

# 2017 North Sea Expedition: PRELIMINARY REPORT



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## 1. INTRODUCTION

The North Sea is one of the most productive seas in the world, with a wide range of plankton, fish, seabirds, and organisms that live on the seafloor. It harbours valuable marine ecosystems like cold water reefs and seagrass meadows, and rich marine biodiversity including whales, dolphins, sharks and a wealth of commercial fish species. It is also of high socio-economic value due to its fisheries, oil and gas extraction, harbours and industry – which in turn have also made it one of the busiest, most highly disturbed seas in the world. North Sea marine ecosystems have been under tremendous pressure for hundreds of years, and few areas of the seabed are untouched by fishing, particularly bottom trawling.



A well-designed and effectively managed network of MPAs is key to addressing threats to marine ecosystems. MPAs that are properly designed and well-managed help to build ecosystem resilience, and they support and contribute to a wide variety of environmental priorities:

- Conserving biodiversity, including protecting rare and threatened species and habitats.
- Reversing global and local declines in fish populations and productivity by protecting crucial nursery, breeding and feeding grounds.
- Providing resistance and resilience to change in diverse marine communities. This helps to buffer them against threats such as climate change and alien species.

- Protecting and maintaining ‘ecosystem goods and services’, like commercial fishing, upon which humans are highly dependent.
- Reducing negative fisheries impacts on target and non-target species, including bycatch, discards and direct physical impacts from destructive practices such as trawling and dredging.
- Reducing the impacts of other threats, such as eutrophication and pollution.

In order to achieve the full range of benefits above, the North Sea network of MPAs must be strengthened. Currently, the majority of MPAs are coastal and therefore fail to adequately protect offshore species, including commercially exploited ones. Furthermore, many existing MPAs lack effective management, which limits their potential to achieve their intended aims.

To be able to identify priority areas for protection, and to improve management of existing areas, there is a need to improve our knowledge and understanding of North Sea marine ecosystems and species. Despite a long history of marine research in the region, some areas of the North Sea remain poorly studied and documented, especially in offshore and deeper waters.

## 1.1 Objective

Oceana carried out a two-month expedition in June-August 2017, with the aim of documenting coastal and offshore areas in the waters of five North Sea countries: Denmark, Germany, the Netherlands, Norway, and the United Kingdom.

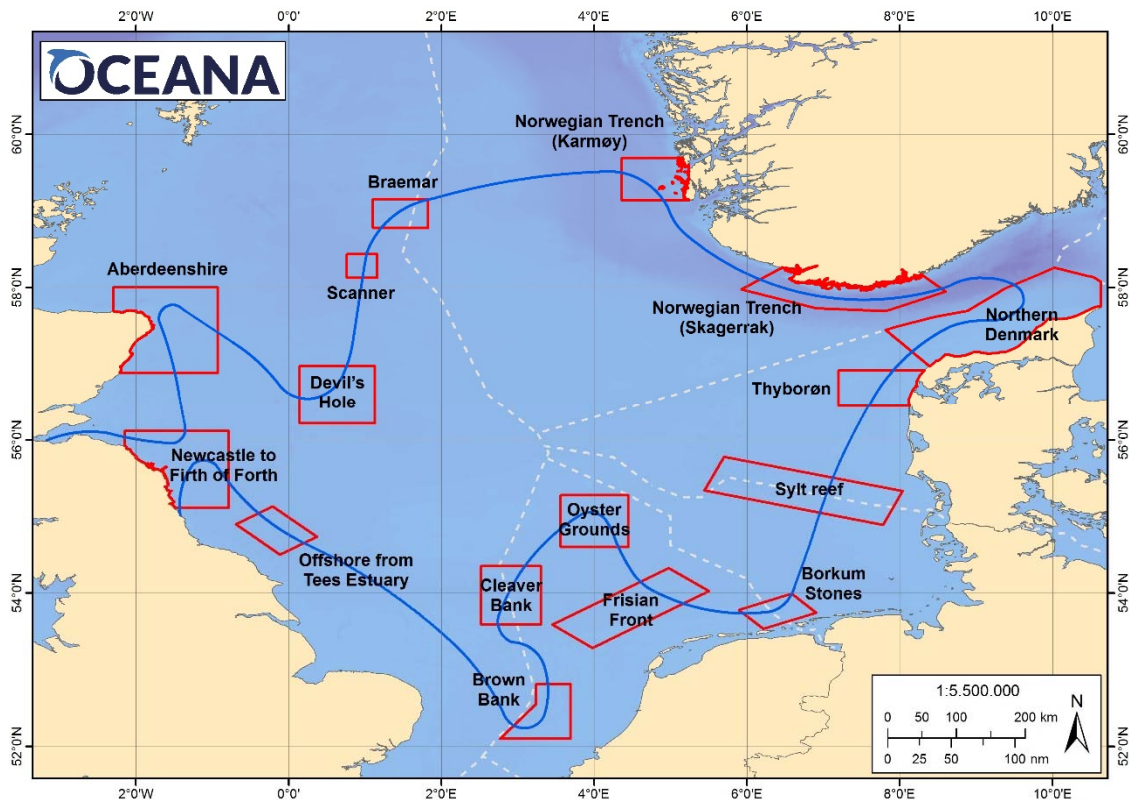
The main aims of this at-sea expedition were to document fish species, habitats and communities in selected areas of the North Sea, and to gather first-hand information from those areas where data are especially lacking, in order to advance the protection of new areas that are important for biodiversity. Oceana’s overall goal is to contribute to the declaration of a **larger network of marine protected areas** within the North Sea, and to help strengthen the management of existing protected areas.

## 2. METHODOLOGY

Oceana visited a total of 16 areas in the North Sea (see route map – Figure 1), two of which are areas of potential ecological importance in Norway. Both of them were part of the Norwegian Trench, an area that reaches depths of more than 400 m, and where important ecosystems are known to occur, such as gorgonian and sponge gardens, together with commercial species. Surveys of these zones were carried out onboard the research survey vessel *MV Neptune*, a fully-equipped vessel of 49.85 m overall length and 10 m extreme breadth.

In each area, the seabed was explored mostly by visual means, using a remotely operated vehicle (ROV) with a high-definition camera, and a team of professional divers composed of photographers and videographers. For ROV image recording, a Saab Seaeye Falcon DR ROV was used, equipped with a High Definition Video (HDV) camera of 480 TVL with Minimum Scene Illumination 2.0 LUX (F1.4), Pick Up Device ½" CCD, Image Sensor, and spherical ½ of 3.8 mm and wide-angle lenses. During ROV transects, images were recorded both in high definition and low resolution, and simultaneously documented position, depth, course and time. Lasers on the ROV were used in order to estimate sizes and abundances. Considering the average speed and the wide angle of the camera (i.e., it was able to film transects of ca. 1.5 m width), the ROV allowed the observation of around 550-650 m<sup>2</sup> per hour of seabed. Samples of key habitat-forming species were also collected (by means of the robotic arm of the ROV and directly by SCUBA divers) for detailed analyses to confirm preliminary identification.

Figure 1. Expedition route



Together with the ROV, a series of sediment samples were collected with a Van Veen grab from soft bottoms. In total, the sampling carried out in Norwegian waters is summarised as follows:

- 27 ROV dives
- 16 Scuba dives
- 15 Sediment grabs
- 94 biological samples
- Around 2500 underwater SCUBA photos
- Around 2000 underwater SCUBA videos
- Around 1200 underwater ROV HD videos



