp)	L	O		
83	Porifera massive lobose sp 6 cf Geodia sp	L	F		
106	Serpulidae sp 1	M	O		
573	Solaster endeca	L	R		
547	Stauropathes arctica	L	O		
440	Synaphobranchus kaupii	L	R		
1181	Telopathes sp 2 (red)	L	R		
1088	Unknown Hydrozoa/Bryozoa	M	R		
1149	Zoanthidea sp (sweetcorn)	Mass	R		
586	Zoanthidea sp 2	Mass	O		

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtUA.Mu.UrcCom	(mixed sediment variant of) Urchin dominated community on Atlantic upper abyssal mud	
(var) M.AtUA.Ro	(Stalked crinoids, sponges, and corals on) Atlantic upper abyssal rock and other hard substrata	Deep-sea sponge aggregations (ICES/OSPAR); Hard-bottom sponge aggregations (ICES subcategory); Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
(var) M.AtUA.Mu.HolCom	(mixed sediment variant) Holothurian dominated community on Atlantic upper abyssal mud	
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtUA.Mu.UrcCom 559 Echinidae sp (white)	
2	(var) M.AtUA.Mu.UrcCom, (var) M.AtUA.Ro 559 Echinidae sp (white), 1031 Anachalypsicrinus nefertiti	
3	(var) M.AtUA.Mu.UrcCom 559 Echinidae sp (white)	
4	(var) M.AtUA.Mu.HolCom 113 Colus sp, 432 Holothuroidea (cf Laetmogone) (purple)	
5	(var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti	
6	(var) M.AtUA.Mu.HolCom 432 Holothuroidea (cf Laetmogone) (purple)	
7	(var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti, 1008 Chrysogorgiidae sp	
8	(var) M.AtUA.Mu.HolCom 432 Holothuroidea (cf Laetmogone) (purple)	
9	(var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti	
10	(var) M.AtUA.Mu.HolCom, (var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti, 432 Holothuroidea (cf Laetmogone) (purple)	
11	(var) M.AtUA.Ro 131 Crinoidea sp, 1076 Ophiuroidea (indet)	
12	(var) M.AtUA.Mu.HolCom, (var) M.AtUA.Ro 432 Holothuroidea (cf Laetmogone) (purple), 551 Ophiomuseum lymani, 1031 Anachalypsicrinus nefertiti, 1146 Poecilosclerida sp	
13	(var) M.AtUA.Ro 1031 Anachalypsicrinus nefertiti, 1008 Chrysogorgiidae sp, 131 Crinoidea sp, 1146 Poecilosclerida sp, 83 Porifera massive lobose sp 6 (cf Geodia)	

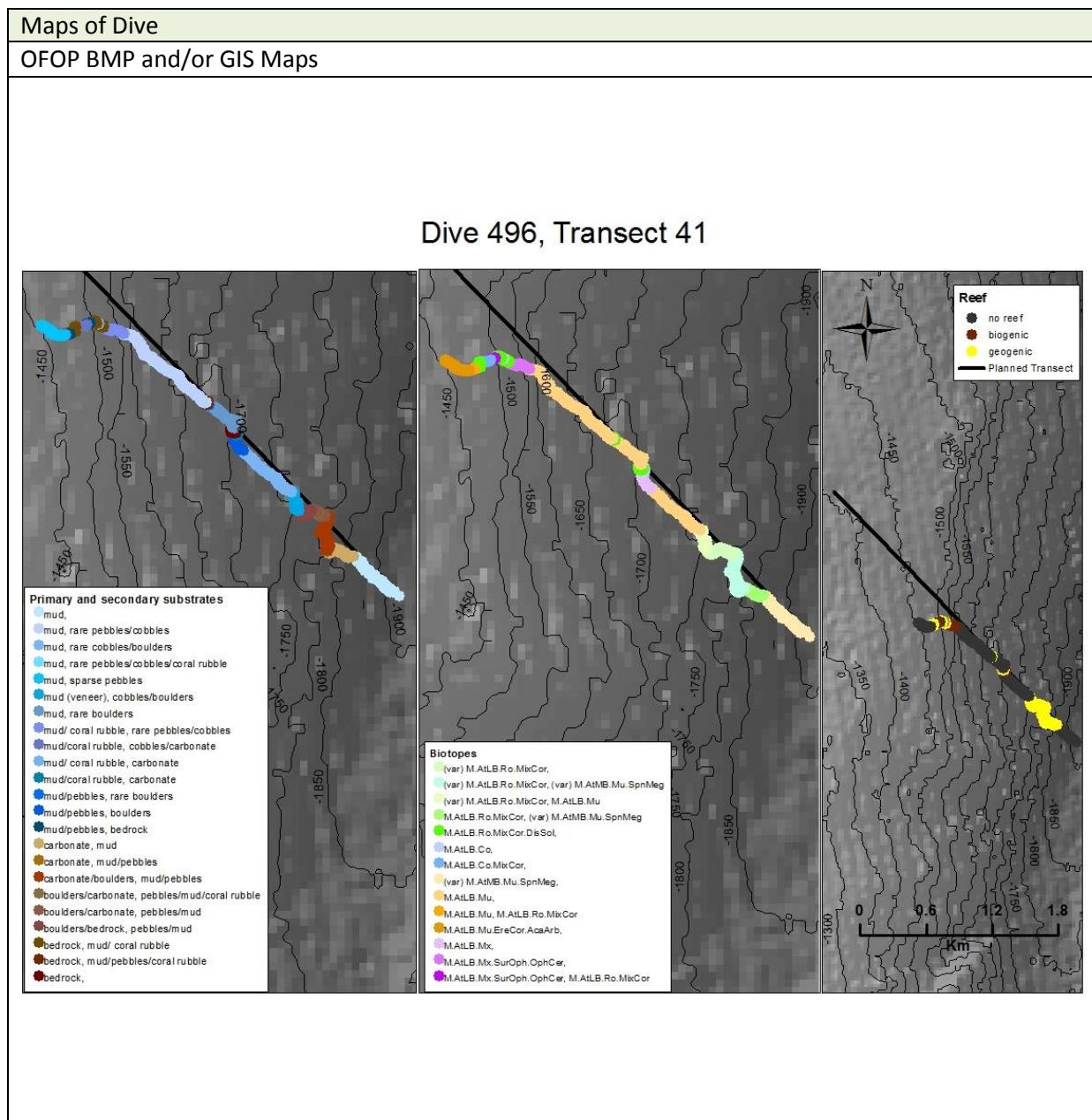
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Deep-sea sponge aggregations - Hard-bottom sponge aggregations	ICES/OSPAR ICES subcategory	
Coral gardens : - Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	ICES/OSPAR ICES subcategory	
Listed Species Encountered (Fish, Count)		
n/a	n/a	n/a

Additional Comments		
<ul style="list-style-type: none"> - Gravel veneered mud with echinoids/holothurians, cobbles/boulders and bedrock cliffs (different colours/textures) with stalked crinoids, mixed sponges, and Chrysogorgiids - Some interesting geology on this dive. - Compare assemblage to T5. Some similarities, but fewer large sponges and some dominant species from T5 not present here. 		

DIVE SUMMARY	
DIVE #	TRANSECT #
496	41

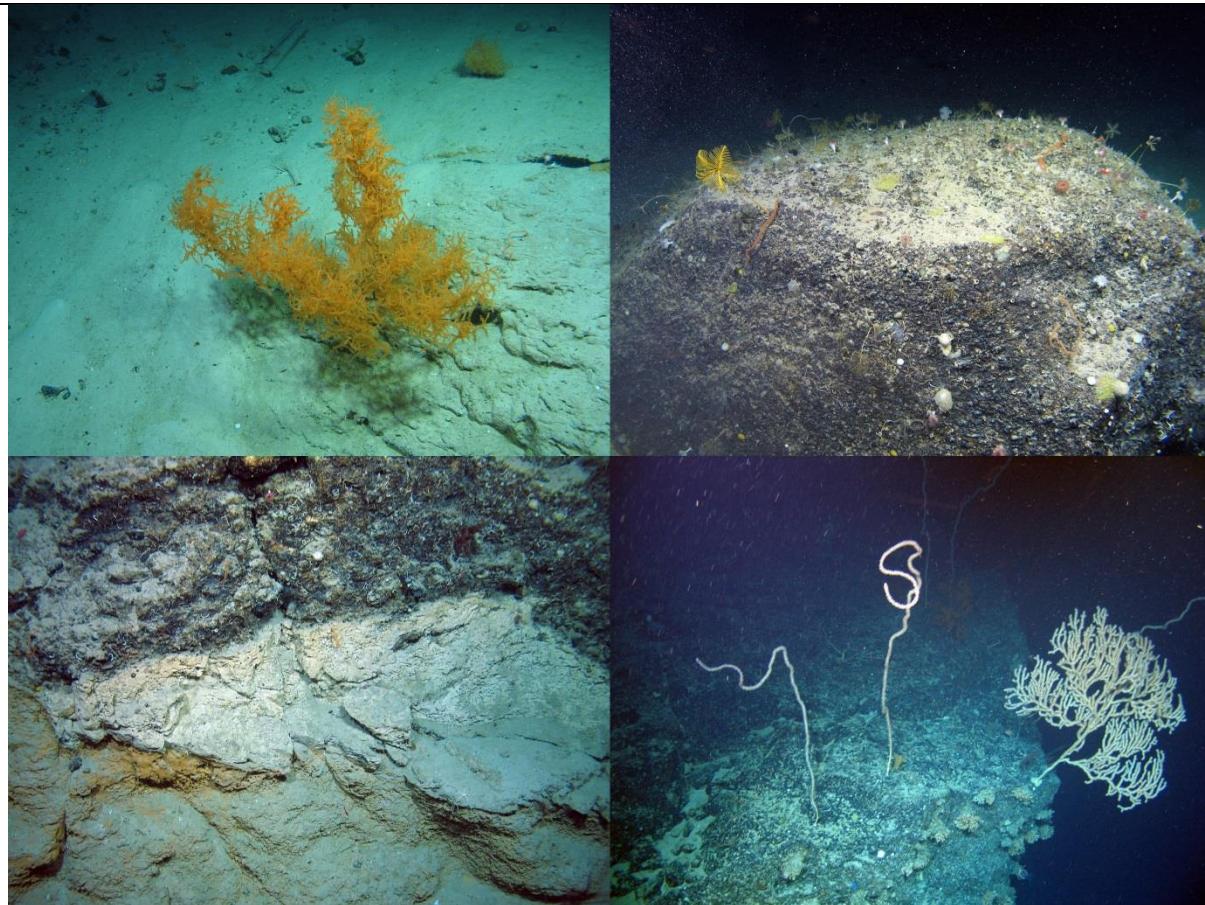
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Date & Time	20/07/2017 20:50:02	20/07/2017 22:19:16
Latitude/ Longitude	54.0673328, -12.6434508	54.0727655, -12.656747
Depth	1701.28	1420.08
Images	IMG_8714-IMG_9038.JPG	
Samples	1 x cf Geodia baretii (OTU601)	

Location	C10
Target Features	Canyon, Escarpment
Depth Range	1413.32-1869.28m (av. 1694.557m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. The first of the hard substrate on this dive was carbonate, presenting as terraces and patches of exposed rock. These are colonised by mixed corals especially *Stauropathes arctica*, *Stichopathes* sp (OTU560) and a few larger corals such as this *Leiopathes* sp. These could be with or without *Bathyocrinidae* sp. Nearby muddy substrate hosted thin sea pens (possibly *Distichoptilum* sp – hard to get a good enough view to ID). ((var) M.AtLB.Ro.MixCor, (var) M.AtMB.Mu.SpnMeg)

Top R. Overlaying the sloping/terraced carbonate were multiple dropstones of varying size, these hosted a slightly different community to the carbonate, especially through the presence of globose sponges and serpulid worms and much denser stalked or comatulid crinoid presence. ((var) M.AtLB.Ro.MixCor)

Bottom L. About half way through the transect a cliff face displays the transition from carbonate to black bedrock. ((var) M.AtLB.Ro.MixCor)