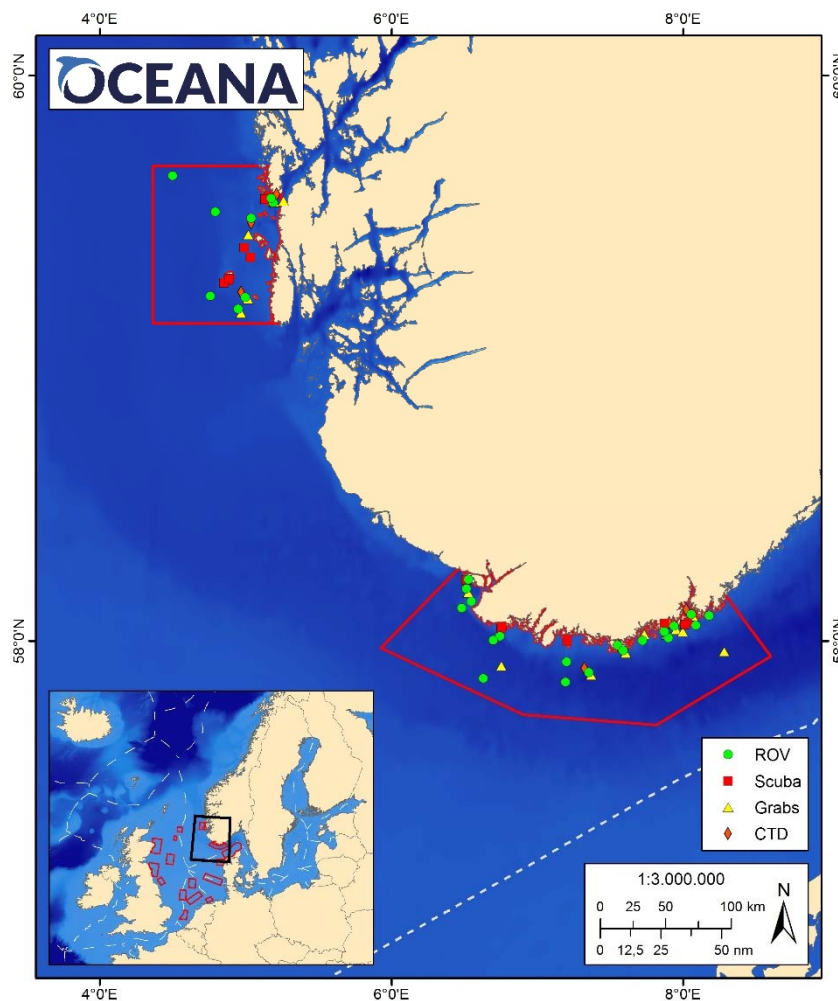
### 3. RESULTS

In total, Oceana documented roughly 400 species across a diverse range of habitats. Most of the survey areas were dominated by soft bottoms (i.e., sand and mud), sometimes also with pebbles and rocky areas. Other habitats of interest included: areas characterised by cnidarians, with a high abundance of anemones, and occasionally soft corals, sea-pens and gorgonians, kelp forests, and sponge aggregations.

Among the areas surveyed, there were some that appeared to provide important habitat for a range of commercial fishes, such as cod (*Gadus morhua*) and flatfishes (e.g., *Limanda limanda*, *Microstomus kitt*), elasmobranchs such as *Chimaera monstrosa* and crustaceans such as Norway lobster (*Nephrops norvegicus*) and edible crab (*Cancer pagurus*) in high abundance.

The expedition also documented impacts of widespread human disturbance, including evidence of bottom trawling, marine litter, and extensive infrastructures such as oil platforms, cables, and wind farms.

Figure 2. Sampling done in Norwegian areas



More detailed information from each of the surveyed areas (ROVs, grabs and species lists) is presented below.

**a. Area 1: Norwegian trench - Karmøy**

ROV 1							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
10/07/201	9:50	10:07	11:27	58° 39,327' N	4° 29,842' E	278	Sand, Mud

IDENTIFIED TAXA

- *Arnoglossus laterna*
- *Astropecten irregularis*
- *Astrorhiza limicola*
- cf. *Balanophyllia* sp.
- *Bolinopsis infundibulum*
- *Bolocera tuedaie*
- *Brosme brosmie*
- *Ceramaster granularis*
- *Chaetaster longipes*
- *Chlamys* sp.
- *Ciocalypta penicillus*
- *Conocrinus lofotensis*
- *Crangon crangon*
- *Didemnum* cf. *maculosum*
- *Eualus gaimardii*
- *Filograna implexa*
- *Foraminifera*
- *Funiculina quadrangularis*
- *Galathea intermedia*
- *Galathea* sp.
- *Galeus melastomus*
- *Halcampoides* sp.
- *Haliclona urceolus*
- cf. *Henricia* sp.
- *Hormathia digitata*
- *Hydroides norvegica*
- *Hymedesmia paupertas*
- *Kinetoskias* cf. *smithii*
- *Kophobelemnion stelliferum*
- *Lebbeus polaris*
- *Lithodes maja*
- *Lycodes* cf. *gracilis*
- *Meganyctiphanes norvegica*
- *Mesothuria intestinalis*
- *Molva molva*
- *Munida sarsi*
- *Nephrops norvegicus*
- *Neptunea despecta*
- *Pagurus* sp.
- *Pandalus borealis*
- *Parasitic isopoda*
- cf. *Parasmittina trispinosa*
- *Parastichopus tremulus*
- cf. *Plagioecia patina*
- *Pollachius virens*
- *Polycarpa pomaria*
- *Polyclinum aurantium*
- *Protoptilum carpenteri*
- *Raja clavata*
- *Sabella tube*
- *Sebastes viviparus*
- *Siphonophore*
- *Spirontocaris liljeborgii*
- *Terebratulina retusa*



ROV 2							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
10/07/201	13:38	13:51	15:00	59° 31,809' N	4° 47,387' E	227	Mud, rocks, boulders

## IDENTIFIED TAXA

- |                                     |                                       |
|-------------------------------------|---------------------------------------|
| - <i>cf. Amphilectus fucorum</i>    | - <i>Hippoglossoides platessoides</i> |
| - <i>Amphipoda</i>                  | - <i>Hydroides norvegicus</i>         |
| - <i>Antho dichotoma</i>            | - <i>cf. Hydrozoa</i>                 |
| - <i>Antho sp.</i>                  | - <i>cf. Hymedesmia jecusculum</i>    |
| - <i>Aplidium glabrum</i>           | - <i>Hymedesmia paupertas</i>         |
| - <i>Aplysilla rosea</i>            | - <i>Hymedesmia sp.</i>               |
| - <i>Aplysilla sulfurea</i>         | - <i>Kinetoskias cf. smithii</i>      |
| - <i>Ascidia conchilega</i>         | - <i>Lebbeus polaris</i>              |
| - <i>cf. Ascidia sp.</i>            | - <i>Lycodes cf. gracilis</i>         |
| - <i>Ascidacea sp.</i>              | - <i>Meganyctiphanes norvegica</i>    |
| - <i>Astropecten irregularis</i>    | - <i>Mesothuria intestinalis</i>      |
| - <i>Astrorhiza limicola</i>        | - <i>cf. Micromesistius poutassou</i> |
| - <i>Axinella infundibuliformis</i> | - <i>Munida rugosa</i>                |
| - <i>cf. Axinella rugosa</i>        | - <i>Munida sarsi</i>                 |
| - <i>Beroe cucumis</i>              | - <i>Munida sp.</i>                   |
| - <i>Cerianthus lloydii</i>         | - <i>Mycale lingua</i>                |
| - <i>Chaetaster longipes</i>        | - <i>Omalosecosa ramulosa</i>         |
| - <i>Ciocalypta penicillus</i>      | - <i>Pagurus pubescens</i>            |
| - <i>cf. Clathria laevis</i>        | - <i>Pagurus sp.</i>                  |
| - <i>Colus gracilis</i>             | - <i>Pandalus montagui</i>            |
| - <i>Craniella zetlandica</i>       | - <i>cf. Parasmittina trispinosa</i>  |
| - <i>Cyanea capillata</i>           | - <i>Parastichopus tremulus</i>       |
| - <i>Filograna implexa</i>          | - <i>Phakellia ventilabrum</i>        |
| - <i>Foraminifera</i>               | - <i>Polycarpa pomaria</i>            |
| - <i>Funiculina quadrangularis</i>  | - <i>Polyclinum aurantium</i>         |
| - <i>Galathea intermedia</i>        | - <i>cf. Quasillina brevis</i>        |
| - <i>Galathea sp.</i>               | - <i>Sabella pavonina</i>             |
| - <i>Galeus melastomus</i>          | - <i>Sabella sp.</i>                  |
| - <i>Geodia barretti</i>            | - <i>Sepiolo atlantica</i>            |
| - <i>Geodia macandrewii</i>         | - <i>cf. Serpula vermicularis</i>     |
| - <i>Halecium halecinum</i>         | - <i>Sertularella gayi</i>            |
| - <i>Halichondria bowerbanki</i>    | - <i>Suberites carnosus</i>           |
| - <i>cf. Haliclona cratera</i>      | - <i>Terebratulina retusa</i>         |
| - <i>Haliclona urceolus</i>         | - <i>Trisopterus esmarkii</i>         |

ROV 3							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
10/07/201	18:52	18:59	20:27	59° 30,490' N	5° 02,081' E	106	Rocks, cobbles, sand

#### IDENTIFIED TAXA

- *Aequipecten sp.*
- *cf. Amphilectus fucorum*
- *Antedon sp.*
- *Antho dichotoma*
- *cf. Antho sp.*
- *cf. Aplidium glabrum*
- *cf. Aplidium sp.*
- *Aplysilla sulfurea*
- *cf. Ascidacea sp.*
- *cf. Ascidia*
- *Ascidia conchilega*
- *Ascidia mentula*
- *cf. Ascidia virginia*
- *Ascidiacea sp.*
- *Ascidiella scabra*
- *Asterias rubens*
- *Astropecten irregularis*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- *Bolocera tuedaie*
- *Bonellia viridis*
- Brachiopoda
- *Brosme brosmе*
- *Caberea ellisii*
- *Calliostoma zizyphinum*
- *Cancer pagurus*
- *Ceramaster granularis*
- *Ceremaster granularis*
- *Chaetaster longipes*
- *Chlamys islandica*
- *Clathria laevis*
- *cf. Clathria laevis*
- *Craniella zetlandica*
- *Craniella zetlandica*
- *Cyanea capillata*
- *Cyanea lamarckii*
- *cf. Demospongia*
- Encrusting bryozoa
- *Facelina bostoniensis*
- Gadoid
- *Gadus morhua*
- *Galathea dispersa*
- *Galathea sp.*
- *Geodia barretti*
- *Halecium halecinum*
- *Halecium muricatum*
- *Halichondria panicea*
- *cf. Haliclona sp.*
- *Haliclona urceolus*
- *Henricia sp.*
- *Hornera lichenoides*
- *Hydroides norvegica*
- *Hydroides norvegicus*
- *cf. Hydrozoa*
- *Hymedesmia jecusculum*
- *Hymedesmia paupertas*
- *Hymedesmia sp.*
- *Kirchenpaueria pinnata*
- *Lebbeus polaris*
- *Lithodes maja*
- *Mesothuria intestinalis*
- *Molva molva*
- *Munida rugosa*
- *Munida sarsi*
- *Munida sp.*
- *Mycale lingua*
- *Novocrania anomala*
- *Omalosecosa ramulosa*
- *cf. Ophiuroidea*
- *Pagurus pubescens*
- *Pagurus sp.*
- *Palmiskenea skenei*
- *cf. Parasmittina sp.*
- *cf. Parasmittina trispinosa*
- *Parastichopus tremulus*
- *Parazoanthus sp.*
- *Phakellia ventilabrum*
- *cf. Placostegus tridentatus*
- *Plagioecia patina*
- *cf. Pollachius sp.*

- *Pollachius virens*
- *Polycarpa pomaria*
- *Polymastia* sp.
- *Polyplumaria flabellata*
- *Pomatoceros* sp.
- *Pomatoceros triqueter*
- *Porania pulvillus*
- *Pseudamussium perlutrae*
- *Reteporella beaniana*
- *Sabella pavonina*
- *Sabella tube*
- cf. *Schizomavella linearis*
- *Sebastes viviparus*
- *Serpula vermicularis*
- *Sertularella gayi*
- *Sertularella rugosa*
- *Spirontocaris liljeborgii*
- *Stichastrella rosea*
- *Suberites ficus*
- *Terebratulina retusa*
- *Thuiaria articulata*
- *Triglops murrayi*
- *Trisopterus esmarkii*
- *Trisopterus minutus*
- *Urticina eques*

ROV 4							
Date	Surface start time	Bottom start time	End timeTime end	Latitude	Longitude	Initial depth	Bottom description
11/07/201	09:14	09:29	11:14	59° 14,121' N	4° 45,318' E	260	Rocks, mud, sand

IDENTIFIED TAXA

- cf. *Amphilectus lobata*
- Amphipoda
- *Antedon* sp.
- *Antho brattegardi*
- *Antho dichotoma*
- *Aplidium glabrum*
- *Aplidium* sp.
- cf. *Aplysilla* sp.
- *Aplysilla sulfurea*
- *Arctica islandica*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- *Bonellia viridis*
- *Caberea ellisii*
- *Ceramaster granularis*
- *Chaetaster longipes*
- *Chelonaplysilla* sp.
- *Chimaera monstrosa*
- cf. *Chone infundibuliformis*
- *Clathria laevis*
- *Colus gracilis*
- *Craniella zetlandica*
- *Crella pulvinar*
- *Crossaster papposus*
- *Cyanea capillata*
- *Diphasia alata*
- *Eualus gaimardii*
- *Exidmonea atlantica*
- *Filograna implexa*
- *Galathea* sp.
- *Geodia barretti*
- *Geodia macandrewii*
- *Gracilechinus acutus*
- *Gracilechinus esculentus*
- *Guancha lacunosa*
- *Halecium muricatum*
- *Halichondria bowerbanki*
- *Haliclona oculata*
- *Haliclona urceolus*
- *Hormathia digitata*
- *Hornera lichenoides*
- *Hydroides norvegica*
- cf. Hydrozoa
- *Hymedesmia coriacea*
- *Hymedesmia paupertas*
- *Hymedesmia* sp.
- *Lebbeus polaris*
- *Lissoclinum perforatum*
- *Lithodes maja*
- *Megabalanus tintinnabulum*

- *Meganyctiphanes norvegica*
- *Merluccius merluccius*
- *Mesothuria intestinalis*
- cf. *Micromesistius poutassou*
- *Munida sarsi*
- *Munida* sp.
- *Mycale lingua*
- *Mycale lingua*
- *Neptunea despecta*
- *Novocrania anomala*
- *Pagurus pubescens*
- *Pagurus* sp.
- *Palmiskenea skenei*
- *Pandalus borealis*
- *Pandalus montagui*
- *Parasmittina trispinosa*
- *Phakellia ventilabrum*
- *Plagioecia patina*
- *Polycarpa pomaria*
- *Polymastia penicillus*
- *Polymastia* sp.
- *Porania pulvillus*
- *Rajella lintea*
- *Reteporella beaniana*
- *Rossia* sp.
- *Sabella pavonina*
- *Sabella tube*
- *Schizomavella mamillata*
- *Serpula vermicularis*
- *Sertularella gayi*
- *Sertularella polyzonias*
- *Suberites carnosus*
- *Terebratulina retusa*
- *Thuiaria articulata*
- *Trisopterus esmarkii*

ROV 5							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
11/07/201	13:13	13:26	14:22	59° 11,456' N	4° 46,859' E	213	Sand, mud

IDENTIFIED TAXA

- *Aglantha digitale*
- *Asteronyx loveni*
- *Bolinopsis infundibulum*
- *Bolocera tuedaie*
- *Chimaera monstrosa*
- *Etmopterus spinax*
- *Eualus gaimardii*
- *Eualus* sp.
- *Euplokamis dunlapae*
- *Foraminifera*
- *Funiculina quadrangularis*
- Gadoid
- *Kophobelemnion stelliferum*
- *Lebbeus polaris*
- *Lycodes* cf. *gracilis*
- *Lycodes* sp.
- *Meganyctiphanes norvegica*
- *Merluccius merluccius*
- *Mesothuria intestinalis*
- *Micromesistius poutassou*
- *Munida sarsi*
- *Munida* sp.
- *Myxine glutinosa*
- *Parastichopus tremulus*
- *Pollachius virens*
- *Protoptilum carpenteri*
- *Raja clavata*
- *Spirontocaris liljeborgii*
- *Trisopterus esmarkii*
- *Virgularia mirabilis*

ROV 6							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
11/07/201	17:00	17:07	18:05	59° 13,885' N	4° 59,645' E	153	Rocks, mud, sand

## IDENTIFIED TAXA

- |                                       |                                    |
|---------------------------------------|------------------------------------|
| - <i>Antedon</i> sp.                  | - <i>Lissoclinum perforatum</i>    |
| - <i>Antho dichotoma</i>              | - <i>Lycodes gracilis</i>          |
| - <i>Aplidium</i> sp.                 | - <i>Microstomus kitt</i>          |
| - <i>Argentina sphyraena</i>          | - <i>Munida rugosa</i>             |
| - <i>Axinella infundibuliformis</i>   | - <i>Munida sarsi</i>              |
| - <i>Axinella infundibuliformis</i>   | - <i>Munida</i> sp.                |
| - <i>Axinella rugosa</i>              | - <i>Mycale lingua</i>             |
| - <i>Bolocera tuedaie</i>             | - <i>Novocrania anomala</i>        |
| - <i>Bonellia viridis</i>             | - <i>Ophiura albida</i>            |
| - <i>Caberea ellisii</i>              | - <i>Pagurus</i> sp.               |
| - <i>Ceramaster granularis</i>        | - <i>Pandalus borealis</i>         |
| - <i>Chaetaster longipes</i>          | - <i>Parastichopus tremulus</i>    |
| - <i>Chimaera monstrosa</i>           | - <i>Phakellia ventilabrum</i>     |
| - <i>Clathria laevis</i>              | - <i>Polymastia boletiformis</i>   |
| - <i>Craniella zetlandica</i>         | - <i>Reteporella beaniana</i>      |
| - <i>Crella pulvinar</i>              | - <i>Sabella pavonina</i>          |
| - <i>Gadus morhua</i>                 | - <i>Sabella tube</i>              |
| - <i>Galathea</i> sp.                 | - <i>Sepiola atlantica</i>         |
| - <i>Geodia barretti</i>              | - <i>Sertularella gayi</i>         |
| - <i>Geodia macandrewi</i>            | - <i>Sertularella polyzonias</i>   |
| - <i>Halecium muricatum</i>           | - <i>Spirontocaris liljeborgii</i> |
| - <i>Halichondria bowerbanki</i>      | - <i>Stenopleustes latipes</i>     |
| - <i>Haliclona urceolus</i>           | - <i>Stichastrella rosea</i>       |
| - <i>Hippoglossoides platessoides</i> | - <i>Suberites carnosus</i>        |
| - <i>Hornera lichenoides</i>          | - <i>Terebratulina retusa</i>      |
| - <i>Hydroides norvegica</i>          | - <i>Trisopterus esmarkii</i>      |
| - <i>Hymedesmia paupertas</i>         | - <i>Trisopterus minutus</i>       |
| - <i>Hymedesmia</i> sp.               | - <i>Virgularia mirabilis</i>      |
| - <i>Lebbeus polaris</i>              |                                    |