Bottom R. The second half of the transect often encountered bedrock protrusions, boulders and cliffs that hosted discrete colonies of *Solenosmilia varabilis* and mature erect corals such as these *Lepidisis* sp whip corals, *Keratoisis* sp bamboo coral fam, and *Leiopathes* sp orange antipatharians (in the background). These features were often preceded by a dead coral rubble apron below created from the colonies that have fallen from the vertical faces. (M.AtLB.Ro.MixCor.DisSol)

Summary Description (habitat transitions noted)

HD VIDEO A STARTS 0m/18:49:25 [1] mud with small thin sea pens that are hard to identify (OTU1083, possibly small *Distichoptilum sp?*). ROV moving left, 1m right, encounter colonised plastic bottle, 3m Moving straight ahead. **19m [2]** the sea pens continue but patches of exposed sloping and vertical terraced carbonate host mixed corals, especially *Staurophates arctica*. **29m [3]** while similar terraced carbonate and corals are present, stalked crinoids are now abundant and dominate the hard substrate epifauna, *Stichopathes sp* (OTU560) is often abundant. 34m drop stones and pebbles start being encountered, these are atop of the carbonate and its mud veneer, and have a slightly different community to the carbonate, with serpulids and lobose sponges (*cf Geodia*, OTU83) being especially abundant along with stalked crinoids and mixed corals. All of these communities and substrates are present and mosaicked as we continue upslope. 34-36m stopped to image dropstone, 41m moving right along slope. 43-44m imaging dropstone. 45-47m imaging *Leiopathes sp*. 48-49m imaging *Radicipes cf gracilis*, 50-51m imaging dropstones and *Leiopathes*. 52m ROV moving forward upslope, 54m ROV moving left. **55m [4]** the beginning of areas of denser cobbles and boulders overlaying the carbonate and mud veneer, the seepen biotope is no longer present. *Stichopathes sp*, *Bathyocrinidae sp* and the lobose sponges (OTU83) remain dominant. 1h05m-1h06m some coral rubble present at the base of a carbonate outcropping and a couple of *Solenosmilia variabilis* colonies are still live as discrete colonies on the rock face. 1h08m-1h10m imaging *Leiopathes*. Moving left, 1h11m forward upslope. 1h11m46s cliff face displays transition from carbonate to black bedrock. 1h12m moving left along cliff face of bedrock, again serpulids and sponges are abundant amongst the other fauna. 1h12m moving slow with several stops to image large sponges. 1h14m top of cliff visible, *Stichopathes sp* are abundant on the top surface along with a *Radicipes cf gracilis*. 1h15m moving left along cliff edge and slightly down cliff face. 1h20m-1h29m stopped to sample *cf Geodia baretti* (OTU601) then move left along shelf/cliff face. 1h32m ascend and head upslope. **1h36m [5]** mud now dominates, although is sometimes only a thin veneer over underlying bedrock. Cobbles and boulders carry the majority of fauna, continuing the mixed corals and stalked crinoid community. **1h48m15s [6]** mud with rare cobbles boulders, although some epifauna are present there are no clear dominant species. **END OF HD VIDEO A. 1h59m/20:49:10. START OF HD VIDEO B.** **0m/20:50:02.** 5m ROV now too high. **6m [7]** mud and pebbles with scattered/patchy boulders, too high to see dominant fauna. 7m moving diagonally right. **8m [8]** find dead coral (*Solenosmilia variabilis*) rubble apron on carbonate slope and start moving upslope. **9m [9]** meet bedrock feature with discrete *Solenosmilia variabilis* colonies on vertical faces and move left around and up, finding mature erect corals on the summit, especially *Lepidisis sp* among others. Proceed over summit, **15m [10]** descend otherside (brief blue water) meeting mud downslope and heading along slope, meeting rare small boulders. 23m-24m stopped to image *Aphroditidae sp*. **26m [11]** meet large boulder/outcropping and circle. It again hosts *Solenosmilia variabilis* and large erect corals with coral rubble around the base. **31m [12]** turn back along transect and proceed (blue water briefly) back over mud slope with occasional boulders (slight deviations to look at boulders). 42-43m stopped to image sponge. 46m many juvenile *Hoplostethus atlanticus* are encountered on this mud slope. Transition along and upslope. **1h00m [13]** beginning of coral rubble apron, angle further upslope over coral rubble. 1h02m moving right along and slightly upslope. **1h05m [14]** Meet bedrock outcroppings, well colonised by discrete *Solenosmilia variabilis* colonies and *Acesta excavata* clams. **1h10m [15]** another rubble apron, 1h10m-1h11m stopped to image octopus. **1h11m [16]** again bedrock with *S. variabilis* on vertical faces. **1h13m [17]** mud and pebble slope with *Ophiomuseum lymani* and bedrock outcroppings with mixed corals especially *Stichopathes sp*. **1h15m [18]** rubble apron. **1h17m [19]** bedrock outcrop with *S. variabilis* and mature erect corals (e.g. *Jasonisis sp*) and sponges especially on the top ledge. Track along ledge edge. 1h22m-1h23m Imaging *Keratoisis sp*. **1h23m [20]** mud with sparse pebbles, no dominant fauna, and sporadic bedrock protrusions with continued mixed corals and sponges. **1h24m [21]** mud with sparse pebbles and *Acanella arbuscula*. 1h25m ROV too high, 1h26-1h27m can't see bottom, only blue water. 1h27m back on bottom until **END OF HD VIDEO B 1h29m/22:19:16.**

Physical Data			
Reef (types can be concurrent)	58% reef	53% geogenic	
		5% biogenic	<1% living >99% dead
Substrates	<ul style="list-style-type: none"> - bedrock - boulder - carbonate - cobbles - coral rubble - mud - pebbles 		
Geomorphology/Features	Canyon Escarpmnt <ul style="list-style-type: none"> - cobbles/boulders - terraced carbonate - large boulder/outcropping - dropstones 		
Annex 1 Types	<ul style="list-style-type: none"> - cobble/boulder - sloping/vertical rock - coral rubble fields 		
Pressures	<ul style="list-style-type: none"> - 2 x plastic (bottle/packet) - 1 x fishing line tangle 		