ROV 7							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
12/07/201	9:36	09:53	10:56	59° 33,761' N	5° 11,181' E	357	Sand, mud, burrowed mud

## IDENTIFIED TAXA

- |                                    |                                    |
|------------------------------------|------------------------------------|
| - <i>Actinostola callosa</i>       | - <i>Munida sarsi</i>              |
| - <i>Bolocera tuedaie</i>          | - <i>Munida</i> sp.                |
| - <i>Chimaera monstrosa</i>        | - <i>Myxine glutinosa</i>          |
| - <i>Etmopterus pusillus</i>       | - <i>Nanomia cara</i>              |
| - <i>Etmopterus spinax</i>         | - <i>Pandalus</i> sp.              |
| - <i>Funiculina quadrangularis</i> | - <i>Parastichopus tremulus</i>    |
| - <i>Galeus melastomus</i>         | - <i>Phakellia ventilabrum</i>     |
| - cf. <i>Jania rubens</i>          | - <i>Saccharina latissima</i>      |
| - <i>Laminaria digitata</i>        | - <i>Spirontocaris liljeborgii</i> |
| - <i>Lebbeus polaris</i>           | - <i>Trisopterus esmarkii</i>      |
| - <i>Lithodes maja</i>             | - <i>Virgularia mirabilis</i>      |

ROV 8							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
12/07/201	12:27	12:50	14:01	59° 34,633' N	5° 10,304' E	293	Rocks, mud, sand

## IDENTIFIED TAXA

- |                                   |                                    |
|-----------------------------------|------------------------------------|
| - <i>Antho dichotoma</i>          | - <i>Eualus gaimardii</i>          |
| - <i>Aplidium</i> sp.             | - <i>Flustra folicea</i>           |
| - <i>Aplysilla rosea</i>          | - <i>Foraminifera</i>              |
| - <i>Aplysilla sulfurea</i>       | - <i>Fucus serratus</i>            |
| - <i>Ascidia conchilega</i>       | - <i>Funiculina quadrangularis</i> |
| - <i>Ascidia</i> sp.              | - <i>Galathea</i> sp.              |
| - <i>Axinella rugosa</i>          | - <i>Galeus melastomus</i>         |
| - <i>Bolocera tuedaie</i>         | - <i>Guancha lacunosa</i>          |
| - <i>Bonellia viridis</i>         | - <i>Halcampoides</i> sp.          |
| - <i>Caberea ellisii</i>          | - cf. <i>Halopteris catharina</i>  |
| - Caridea                         | - <i>Hormathia digitata</i>        |
| - <i>Cerianthus membranaceus</i>  | - <i>Hydroides norvegica</i>       |
| - <i>Chaetaster longipes</i>      | - <i>Hymedesmia paupertas</i>      |
| - <i>Chimaera monstrosa</i>       | - <i>Hymedesmia</i> sp.            |
| - <i>Clathria laevis</i>          | - cf. <i>Jania rubens</i>          |
| - <i>Craniella zetlandica</i>     | - <i>Laminaria digitata</i>        |
| - <i>Crella pulvinar</i>          | - <i>Lithodes maja</i>             |
| - cf. <i>Desmarestia aculeata</i> | - <i>Lophius piscatorius</i>       |
| - <i>Etmopterus spinax</i>        | - <i>Meganyctiphanes norvegica</i> |

- *Mesothuria intestinalis*
- *Munida sarsi*
- *Munida* sp.
- *Mycale lingua*
- *Myxine glutinosa*
- *Nanomia cara*
- *Nephrops norvegicus*
- *Novocrania anomala*
- *Pandalus borealis*
- *Parastichopus tremulus*
- *Periphylla periphylla*
- *Phakellia ventilabrum*
- *Plagioecia patina*
- *Polycarpa pomaria*
- *Polymastia penicillus*
- *Sabella pavonina*
- *Sabella tube*
- *Saccharina latissima*
- *Serpula vermicularis*
- *Spirontacaris liljeborgii*
- *Stomphia coccinea*
- *Tomopteris* sp.
- *Trisopterus minutus*
- *Virgularia* sp.
- *Virgularia tuberculata*

GRAB 1			
Date	Latitude	Longitude	Bottom description
10/07/2017	59° 27, 586' N	4° 59, 941' E	Mud, sand

IDENTIFIED TAXA

- *Calocaris macandreae*
- *Dentalium* sp.
- *Nucula nucleus*
- *Pseudamussium peslutrae*
- cf. *Rhabdammina discrete*
- *Saccamina sphaerica*
- *Timoclea ovata*
- Unidentified worm

GRAB 2			
Date	Latitude Start	Longitude Start	Bottom description
11/07/2017	59° 11, 049' N	4° 56, 891' E	Mud, sand

IDENTIFIED TAXA

- *Abra alba*
- *Amphilepis norvegica*
- *Antalis* cf. *occidentalis*
- *Astarte elliptica*
- *Astrorhiza limicola*
- *Astrorhizidae*
- *Pseudamussium peslutrae*
- *Thyasira aequalis*

GRAB 3			
Date	Latitude Start	Longitude Start	Bottom description
11/07/2017	59° 14, 059' N	4° 59, 832' E	Mud, coarse sand

## IDENTIFIED TAXA

- |  |   |
|--|---|
| - <i>Abra alba</i>                       | - <i>Nucula</i> sp.                     |
| - <i>Aequiecten opercularis</i>          | - <i>Oenopota tenuicostata</i>          |
| - <i>Antalis</i> cf. <i>occidentalis</i> | - <i>Parvicardium pinnulatum</i>        |
| - <i>Antalis entalis</i>                 | - <i>Pseudamusium peslutrae</i>         |
| - <i>Antalis</i> sp.                     | - <i>Puncturella noachina</i>           |
| - <i>Aporrhais serresianus</i>           | - <i>Similipecten similis</i>           |
| - <i>Astarte elliptica</i>               | - <i>Striarca lactea</i>                |
| - <i>Brissopsis lyrifera</i>             | - <i>Thracia distorta</i>               |
| - <i>Delectopecten vitreus</i>           | - <i>Thyasira</i> sp.                   |
| - <i>Euspira catena</i>                  | - <i>Timoclea ovata</i>                 |
| - <i>Golfingia vulgaris</i>              |   |
| - <i>Lepta caeca</i>                     | - <i>Yoldiella</i> cf. <i>lenticula</i> |
| - <i>Mactra stultorum</i>                | - <i>Yoldiella</i> sp.                  |
| - <i>Modiolula phaseolina</i>            |   |
| - <i>Novocrania anomala</i>              |   |

GRAB 4			
Date	Latitude Start	Longitude Start	Bottom description
12/07/2017	59° 34, 655' N	5° 14, 437' E	Coarse sand, mud

## IDENTIFIED TAXA

- |  |                                    |
|--|------------------------------------|
| - <i>Abra alba</i>                       | - <i>Nucula nucleus</i>            |
| - <i>Antalis</i> cf. <i>occidentalis</i> | - <i>Nucula</i> sp.                |
| - <i>Antalis entails</i>                 | - <i>Nuculana pernula</i>          |
| - <i>Arctica islandica</i>               | - <i>Panomya norvegica</i>         |
| - <i>Astarte elliptica</i>               | - Polichaeta                       |
| - Bivalvia                               | - <i>Pseudamussium peslutrae</i>   |
| - Brachiopoda                            | - <i>Thyasira aequalis</i>         |
| - Demospongiae                           | - <i>Thyasira</i> sp.              |
| - <i>Limopsis minuta</i>                 | - <i>Yoldiella</i> cf. <i>nana</i> |
| - <i>Mactra stultorum</i>                | - <i>Yoldiella lucida</i>          |
| - <i>Munida sarsi</i>                    | - <i>Yoldiella philippiana</i>     |



GRAB 5			
Date	Latitude Start	Longitude Start	Bottom description
12/07/2017	59° 34,350' N	5° 10,541' E	Mud, sand

## IDENTIFIED TAXA

- *Abra alba*
- *Amphilepis norvegica*
- *Antalis cf. occidentalis*
- *Bivalvia*
- *Karnekania sulcata*
- *Nucula hanleyi*
- *Nucula nucleus*
- *Nucula sp.*
- *Nucula sulcata*
- *Patella pellucida*
- Polichaeta
- *Thyasira aequalis*
- *Thyasira sp.*
- *Virgularia tuberculata*
- *Yoldiella philippiana*

**b. Area 2: Norwegian trench - Skagerrak**

ROV 1							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
13/07/2016	09:12	09:28	10:34	58° 11,319' N	6° 30,683' E	398	Mud, sand, burrowed mud