Number of Species		107 spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U.	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	O	1070 Jasonisis sp (pinkSolenoAssoc)
1062	Acesta excavata	M	R	578 Keratoisidae sp 2
554	Actinermus sp	L	O	305 Leiopathes sp
605	Actinaria sp 20	M	R	1160 Lepidion guentheri
930	Actinopterygii sp 3	M	R	557 Lepidisis sp
1047	Actinoscyphidae sp 1 (pink)	L	R	1126 Munnidopsis sp
132	Actinostolidae sp 1	L	O	1102 Munnopsidae
1066	Adamsia sp (Paguridae Associated)	M	R	563 Neocytthus helgae
1074	Alepocephaliformes sp 1 cf Rouleina attrita	L	O	1087 Novodinia sp
1031	Anachalypsicrinus nefertiti	L	R	659 Octopodidae (indet)
278	Anthomastus grandiflorus	M	R	551 Ophiomuseum lymani
146	Aphroditidae sp 1	M	R	205 Paguridae spp
591	Ascidiae sp (clear)	M	R	1065 Paragorgia sp (twiggy)
20	Asciidaea sp 2	M	R	1050 Paramurexia sp
1038	Asconema sp	L	O	1161 Parantipathes sp (branched)
650	Asconema sp (Porif mass glob 14)	M	R	1042 Parantipathes sp (unbranched)
471	Asteronyx loveni	M	R	1183 Pennatula inflata
1041	Bathycriidae sp 1	M	F	1083 Pennatulacea sp (thin)
284	Bathyphathes sp (brown)	L	O	436 Pentametrocirrus atlanticus
1077	Caridea (indet)	M	R	255 Phelliactis sp 1
1058	Caryophyllidae/Fabellidae (indet)	M	R	555 Phormosoma placenta
1111	Cataetyx laticeps	L	R	1020 Phycis blennoides
2	Ceriantharia	M	R	1050 Plexauridae sp
574	cf Benthogone sp (white)	L	O	552 Polyacanthonotus rissoanus
1142	cf Farreidae sp	L	R	1030 Polymastia cf boletiformis
1176	cf Grimpoteuthis sp?	M	R	263 Porania pulvillus (poss stormi)
984	cf Halcampoididae sp	M	R	800 Porifera encrusting (blue)
1049	cf Psolus sp	M	R	1 Porifera encrusting sp 1 (white)
1054	Chirostylidae (indet)	M	R	30 Porifera encrusting sp 10 (yellow)
1008	Chrysogorgidae sp 1	L	R	1178 Porifera globose/lobose (indetWhite)
39	Corallimorphidae sp 1 (dark)	M	R	1156 Porifera lamellate (bubbles)
1105	Coryphaenoides armatus	L	R	422 Porifera lamellate sp 7
577	Coryphaenoides guentheri	L	O	601 Porifera massive globose sp 11 cf Geodia baretii
566	Coryphaenoides urepstris	L	R	648 Porifera massive globose sp 13
1072	Crinoidea sp (10 arm)	L	R	1051 Porifera massive globose sp 15 (solenoRubbleAssoc
131	Crinoidea sp 1	M	O	137 Porifera massive globose sp 6
131	Crinoidea sp 1 (red)	M	R	83 Porifera massive lobose sp 6 (cf Geodia)
1108	Distichoptilum gracile	L	R	380 Porifera tubular (cf Asconema foliatum)
559	Echinidae sp (white)	M	R	1090 Porifera tubular glassy (cf Farreidae)
572	Echinothuroidea sp (whiteDeep)	L	R	1162 Porifera vase (cf Aphrocallistes)
649	Eknomisidae sp	L	O	433 Pseudarchaster sp 1
1056	Flabellum sp	M	R	1044 Radicipes cf gracilis
1166	Guttiagaudia latifrons	M	R	106 Serpulidae sp 1
1113	Halosauridae sp	L	O	573 Solaster endeca
936	Harriotta raleighana	L	R	700 Solenosmilia variabilis
432	Holothuroidea (cf Laetmogone) (purple)	L	O	569 Squaliformes sp
651	Hoplostethus atlanticus (juv)	L	F	547 Stauropathes arctica
1039	Hydrolagus cf affinis	L	O	560 Stichopathes sp
56	Hydrozoa flat/branched	L	R	440 Synaphobranchus kaupii
1125	Hygrosoma sp	L	O	1181 Telopathes sp 2 (red)
274	Hymenodiscus coronata/ Brisinga endacacnemos	L	F	446 Trachychnus sp
1078	Inopidae sp	M	R	581 Umbellula sp
1064	Irididae sp (fine branching)	L	R	586 Zoanthidae sp 2
1070	Jasonisis sp (pinkSolenoAssoc)	L	O	291 Zoarcidae sp 2

Biotope List (Marine Habitat Classification for Britain & Ireland)

Code	Name	Listed
(var) M.AtLB.Ro	(Stalked crinoids, sponges, and corals on) Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden; Hard-bottom gorgonian and black coral gardens (ICES subcategory)
(var) M.AtMB.Mu.SpnMeg	(lower bathyal variant) Sea pens and burrowing megafauna on Atlantic mid bathyal mud	Sea-pen and burrowing megafauna communities (OSPAR); Seapen fields (ICES)
M.AtLB.Co	Atlantic lower bathyal coarse sediment	
M.AtLB.Co.MixCor	Mixed cold water coral community on Atlantic lower bathyal coarse sediment	

M.AtLB.Mu	Atlantic lower bathyal mud	
M.AtLB.Mu.EreCor.AcaArb	Acanella arbuscula assemblage on Atlantic lower bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Mx	Atlantic lower bathyal mixed sediment	
M.AtLB.Mx.SurOph.OphCe r	Ophiomusium lymani and cerianthid anemone assemblage on Atlantic lower bathyal mixed sediment	
M.AtLB.Ro.MixCor	Mixed cold water coral community on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtLB.Ro.MixCor.DisSol	Discrete Solenosmilia variabilis colonies on Atlantic lower bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Colonial scleractinians on rocky outcrops (ICES subcategory)
Biotope progression per habitat transition (# species, dominant/characteristic species)		
1	(var) M.AtMB.Mu.SpnMeg 1083 Pennatulacea sp (thin)	
2	M.AtLB.Ro.MixCor, (var) M.AtMB.Mu.SpnMeg 547 Stauropathes arctica, 1083 Pennatulacea sp (thin)	
3	(var) M.AtLB.Ro, (var) M.AtMB.Mu.SpnMeg 1041 Bathycrinidae sp, 106 Serpulidae, 83 porifera massive lobose (cf Geodia), 560 Stichopathes sp, 1083 Pennatulacea sp (thin)	
4	(var) M.AtLB.Ro 560 Stichopathes sp, 1041 Bathycrinidae sp, 83 porifera massive lobose (cf Geodia), 106 Serpulidae	
5	(var) M.AtLB.Ro, M.AtLB.Mu 560 Stichopathes sp, 1041 Bathycrinidae sp	
6	M.AtLB.Mu no dominant spp	
7	M.AtLB.Mx no dominant spp	
8	M.AtLB.Co no dominant spp	
9	M.AtLB.Ro.MixCor.DisSol 700 Solenosmilia variabilis, 557 Lepidisis sp	
10	M.AtLB.Mu no dominant spp	
11	M.AtLB.Ro.MixCor.DisSol 700 Solenosmilia variabilis, 557 Lepidisis sp	