## IDENTIFIED TAXA

- Algae
- *Asteronyx loveni*
- *Astropecten irregularis*
- *Bolocera tuedaie*
- *Cerianthus lloydi*
- *Crangon crangon*
- *Funiculina quadrangularis*
- *Geryon sp.*
- *Glyptocephalus cynoglossus*
- cf. *Gryphus vitreus*
- *Halipterus finmarchica*
- *Hippoglossoides platessoides*
- *Loligo vulgaris*
- *Lycenchelys sarsii*
- *Megabalanus tintinnabulum*
- *Meganyctiphanes norvegica*
- *Modiolus modiolus*
- *Molva molva*
- *Munida sp.*
- *Myxine glutinosa*
- *Nephrops norvegicus*
- *Ophiura albida*
- *Pandalus borealis*
- *Parastichopus tremulus*
- *Pollachius virens*
- *Protoptilum carpenteri*
- *Raja clavata*
- *Spirontocaris liljeborgii*
- *Trisopterus esmarkii*
- *Trisopterus sp.*

ROV 2							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
13/07/2017	12:17	12:37	13:50	58° 07,165' N	6° 28,757' E	317	Sand, mud, burrowed mud

## IDENTIFIED TAXA

- |                                     |                                    |
|-------------------------------------|------------------------------------|
| - <i>Antho dichotoma</i>            | - <i>Hymedesmia paupertas</i>      |
| - <i>Aplidium</i> sp.               | - <i>Isidella lofotensis</i>       |
| - <i>Aplysilla sulfurea</i>         | - <i>Kophobelemnon stelliferum</i> |
| - <i>Asteronyx loveni</i>           | - <i>Lophius piscatorius</i>       |
| - <i>Axinella infundibuliformis</i> | - <i>Lycenchelys sarsii</i>        |
| - <i>Axinella rugosa</i>            | - <i>Meganyctiphanes norvegica</i> |
| - <i>Beroe cucumis</i>              | - <i>Molva molva</i>               |
| - <i>Bolinopsis infundibulum</i>    | - <i>Munida sarsi</i>              |
| - <i>Bonellia viridis</i>           | - <i>Munida</i> sp.                |
| - <i>Chaetaster longipes</i>        | - <i>Mycale lingua</i>             |
| - <i>Chimaera monstrosa</i>         | - <i>Myxine glutinosa</i>          |
| - <i>Colus gracilis</i>             | - <i>Nephrops norvegicus</i>       |
| - <i>Crangon crangon</i>            | - <i>Ophiura albida</i>            |
| - <i>Craniella zetlandica</i>       | - <i>Pandalus borealis</i>         |
| - <i>Cyanea capillata</i>           | - <i>Parastichopus tremulus</i>    |
| - <i>Filgrana implexa</i>           | - <i>Phakellia ventilabrum</i>     |
| - <i>Filograna implexa</i>          | - <i>Polymastia</i> sp.            |
| - <i>Funiculina quadrangularis</i>  | - <i>Protoptilum carpenteri</i>    |
| - <i>Glyptocephalus cynoglossus</i> | - <i>Sebastes viviparus</i>        |
| - <i>Halecium muricatum</i>         | - <i>Sertularella gayi</i>         |
| - <i>Halipterus finmarchica</i>     | - <i>Stichastrella rosea</i>       |
| - <i>Hydroides</i> sp.              | - <i>Trisopterus esmarkii</i>      |

ROV 3							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
13/07/2017	16:02	16:09	17:12	58° 13,328' N	6° 31,514' E	65	Boulders, rocks, sand

## IDENTIFIED TAXA

- |                                     |                                  |
|-------------------------------------|----------------------------------|
| - <i>Acantholabrus palloni</i>      | - <i>Axinella rugosa</i>         |
| - <i>Alcyonium digitatum</i>        | - <i>Bolinopsis infundibulum</i> |
| - <i>Antho dichotoma</i>            | - <i>Bonellia viridis</i>        |
| - <i>Ascidia conchilega</i>         | - Brown alga                     |
| - <i>Axinella infundibuliformis</i> | - <i>Cancer pagurus</i>          |

- *Chaetaster longipes*
- *Craniella zetlandica*
- *Cream encrusting demospongia*
- *Crella pulvinar*
- *Filograna implexa*
- Gadoids
- *Geodia barretti*
- *Glyptocephalus cynoglossus*
- *Haliclona urceolus*
- Hydrozoa
- *Laminaria digitata*
- *Laminaria digitata*
- *Lithodes maja*
- *Lophius piscatorius*
- *Molva molva*
- *Munida rugosa*
- *Novocrania anomala*
- *Palmiskenea skenei*
- *Phakellia ventilabrum*
- *Pollachius pollachius*
- *Pollachius* sp.
- *Porania pulvillus*
- Red encrusting demospongia
- *Reteporella beaniana*
- *Sabella tube*
- *Sebastes viviparus*
- *Serpula vermicularis*
- *Spirobranchus* sp.
- Squid eggs
- *Stichastrella rosea*
- *Suberties carnosus*
- *Terebratulina retusa*
- *Terpios gelatinosa*
- *Trisopterus minutus*
- *Trisopterus* sp.
- *Tubularia indivisa*

ROV 4							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
13/07/2017	18:50	19:02	20:10	58° 08,579' N	6° 32,802' E	191	Sand, mud, burrowed mud

IDENTIFIED TAXA

- *Antho dichotoma*
- *Aplidium glabrum*
- *Aplysilla sulfurea*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- Black encrusting sponge/squirt
- *Bonellia viridis*
- *Caberea ellisii*
- *Callionymus maculatus*
- *Cellepora pumicosa*
- *Chimaera monstrosa*
- *Craniella zetlandica*
- *Enchelyopus cimbrius*
- *Filograna implexa*
- *Flustra foliacea*
- *Foraminifera*
- *Gadiculus* sp.
- *Gadus morhua*
- *Galathea* sp.
- *Galeus melastomus*
- *Glyptocephalus cynoglossus*
- *Haliclona urceolus*
- *Hippoglossoides platessoides*
- Hydrozoa
- *Hymedesmia jecusculum*
- *Hymedesmia* sp.
- *Lycodes gracilis*
- *Meganyctiphanes norvegica*
- *Microstomus kitt*
- *Munida sarsi*
- *Munida* sp.
- *Myxine glutinosa*
- *Novocrania anomala*
- *Omalosecosa ramulosa*
- *Pachycerianthus multiplicatus*
- *Pagurus* sp.
- *Pandalus borealis*
- *Parastichopus tremulus*
- *Phakellia ventilabrum*
- *Phycodryis rubens*
- *Placostegus tridentatus*
- *Plagioecia patina*

- *Porania pulvillus*
- *Reteporella beaniana*
- *Sabella tube*
- *Schizomavella mamillata*
- *Serpula vermicularis*
- *Sertularella gayi*
- *Sertularella polyzonias*
- *Spirobranchus* sp.
- *Spirontocaris liljeborgii*
- *Stichastrella rosea*
- *Trisopterus minutus*

ROV 5							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
14/07/2017	12:03	12:11	13:11	58° 01,051' N	6° 44,550' E	87	Sand, cobbles, rocks

## IDENTIFIED TAXON

- *Antho* sp.
- *Arctica islandica*
- *Ascidia conchilega*
- *Asterias rubens*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- *Bonellia viridis*
- *Bonnemaisonia asparagoides*
- *Buenia jeffreysii*
- *Callionymus maculatus*
- *Carcinus maenas*
- *Cladophora rupestris*
- *Cyanea capillata*
- *Dictyota dichotoma*
- *Encrusting bryozoan*
- *Eualus gaimardii*
- *Facelina bostoniensis*
- *Gadus morhua*
- *Galathea* sp.
- *Halecium halecinum*
- *Haliclona urceolus*
- *Halidrys siliquosa*
- *Hornera lichenoides*
- *Hyas* sp.
- *Hydroides norvegica*
- *Hymedesmia paupertas*
- *Merlangius merlangus*
- *Metridium senile*
- *Molva molva*
- *Munida* sp.
- *Omalosecosa ramulosa*
- *Ophiura albida*
- *Pagurus* sp.
- *Palmiskenea skenei*
- *Pandalus montagui*
- *Parasmittina trispinosa*
- *Phakellia ventilabrum*
- *Placostegus tridentatus*
- *Pomatoceros* sp.
- *Porania pulvillus*
- *Porella compressa*
- *Reteporella beaniana*
- *Sabella tube*
- *Schizomavella linearis*
- *Securiflustra securifrons*
- *Serpula vermicularis*
- *Sertularella polyzonias*
- *Sertularella rugosa*
- *Spirobranchus* sp.
- *Stichastrella rosea*
- *Suberites ficus*
- *Tubularia indivisa*
- *Urticina eques*

ROV 6							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
14/07/2017	14:00	14:20	15:26	58° 00,126' N	6° 41,841' E	380	Sand, mud, burrowed mud

## IDENTIFIED TAXA

- Amphipoda
- *Asteronyx loveni*
- *Astropecten irregularis*
- *Bolinopsis infundibulum*
- Brown alga
- *Chaceon affinis*
- *Chimaera monstrosa*
- *Etmopterus spinax*
- *Eualus gaimardii*
- *Funiculina quadrangularis*
- *Glyptocephalus cynoglossus*
- *Isidella lofotensis*
- *Kophobelemnon stelliferum*
- *Lumpenus lampraeformis*
- *Meganyctiphanes norvegica*
- *Molva molva*
- *Munida sarsi*
- *Myxine glutinosa*
- *Nephrops norvegicus*
- *Pandalus borealis*
- *Parastichopus tremulus*
- *Pollachius virens*
- *Protoptilum carpenteri*
- *Ptychodactis patula*
- *Raja clavata*
- *Spirontocaris liljeborgii*
- *Trisopterus minutus*