12	M.AtLB.Mu no dominant spp
13	M.AtLB.Mx.SurOph.OphCer 551 Ophiomuseum lymani
14	M.AtLB.Ro.MixCor.DisSol 700 Solenosmilia variabilis, 1062 Acesta excavata
15	M.AtLB.Co 551 Ophiomuseum lymani
16	M.AtLB.Ro.MixCor.DisSol 700 Solenosmilia variabilis, 274 Hymenodiscus coronata/Brisinga endacacnemos
17	M.AtLB.Mx.SurOph.OphCer, M.AtLB.Ro.MixCor 551 Ophiomuseum lymani, 560 Stichopathes sp
18	M.AtLB.Co.MixCor 551 Ophiomuseum lymani, 1042 Parantipathes sp (unbranched)
19	M.AtLB.Ro.MixCor.DisSol 700 Solenosmilia variabilis
20	M.AtLB.Mu, M.AtLB.Ro.MixCor 1010 Porifera lamellate sp 12
21	M.AtLB.Mu.EreCor.AcaArb 585 Acanella arbuscula

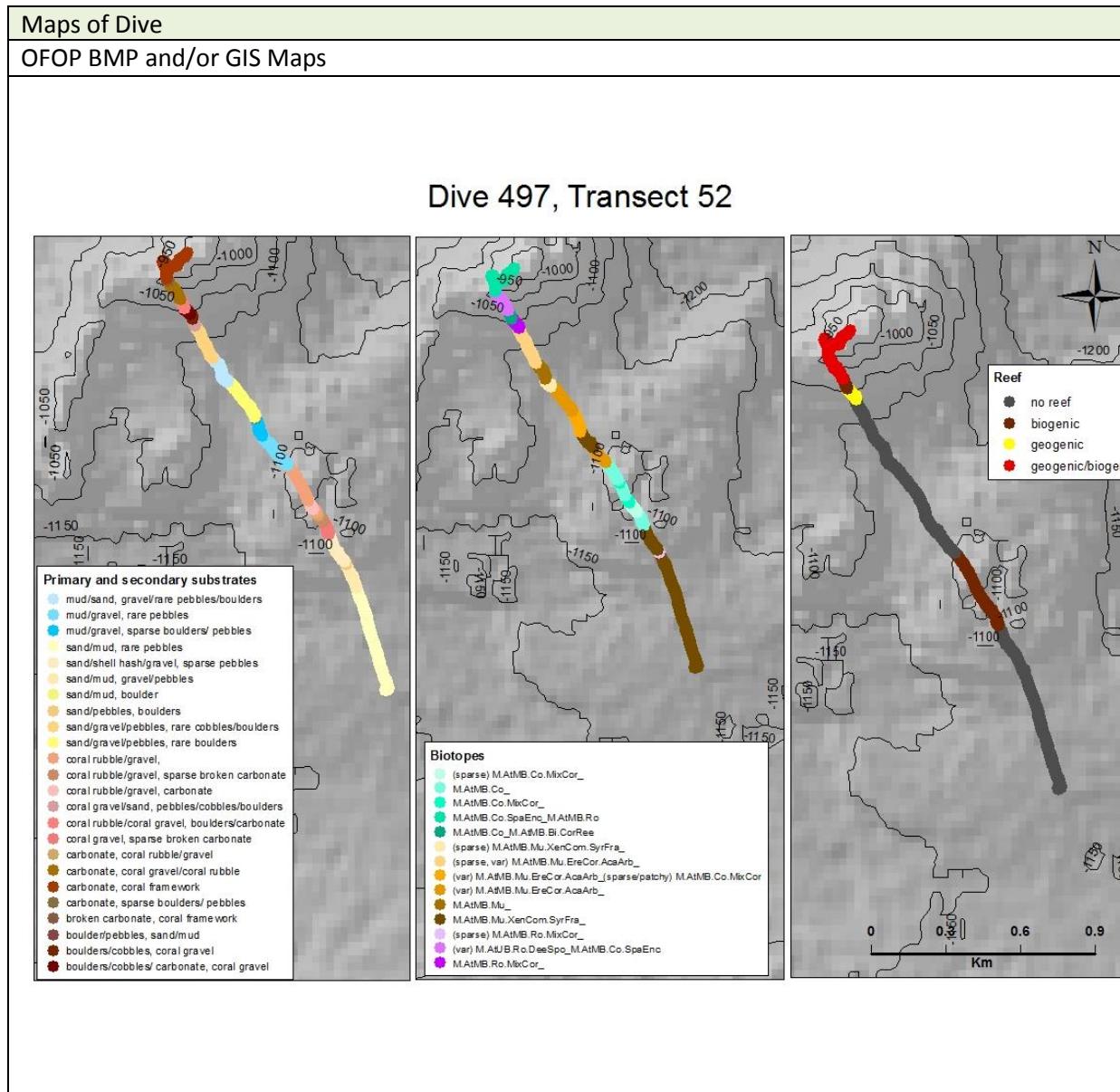
Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens	ICES/OSPAR	
- Hard-bottom coral garden <ul style="list-style-type: none"> o Colonial scleractinians on rocky outcrops o Hard-bottom gorgonian and black coral gardens 	ICES subcategory	
- Soft-bottom coral garden <ul style="list-style-type: none"> o Soft-bottom gorgonian and black coral gardens 	ICES subcategory	
Sea-pen and burrowing megafauna communities	OSPAR	
Seapen fields	ICES	
Listed Species Encountered (Fish, Count)		
Hoplostethus atlanticus (juvenile)	52	OSPAR/IUCN

Additional Comments	
<ul style="list-style-type: none"> - Mixed sloping/vertical rock types with stalked crinoids and mature erect corals, some giant boulders/bedrock protrusions with Solenosmilia colonies and rubble aprons. 	