ROV 7							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
14/07/2017	18:32	19:13	20:30	57° 51,816' N	6° 37,657' E	380	Sand, mud, burrowed mud

## IDENTIFIED TAXA

- *Actinostola callosa*
- *Asteronyx loveni*
- *Astropecten irregularis*
- *Bathypolypus* sp.
- *Bolinopsis infundibulum*
- *Bougainvilla muscus*
- *Cerianthus lloydi*
- *Cerianthus membranaceus*
- *Chimaera monstrosa*
- *Coelorinchus caelorrhincus*
- *Crangon crangon*
- *Craniella zetlandica*
- Foraminifera
- *Funiculina quadrangularis*
- *Glyptocephalus cynoglossus*
- *Gracilechinus acutus*
- *Halipterus finmarchica*
- *Kophobelemnon stelliferum*
- *Munida sarsi*
- *Myxine glutinosa*
- *Pandalus borealis*
- *Parastichopus tremulus*
- *Pollachius virens*
- *Polycarpa pomaria*
- *Protoptilum carpenteri*
- *Scalpellum scalpellum*
- *Scaphander lignarius*
- cf. *Funiculina* sp.
- *Spirontocaris liljeborgii*
- *Trisopterus esmarkii*

- *Virgularia mirabilis*

ROV 8							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
15/07/2017	9:47	10:11	11:20	57° 51,047' N	7° 11,609' E	459	San, mud, burrowed mud

## IDENTIFIED TAXA

- *Abietinaria abietina*
- *Achelia echinata*
- *Aplidium glabrum*
- *Ascophyllum nodosum*
- *Astropecten irregularis*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- *Bathypolypus* sp.
- *Bolinopsis infundibulum*
- *Brosme brosmes*
- *Chimaera monstrosa*
- *Clathria laevis*
- *Colus gracilis*
- *Crangon crangon*
- *Craniella zetlandica*
- *Crella pulvinar*
- *Cyanea capillata*
- *Epimeria cornigera*
- *Filograna implexa*
- *Flustra foliacea*
- *Foraminifera*
- *Geodia barretti*
- *Glyptocephalus cynoglossus*
- *Gracilechinus acutus*
- *Gryphus vitreus*
- *Guancha lacunosa*
- *Haliclona oculata*
- *Haliclona urceolus*
- *Hippasteria phrygiana*
- *Hornera lichenoides*
- *Hydroides norvegicus*
- *Hymedesmia jecusculum*
- *Hymedesmia paupertas*
- *Hymedesmia* sp.
- *Lissoclinum perforatum*
- *Molva molva*
- *Munida sarsi*
- *Mycale lingua*
- *Myxine glutinosa*
- *Nemertesia antennina*
- *Neptunea despecta*
- *Ophiura albida*
- *Pagurus bernhardus*
- *Pandalus borealis*
- *Phakellia ventilabrum*
- *Polymastia* sp.
- *Porania* sp.
- *Protula tubularia*
- *Psolus squamatus*
- *Quasillina brevis*
- *Raja clavata*
- *Sabella tube*
- *Sarcodictyon roseum*
- *Scalpellum scalpellum*
- *Sertularella gayi*
- *Sertularella polyzonias*
- *Spirontocaris liljeborgii*
- *Suberites carnosus*
- *Terebratulina retusa*

ROV 9							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
15/07/2017	12:59	13:15	14:25	57° 55,475' N	7° 11,952' E	215	Sand, mud, burrowed mud

## IDENTIFIED TAXA

- *Abietinaria abietina*
- *Actinauge richardi*
- *Antho dichotoma*
- *Aplidium glabrum*
- *Aplysilla rosea*
- *Aplysilla sulfurea*
- *Argentina sphyraena*
- *Ascidia*
- *Ascidia conchilega*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- *Bolocera tuedaie*
- *Bonellia viridis*
- *Caberea ellisii*
- *Cadlina laevis*
- *Chaetaster longipes*
- *Chimaera monstrosa*
- *Ciocalypta penicillus*
- *Clathria laevis*
- *Craniella zetlandica*
- *Crella pulvinar*
- *Crisia denticulata*
- *Cyanea capillata*
- *Eualus gaimardii*
- *Filgrana implexa*
- *Filograna implexa*
- *Flustra foliacea*
- Foraminifera
- *Funiculina quadrangularis*
- *Gadiculus* sp.
- Gadoids
- *Gadus morhua*
- *Galathea* sp.
- *Geodia barretti*
- *Glyptocephalus cynoglossus*
- *Gryphus vitreus*
- *Halecium halecinum*
- *Halecium muricatum*
- *Haliclona oculata*
- *Haliclona urceolus*
- *Halopteris catharina*
- *Hornera lichenoides*
- *Hydroides norvegica*
- *Hymedesmia jecusculum*
- *Hymedesmia paupertas*
- *Hymedesmia* sp.
- *Iphimedia obesa*
- *Lebbeus polaris*
- *Lycodes gracilis*
- *Meganyctiphanes norvegica*
- *Molgula manhattensis*
- *Munida sarsi*
- *Munida* sp.
- *Mycale lingua*
- *Omalosecosa ramulosa*
- *Pagurus* sp.
- *Palmiskenea skenei*
- *Pandalus borealis*
- *Parastichopus tremulus*
- *Phakellia ventilabrum*
- *Polycarpa pomaria*
- *Polymastia* sp.
- *Polymastia* sp.
- *Porania pulvillus*
- *Protula tubularia*
- *Reteporella beaniana*
- *Rossia* sp.
- *Sabella tube*
- *Scalpellum scalpellum*
- *Sertularella gayi*
- *Spirontocaris liljeborgii*
- *Stichastrella rosea*
- *Suberites carnosus*
- *Terebratulina retusa*
- *Trisopterus* sp.

ROV 10							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
15/07/2017	18:58	19:15	20:10	57° 53,149' N	7° 21,147' E	411	Mud, sand, burrowed mud

## IDENTIFIED TAXA

- *Asteronyx loveni*
- *Astropecten irregularis*
- *Bolocera tuedaie*
- *Cerianthus membranaceus*
- *Crangon crangon*
- *Cyanea capillata*
- *Funiculina quadrangularis*
- *Glyptocephalus cynoglossus*
- *Gracilechinus acutus*
- cf. *Iphimedia obesa*
- *Kophobelemnon stelliferum*
- *Munida sarsi*
- *Myxine glutinosa*
- *Pandalus borealis*
- *Pollachius virens*
- cf. *Ptychodactis patula*
- *Raja clavata*
- *Spirontocaris liljeborgii*
- *Trisopterus esmarkii*

ROV 11							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
16/07/2017	09:01	09:08	10:10	57° 59,061' N	7° 32,960' E	68	Sand, mud, boulders

## IDENTIFIED TAXA

- *Acantholabrus palloni*
- Algae
- *Ascidia conchilega*
- *Asterias rubens*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- Brown alga
- *Buccinum undatum*
- *Caberea ellisii*
- *Callionymus maculatus*
- *Cancer pagurus*
- cf. *Astropecten sp.*
- *Chaetaster longipes*
- *Ctenolabrus rupestris*
- *Halecium beanii*
- *Haliclona urceolus*
- *Henricia sp.*
- *Hippoglossoides platessoides*
- Hydrozoa
- *Lumpenus lampretæformis*
- *Marthasterias glacialis*
- *Merlangius merlangus*
- *Microstomus kitt*
- *Munida rugosa*
- *Novocrania anomala*
- *Pagurus sp.*
- *Palmiskenea skenei*
- *Pennatula phosphorea*



- *Phakellia ventilabrum*
- *Porania pulvillus*
- *Porella compressa*
- *Reteporella beaniana*
- *Sabella* sp.
- Sepiida
- *Serpula vermicularis*
- *Stichastrella rosea*
- *Swiftia rosea*
- *Terebratulina retusa*
- *Thuiaria articulata*
- *Triglops murrayi*
- *Trisopterus esmarkii*
- *Urticina eques*
- *Virgularia mirabilis*

ROV 12							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
16/07/2017	12:25	12:35	13:38	57° 57,946' N	7° 35,237' E	123	Sand, mud, boulders