DIVE SUMMARY	
DIVE #	TRANSECT #

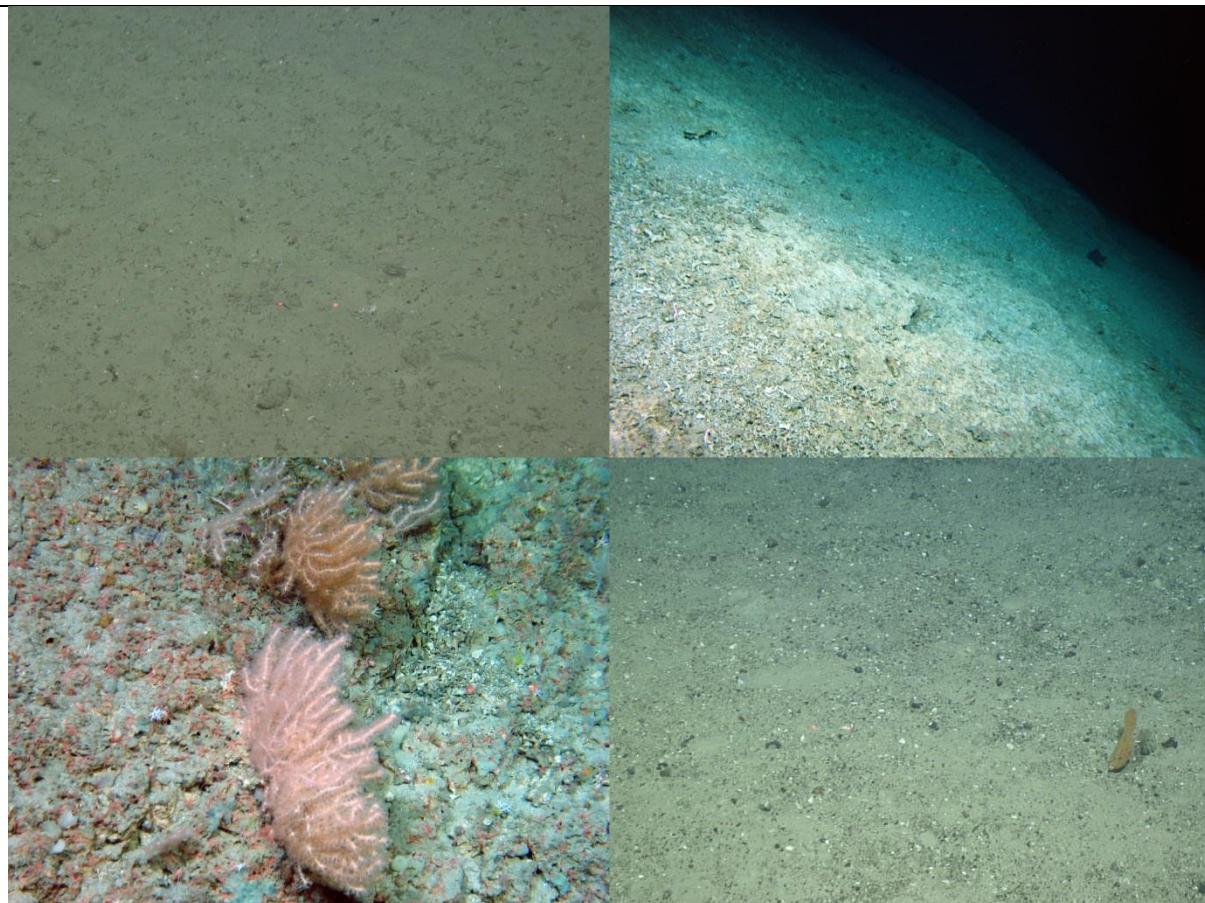
	Start	End
Date & Time	21/07/2017 03:00:35	21/07/2017 05:55:57
Latitude/ Longitude	54.0544575, -12.51120667	54.07124667, -12.52291683
Depth	1107.21	878.74
Images	IMG_9039-IMG_9174.JPG	
Samples	3 x Sponges (inc. <i>Pheronema carpenteri</i>), 1 x <i>Madrepora oculata</i>	

Location	Between C9 and C10
Target Features	Carbonate mound (<i>Pheronema carpenteri</i> aggregations/ Scleractinian Reef)
Depth Range	878.74-1107.44m (av 1053.888m)



Representative Images

(Images representative of major biotopes, species, and sediments encountered throughout the transect)



Top L. Xenophyophores (*Syringammina fragilissima*) on mud/sand occupy the first quarter of the transect, often with *Acanella arbuscula* (M.AtMB.Mu.XenCom.SyrFra)

Top R. Two carbonate mound features clearly previously hosted vast coral reefs. The reefs are now all destroyed, presenting as coral rubble/gravel on carbonate. These are deep mounds for Lophelia pertusa, so the reefs may have died due to environmental change, but the framework which could host larger corals has definitely been trawled into an even gravel/rubble layer over most of the area. (M.AtMB.Co)

Bottom L. A small patch of carbonate/coral rubble mosaic on the slope near the summit of the first mound hosted a dense stand of *Jasonisis* corals and ophiuroids. (M.AtMB.Co.MixCor)

Bottom R. The saddle area between mounds was mostly populated by *Acanella arbuscula* in mixed sand/gravel/pebble substrate. ((var) M.AtMB.Mu.EreCor.AcaArb)

Summary Description (habitat transitions noted)

HD VIDEO A STARTS 0m/03:00am [1] (after working with a GoPro for ROV beauty shots) Start at a transition point between an area with cup corals and a boulder into fields of xenophyophores with *Acanella arbuscula* on mud with rare pebbles. 15m-28m stop for imagery and the sampling of two sponges (one rock boring, and one globose). 45m increasing pebbles and gravel. 47m sampling *Pheronema carpenteri* (only a couple spotted on this dive). **57m [2]** an area of denser pebbles, and sparse protruding bedrock/boulders hosts sparse mixed corals and small lamellate sponges. **58m [3]** return to mud/sand and pebbles with Xenophyophores and *Acanella*. 1h06m increasing coral gravel. 1h15m increasing coral rubble (larger chunks) until **1h16m [4]** mixed corals, sparse at first, including *Paramuricea sp*, a pink sparse-branching gorgonian (OTU307). 1h17m sloping carbonate/broken carbonate underlies the coral rubble. 1h20m a dense area of *Jasonisis sp*. **1h23m [5]** summit of the first carbonate mound covered in even coral rubble/gravel with no visible epifauna, likely trawled. The ROV starts moving downhill with only partial/poor views of seabed. **1h26m [6]** One brief area of the slope hosts mixed erect corals (*Paramuricea sp & Jasonisis sp*) on coral rubble. **1h27m [7]** continuing downhill over coral rubble/gravel, several large Alepocephaliformes (possibly *Rouleina attrita*) and *Chimera opalescens* are lingering here (no dominant epifauna). **1h30m [8]** Reach saddle area between carbonate mounds. *Acanella arbuscula* dominates on coral rubble and mud. **1h36m [9]** xenophyophores on mud/ gravel still some *A. arbuscula*. **1h43m [10]** ROV passes over edge of patch with boulders and lamellate sponges and corals, while sand/gravel/shell hash continue to host *A. arbuscula*. Scattered boulders host a similar community, mosaicked with the coarse sediment until **1h49m [11]** The coarse sand/gravel and *A. arbuscula* dominate. Then at 1h57m Xenophyophores return, sparse *A. arbuscula*. **HD VIDEO A ENDS 2h01m/05:02am. HD VIDEO B STARTS 0m/05:03am [13]** sparse epifauna on mud/sand **4m [14]** *A. arbuscula* returns, and several encounters with Orange Roughy (*Hoplostethus atlanticus*). 12m increasing coral gravel and rubble indicates the base of the next carbonate mound. **15m [15]** the slope becomes steeper and boulders/cobbles, interspersed with coral gravel, host mixed corals, especially *Leiopathes sp*. 17m Carbonate and coral rubble. 18m-26m stop to sample small colony of *Madrepora oculata* and take imagery. **27m [16]** Dense coral rubble and boulders (one possibly with trawl scrape marks), ophiuroids clearly dominant when up close. **31m [17]** more exposed carbonate with encrusting globose sponges (OTU75) visibly dominant and continued ophiuroids. 32m strange scratch marks possibly from a trawl. 36m one small patch with more intact dead framework and a couple of small *Lophelia pertusa* colonies on broken a carbonate edge (not enough to form a biotope transition). **38m [18]** no more encrusting globose sponges, just sparse epifauna, mainly ophiuroids visible in close ups. 39m Before reaching the summit the ROV stands heading downhill (with poor views), then at 42m stops after touching the seabed, and 43m turns uphill continuing over coral rubble/gravel and carbonate. **HD VIDEO B ENDS 05:55am.**

Physical Data			
Reef (types can be concurrent)	38 % reef	21 % Geogenic	
		32 % Biogenic	0 % living 100 % dead
Substrates	<ul style="list-style-type: none"> - boulders - broken carbonate - carbonate - cobbles - coral framework - coral gravel - coral rubble - gravel - mud/sand - pebbles - shell hash 		
Geomorphology/Features	Canyon Interfluve Carbonate Mound <ul style="list-style-type: none"> - summit - boulder/cobble field Saddle (between Carbonate Mounds)		
Annex 1 Types	<ul style="list-style-type: none"> - boulder/cobble field - coral rubble fields/dead coral structures 		
Pressures	<ul style="list-style-type: none"> - 1 x glass bottle - 3 x possible trawl marks - 1 x possible carpet? 		

Biological Data				
Number of Species		72spp		
Summary Species List (Operational Taxonomic Unit, Name, Size, SACFOR)				
O.T.U	Name	Size/Growth	SACFOR	
585	Acanella arbuscula	L	F	
608	Acanthogorgia cf armata	L	O	
930	Actinopterygii sp 3	M	R	
1006	Actinopterygii sp 4	M	R	
1074	Alepocephaliformes sp 1 cf Rouleina atl	L	O	
278	Anthomastus grandiflorus	M	R	
1131	Apristurus sp (indet) - juv	L	O	
258	Brosme brosme	L	O	
280	Callogorgia verticillata	L	R	
1077	Caridea (indet)	M	R	
1058	Caryophyllidae/Fabellidae (indet)	M	O	
388	Ceremaster/Peltaster/Plinthaster sp 2	M	R	
2	Ceriantharia	M	O	
289	cf Clavulariidae sp	Mass	R	
254	Chaceon affinis	L	O	
653	Chimera opalescens	L	O	
1054	Chirostylidae (indet)	M	R	
1008	Chrysogorgidae sp 1	L	R	
82	Cirripedia sp	Mass	R	
303	Coelorhynchus coelorhynchus	L	R	
566	Coryphaenoides rupestris	L	R	
1015	Dendrobathypathes sp	L	R	
279	Echinoidea sp1	L	R	
649	Eknomisis sp	L	R	
307	Gorgonacea sp 7 (pink) cf Isidella	L	R	
208	Henricia sanguinolenta	M	R	
628	Holothuroidea sp 4	M	R	
651	Hoplostethus atlanticus	L	O	
1098	Hormathiidae sp	L	R	
917	Hyalonema sp 1 (shortForm)	L	R	
274	Hymenodiscus coronata/ Brisinga enda	L	R	
1070	Jasonisis sp (pinkSolenoAssoc)	L	O	
305	Leiopathes sp	L	R	
612	Leiopathes/Dendrobathypathes?	L	O	
249	Lepidion eques	L	F	
557	Lepidisis sp	L	R	
250	Lophelia pertusa	L	O	
273	Lophius piscatorius	L	O	
251	Madrepora oculata	L	R	
654	Molva molva	L	R	
349	Mora moro	L	O	
339	Munida tenuimana	M	R	
563	Neocytus helgae	L	O	
659	Octopodidae (indet)	L	R	
1050	Paramuricea sp	L	R	
1081	Phanopathes sp	L	O	
347	Pheronema carpenterii	L	O	
555	Phormosoma placenta	M	R	
552	Polyacanthonotus rissoanus	L	R	
263	Porania pulvillus	L	R	
115	Porifera boring sp 1	Mass	R	
800	Porifera encrusting (blue)	Crust	R	
13	Porifera encrusting (green)	Crust	R	
75	Porifera encrusting globose (pale)	Mass	F	
1	Porifera encrusting sp 1 (white)	Crust	R	
30	Porifera encrusting sp 10 (yellow)	Crust	R	
1010	Porifera lamellate sp 12 (solen Assoc)	L	R	
422	Porifera lamellate sp 7	M	O	
606	Porifera lamellate sp 9	L	R	
137	Porifera massive globose sp 6	M	R	
982	Porifera massive lobose sp 30	M	R	
652	Rajiformes sp 1 poss Neoraja caerulea	L	R	
1134	Scyphozoa sp (indet)	M	R	
106	Serpulidae sp 1	M	R	
569	Squaliformes sp	L	O	
198	Stichastrella rosea	L	R	
560	Stichopathes sp	L	R	
440	Synaphobranchus kaupii	L	R	
261	Syringammina fragilissima	M	F	
446	Trachychynus sp	L	O	
1123	Unknown Mud Fluff (Hydro/Foram)	S	F	
532	Unknown sp 26 (Sabellidae?)	Mass	R	