## IDENTIFIED TAXA

- *Antedon petasus*
- *Aplysilla sulfurea*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- *Bonnemaisonia asparagoides*
- *Brosme brosme*
- *Cancer pagurus*
- *Chaetaster longipes*
- *Clathria laevis*
- *Craniella zetlandica*
- *Cyanea* sp.
- *Desmarestia viridis*
- *Echinus esculentus*
- *Eualus pusiolus*
- *Eudendrium rameum*
- *Foraminifera*
- *Gadiculus* sp.
- *Gadus morhua*
- *Galathea* sp.
- *Geodia barretti*
- *Haliclona urceolus*
- *Hornera lichenoides*
- *Hyas* sp.
- *Hydroides norvegica*
- *Hymedesmia paupertas*
- *Laminaria digitata*
- *Lithodes maja*
- *Microstomus kitt*
- *Molva molva*
- *Munida sarsi*
- *Novocrania anomala*
- *Pagurus bernhardus*
- *Pagurus pubescens*
- *Pandalus montagui*
- cf. *Parasmittina trispinosa*
- *Parastichopus tremulus*
- *Phakellia ventilabrum*
- *Phrynorhombus norvegicus*
- *Placostegus tridentatus*
- *Porania pulvillus*
- *Saccharina latissima*
- Sepiida
- *Serpula vermicularis*
- *Stenopleustes latipes*
- *Stichastrella rosea*
- *Trisopterus esmarkii*

ROV 13							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
16/07/2017	15:29	15:40	16:43	58° 00,073' N	7° 43,155' E	146	Sand, mud, burrowed mud

## IDENTIFIED TAXA

- *Algae*
- *Asteronyx loveni*
- *Bolocera tuedaie*
- *Cyanea capillata*
- *Desmarestia viridis*
- *Etmopterus pusillus*
- Foraminifera
- *Funiculina quadrangularis*
- *Gadiculus* sp.
- *Gadus morhua*
- *Glyptocephalus cynoglossus*
- *Halipterus finmarchica*
- *Hippoglossoides platessoides*
- *Laminaria* sp.
- *Lycenchelys sarsii*
- *Lycodes* cf. *gracilis*
- *Microstomus kitt*
- *Myxine glutinosa*
- *Nephrops norvegicus*
- *Ophiodromus flexuosus*
- *Pachycerianthus multiplicatus*
- *Pandalus montagui*
- *Parastichopus tremulus*
- *Pennatula phosphorea*
- *Spirontocaris liljeborgii*
- *Trisopterus esmarkii*
- *Virgularia mirabilis*

ROV 14							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
17/07/2017	09:16	9:28	10:37	58° 00,645' N	7° 53,849' E	210	Sand, mud, burrowed mud

## IDENTIFIED TAXA

- *Asciella aspersa*
- *Asteronyx loveni*
- *Astropecten irregularis*
- *Enchelyopus cimbrius*
- *Epimeria cornigera*
- *Etmopterus spinax*
- *Funiculina quadrangularis*
- *Gadiculus* sp.
- *Gadus morhua*
- *Glyptocephalus cynoglossus*
- *Halipterus finmarchica*
- *Hippoglossoides platessoides*
- Hydrozoa
- *Lithodes maja*
- *Lumpenus lampretæformis*
- *Lycodes* cf. *gracilis*
- *Meganyctiphanes norvegica*
- *Merluccius merluccius*
- *Micromesistius poutassou*
- *Munida sarsi*
- *Myxine glutinosa*
- *Nephrops norvegicus*

- *Ophiura* sp.
- *Pandalus montagui*
- *Parastichopus tremulus*
- *Pollachius virens*
- cf. *Ptychodactis patula*
- *Syscenus infelix*
- *Trisopterus esmarkii*

ROV 15							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
17/07/2017	12:33	12:39	13:53	58° 02,043' N	7° 52,168' E	84	Sand, rocks, boulders, mud

## IDENTIFIED TAXA

- *Anarhichas lupus*
- *Aplysilla rosea*
- *Aplysilla sulfurea*
- *Ascidia conchilega*
- *Ascidia* sp.
- *Axinella infundibuliformis*
- *Axinella rugosa*
- *Bonellia viridis*
- *Callionymus maculatus*
- cf. *Aplidium* sp.
- *Chaetaster longipes*
- *Chaetopterus tube*
- *Clathria laevis*
- *Craniella zetlandica*
- *Echinus esculentus*
- *Eualus gaimardii*
- *Eudendrium rameum*
- *Filograna implexa*
- Foraminifera
- *Funiculina quadrangularis*
- *Galathea* sp.
- *Geodia barretti*
- *Halecium halecinum*
- *Halichondria bowerbanki*
- *Haliclona urceolus*
- *Henricia* sp.
- *Hornera lichenoides*
- *Hydroides norvegica*
- *Hydrozoa*
- *Hymedesmia paupertas*
- *Kirchenpaueria pinnata*
- *Kophobelemnion stelliferum*
- Labridae
- *Lycodes gracilis*
- *Mesothuria intestinalis*
- *Microstomus kitt*
- *Molva molva*
- *Munida rugosa*
- *Munida sarsi*
- *Munida* sp.
- *Nephrops norvegicus*
- *Novocrania anomala*
- Nudibranchia
- *Pagurus* sp.
- *Palmiskenea skenei*
- *Parastichopus tremulus*
- *Pennatula phosphorea*
- *Phakellia ventilabrum*
- *Placostegus tridentatus*
- *Pollachius pollachius*
- *Pollachius* sp.
- *Polymastia* sp.
- *Pomatoschistus* sp.
- *Porania pulvillus*
- *Protanthea simplex*
- *Reteporella beaniana*
- *Sabella pavonina*
- *Sabella tube*
- *Sebastes viviparus*
- *Serpula vermicularis*
- *Stichastrella rosea*
- *Synoicum pulmonaria*
- *Terebratulina retusa*
- *Trisopterus esmarkii*

- *Virgularia mirabilis*

ROV 16							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
17/07/2017	15:23	15:32	16:35	58° 03,229' N	7° 56,227' E	120	Mud, sand, burrowed mud, rocks

## IDENTIFIED SPECIES

- Algae
- *Aplysilla sulfurea*
- *Ascidia conchilega*
- *Ascidia virginea*
- *Axinella rugosa*
- *Bolocera tuedaie*
- *Chaetaster longipes*
- *Chaetopterus tube*
- *Craniella zetlandica*
- *Cyanea capillata*
- *Cyanea* sp.
- *Eualus gaimardii*
- *Foraminifera*
- *Funiculina quadrangularis*
- *Gadiculus* sp.
- Gadoid
- *Gadus morhua*
- *Galathea* sp.
- *Geodia barretti*
- *Glyptocephalus cynoglossus*
- *Henricia* sp.
- *Hippoglossoides platessoides*
- *Hornera lichenoides*
- Hydrozoa
- *Hymedesmia paupertas*
- *Mesothuria intestinalis*
- *Microstomus kitt*
- *Munida rugosa*
- *Munida* sp.
- *Mycale lingua*
- *Myxine glutinosa*
- *Novocrania anomala*
- *Ophiura albida*
- *Pagurus bernhardus*
- *Pagurus* sp.
- *Pandalus borealis*
- *Pandalus montagui*
- *Pennatula phosphorea*
- *Phakellia ventilabrum*
- *Phrynorhombus norvegicus*
- *Placostegus tridentatus*
- *Plagioecia patina*
- *Pollachius* sp.
- *Reteporella beaniana*
- *Sabella* sp.
- *Serpula vermicularis*
- *Stichastrella rosea*
- *Synoicum pulmonaria*
- *Terebratulina retusa*
- *Trisopterus esmarkii*
- *Trisopterus minutus*

ROV 17							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
18/07/2017	9:39	09:55	11:14	58° 03,413' N	8° 05,192' E	248	Mud, sand, rocks

## IDENTIFIED TAXA

- *Abietinaria abietina*
- *Antho dichotoma*
- *Aplysilla sulfurea*
- *Ascidia*
- *Ascidia conchilega*
- *Axinella infundibuliformis*
- *Axinella rugosa*
- *Bolocera tuedaie*
- *Brosme brosme*
- *Caberea ellisii*
- *Cancer pagurus*
- *Chaetaster longipes*
- *Chimaera monstrosa*
- *Chlamys* sp.
- *Clathria laevis*
- *Craniella zetlandica*
- *Desmarestia viridis*
- *Etmopterus spinax*
- *Eualus gaimardii*
- *Eualus* sp.
- *Eusergestes arcticus*
- *Filgrana implexa*
- *Filgrana implexa*
- *Flustra folicea*
- Foraminifera
- *Funiculina quadrangularis*
- *Gadus morhua*
- *Geodia barretti*
- *Gracilechinus acutus*
- *Halecium halecinum*
- *Halecium muricatum*
- *Haliclona urceolus*
- *Henricia* sp.
- *Hyas* sp.
- *Hymedesmia paupertas*
- *Hymedesmia* sp.
- Isopoda
- *Lithodes maja*
- *Meganyctiphanes norvegica*
- *Munida sarsi*
- *Novocrania anomala*
- *Ophiura albida*
- *Pagurus* sp.
- *Pandalus borealis*
- *Pandalus montagui*
- *Phakellia ventilabrum*
- *Placostegus tridentatus*
- *Pollachius* sp.
- *Pollachius virens*
- *Polycarpa pomaria*
- *Polymastia* sp.
- *Porania pulvillus*
- *Reteporella beaniana*
- *Rossia* sp.
- *Sabella tube*
- *Sebastes viviparus*
- *Serpula vermicularis*
- *Spirontocaris liljeborgii*
- *Spirontocaris liljeborgi*
- *Stichastrella rosea*
- *Terebratulina retusa*
- *Trisopterus esmarkii*
- *Urticina eques*