Biotope List (Marine Habitat Classification for Britain & Ireland)		
Code	Name	Listed
(var) M.AtMB.Mu.EreCor.Aca Arb	(Mixed sediment variant of) Acanella arbuscula assemblage on Atlantic mid bathyal mud	Coral gardens (ICES/OSPAR); Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens (ICES subcategory)
(var) M.AtUB.Ro.DeeSpo	(mid bathyal encrusting variant of) Deep sponge aggregation on Atlantic upper bathyal rock and other hard substrata	
M.AtMB.Co	Atlantic mid bathyal coarse sediment	
M.AtMB.Co.MixCor	Mixed cold water coral community on Atlantic mid bathyal coarse sediment	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtMB.Co.SpaEnc	Sparse encrusting community on Atlantic mid bathyal coarse sediment	
M.AtMB.Mu	Atlantic mid bathyal mud	
M.AtMB.Mu.XenCom. SyrFra	Syringammina fragilissima field on Atlantic mid bathyal mud	Mud and sand emergent fauna (ICES)
M.AtMB.Ro.MixCor	Mixed cold water coral community on Atlantic mid bathyal rock and other hard substrata	Coral gardens (ICES/OSPAR); Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens (ICES subcategory)
M.AtMB.Bi.CorRee	Atlantic mid bathyal cold water coral reef (biogenic structure)	
M.AtMB.Ro	Atlantic mid bathyal rock and other hard substrata	

Biotope progression per habitat transition (# species, dominant/characteristic species)	
1	M.AtMB.Mu.XenCom.SyrFra 261 Syringammina fragilissima, 1123 Unknown mud fluff, 585 Acanella arbuscula
2	(sparse) M.AtMB.Ro.MixCor 422 Porifera lamellate sp 7
3	M.AtMB.Co, M.AtMB.Mu.XenCom.SyrFra 261 Syringammina fragilissima, 585 Acanella arbuscula
4	M.AtMB.Co.MixCor 1050 Paramuricea sp, 30 Porifera encrusting yellow, 307 Gorgonacea sp 7 cf Isidella, 1070 Jasonisis sp, 1076 Ophiuroidea (indet)
5	M.AtMB.Co no dominant sp
6	M.AtMB.Co.MixCor 1070 Jasonisis sp, 1050 Paramuricea sp
7	M.AtMB.Co [1074 Alepocephaliformes (cf Rouleina attrita), 653 Chimera opalescens] no dominant epifauna
8	(var) M.AtMB.Mu.EreCor.AcaArb 585 Acanella arbuscula
9	M.AtMB.Mu.XenCom.SyrFra 261 Syringammina fragilissima, 585 Acanella arbuscula
10	(var) M.AtMB.Mu.EreCor.AcaArb, (sparse/patchy) M.AtMB.Co.MixCor 585 Acanella arbuscula, 1010 Porifera lamellate sp 12 (solen Assoc)
11	(var) M.AtMB.Mu.EreCor.AcaArb 585 Acanella arbuscula
12	(sparse) M.AtMB.Mu.XenCom.SyrFra 261 Syringammina fragilissima
13	M.AtMB.Mu no dominant sp
14	(sparse, var) M.AtMB.Mu.EreCor.AcaArb 585 Acanella arbuscula
15	M.AtMB.Ro.MixCor 305 Leiopathes sp
16	M.AtMB.Co, M.AtMB.Bi.CorRee 1076 Ophiuroidea (indet)
17	(var) M.AtUB.Ro.DeeSpo, M.AtMB.Co.SpaEnc 75 Porifera encrusting globose, 1076 Ophiuroidea (indet)
18	M.AtMB.Co.SpaEnc, M.AtMB.Ro 1076 Ophiuroidea (indet)

Conservation Targets		
Listed Habitats Encountered		
Name	Authority	
Coral gardens (ICES/OSPAR); - Soft-bottom coral garden: Soft-bottom gorgonian and black coral gardens - Hard-bottom coral garden: Hard-bottom gorgonian and black coral gardens	ICES/OSPAR ICES subcategory ICES subcategory	
Mud and sand emergent fauna	ICES	
Listed Species Encountered (Fish, Count)		
Hoplostethus atlanticus	7	IUCN/ OSPAR

Additional Comments	
<ul style="list-style-type: none"> This transect encounters vast areas of old dead Scleractinian reef (likely <i>Lophelia pertusa</i> rather than <i>Solenosmilia variabilis</i>, despite the depth). The reefs have likely been trawled (given the evenness of the rubble), but may have died due to environmental conditions, as this is on the limit of the depth range for <i>Lophelia pertusa</i> (leaving brittle dead coral framework which is easier to trawl though). The dead framework however would host many other large coral species (and does in a couple of small patches) if it were still present. 	

References

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