ROV 18							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
18/07/2017	12:08	12:25	13:28	58° 05,771' N	8° 03,263' E	255	Sand, mud, burrowed mud

IDENTIFIED TAXA

- *Bathypolypus* sp.
- *Bolocera tuedaie*
- *Chimaera montrosa*
- *Desmarestia aculeata*
- *Eualus gaimardii*
- *Funiculina quadrangularis*
- *Glyptocephalus cynoglossus*
- Green alga
- cf. *Halipterus finmarchica*
- *Lithodes maja*
- *Lycenchelys sarsii*
- *Lycodes* sp.
- *Meganyctiphanes norvegica*
- *Munida sarsi*
- *Myxine glutinosa*
- *Nephrops norvegicus*
- *Pandalus borealis*
- *Pandalus montagui*
- *Pandalus* sp.
- cf. *Ptychodactis patula*
- *Saccharina latissima*
- *Spirontocaris liljeborgii*
- *Trisopterus esmarkii*
- *Virgularia mirabilis*

ROV 19							
Date	Surface start time	Bottom start time	End time	Latitude	Longitude	Initial depth	Bottom description
18/07/2017	19:26	19:34	20:30	58° 05,498' N	8° 10,583' E	129	Mu, sand, burrowed mud, rocks

IDENTIFIED TAXA

- *Antedon petasus*
- *Aplysilla sulfurea*
- *Argentina sphyraena*
- *Ascidia*
- *Ascidia conchilega*
- *Axinella rugosa*
- *Bonellia viridis*
- *Chaetaster longipes*
- *Chimaera monstrosa*
- *Echinus esculentus*
- *Eudendrium rameum*
- *Pleuronectiformis*
- Foraminifera
- *Glyptocephalus cynoglossus*
- *Halichondria bowerbanki*
- *Hymedesmia paupertas*
- *Lebbeus polaris*
- *Lithodes maja*
- *Munida sarsi*
- *Myxine glutinosa*
- *Novocrania anomala*
- *Ophiura* sp.
- *Pagurus* sp.
- *Pandalus montagui*
- *Parastichopus tremulus*
- *Phakellia ventilabrum*
- *Phrynorhombus norvegicus*
- *Plagioecia patina*
- *Porania pulvillus*
- *Reteporella beanaina*

- *Rossia* sp.
- *Sabella* tube
- *Spirontocaris liljeborgii*
- *Stichastrella rosea*
- *Terebratulina retusa*
- *Trisopterus esmarkii*
- *Trisopterus* sp.
- *Trisopterus esmarkii*
- *Urticina eques*

GRAB 1			
Date	Latitude Start	Longitude Start	Bottom description
13/07/2017	58° 11,082' N	6° 30,510' E	Mud, sand

IDENTIFIED TAXA

- *Abra alba*
- *Amphilepis norvegica*
- *Antalis* cf. *occidentalis*
- *Antalis entalis*
- *Lagis koreni*
- *Nucula nitidosa*
- *Nucula* sp.
- Polichaeta
- *Yoldiella lucida*

GRAB 2			
Date	Latitude Start	Longitude Start	Bottom description
14/07/2017	57° 55,158' N	6° 44,138' E	Mud, sand

IDENTIFIED TAXA

- *Abra alba*
- *Amphilepis norvegica*
- *Ennucula tenuis*
- *Nucula* sp.
- Pennatulacea
- Polichaeta
- *Thyasira aequalis*
- *Thyasira sarsi*

GRAB 3			
Date	Latitude Start	Longitude Start	Bottom description
15/07/2017	57° 53,145' N	7° 21,150' E	Mud, sand

IDENTIFIED TAXA

- *Abra alba*
- *Amphilepis norvegica*

- *Antalis* sp.
- *Phascolosoma granulatum*
- Polichaeta
- Scaphopoda

GRAB 4			
Date	Latitude Start	Longitude Start	Bottom description
16/07/2017	57° 57,947' N	7° 35,239' E	Mud, coarse sand

IDENTIFIED TAXA

- *Antalis* cf. *occidentalis*
- *Antalis* *entails*
- *Antalis* sp.
- *Astarte crebricostata*
- *Astarte elliptica*
- *Astarte* sp.
- *Astarte sulcata*
- *Caecum* sp.
- *Chlamys islandica*
- *Emerginula fissura*
- *Euspira* cf. *montagui*
- *Hemithiris psittacea*
- *Heteranomia squamula*
- *lothia fulva*
- *Limatula gwyni*
- *Mimachlamys varia*
- *Modiolula phaseolina*
- *Nucula nitidosa*
- *Nucula nucleus*
- *Nucula* sp.
- *Nucula sulcata*
- *Nuculana minuta*
- *Nuculana pernula*
- Nuculidae
- *Oenopota assimilis*
- *Owenia fusiformis*
- *Palliolum striatum*
- *Panomya norvegica*
- *Parvicardium papillosum*
- *Pseudamussium peslutrae*
- *Puncturella noachina*
- *Timoclea ovata*
- *Turritella communis*
- Unidentified Bivalvia
- Unidentified polichaetes
- *Yoldiella* sp.

GRAB 5			
Date	Latitude Start	Longitude Start	Bottom description
16/07/2017	58° 02,008' N	7° 42,897' E	Mud, sand

IDENTIFIED TAXA

- *Abra prismatica*
- *Corbula gibba*
- cf. *Nucula nitidosa*
- *Polichaeta*



- *Thyasira aequalis*
- *Thyasira gouldi*
- *Thyasira* sp.

GRAB 6			
Date	Latitude Start	Longitude Start	Bottom description
17/07/2017	58° 01,941' N	7° 52,199' E	Coarse sand, mud

IDENTIFIED SPECIES

- *Amphiura chiajei*
- *Astarte elliptica*
- *Astarte sulcata*
- *Nucula* sp.
- *Polichaeta*
- *Pseudamussium peslutrae*
- *Sphenia binghami*
- *Thyasira biplicata*
- *Timoclea ovata*

GRAB 7			
Date	Latitude Start	Longitude Start	Bottom description
17/07/2017	58° 03,059' N	7° 56,043' E	Coarse sand, mud

IDENTIFIED TAXA

- *Abra nitida*
- *Antalis* cf. *occidentale*
- *Astarte elliptica*
- *Astarte crebricostata*
- *Astarte* sp.
- *Astarte sulcata*
- *Ennucula tenuis*
- *Lepeta caeca*
- *Novocrania anomala*
- *Nucula nucleus*
- *Nucula* sp.
- *Nucula timidosa*
- *Nuculana minuta*
- Patellogastropoda
- Polichaeta
- *Pseudamussium peslutrae*
- *Puncturella noachina*
- *Timoclea ovata*
- *Turritella communis*
- Unidentified bivalvia
- *Yoldiella philippiana*

GRAB 8			
Date	Latitude Start	Longitude Start	Bottom description
17/07/2017	58° 02,586' N	7° 58,708' E	Coarse sand, mud

IDENTIFIED TAXA

- *Amphiura chiajei*
- *Anomia ephippium*
- *Antalis* cf. *occidentale*
- *Astarte elliptica*

- *Astarte monatgui*
- *Astarte* sp.
- *Astarte sulcata*
- *Balanus balanus*
- *Bela* sp.
- *Chamaelea striatula*
- *Emarginula fissure*
- *Euspira montagui*
- *Harmothoe imbricata*
- *Limatula gwyni*
- *Novocrania anomala*
- *Nucula* sp.
- *Nucula sulcata*
- *Panomya norvegica*
- *Parvicardium pinnulatum*
- Polichaeta
- Psammobiidae
- *Pseudamussiu peslutrae*
- *Puncturella noachina*
- *Retusa obtusa*
- *Timoclea ovata*
- *Turritella communis*

GRAB 9			
Date	Latitude Start	Longitude Start	Bottom description
18/07/2017	58° 05,931' N	8° 03,011' E	Mus, sand

IDENTIFIED SPECIES

- *Abra nitida*
- *Antalis cf. occidentale*
- *Antalis entalis*
- *Calocarides coronata*
- *Corbula gibba*
- *Lagis koreni*
- *Mytilus edulis*
- *Nucula nitidosa*
- *Nucula* sp.
- *Nuculana minuta*
- *Nuculana pernula*
- *Nuculidae*
- *Parvicardium minimum*
- Polichaeta
- *Pseudamussium peslutrae*
- *Thyasira aequalis*
- *Thyasira flexuosa*
- *Thyasira sarsi*
- *Thyasira* sp.
- *Unciola* sp.
- *Yoldella* sp.
- *Yoldiella philippiana*

GRAB 10			
Date	Latitude Start	Longitude Start	Bottom description
18/07/2017	57° 58,277' N	8° 15,808' E	Mud, sand

IDENTIFIED SPECIES

- *Abra nitidosa*
- *Amphilepis norvegica*
- *Thyasira aequalis*
- *Thyasira flexuosa*
- *Thyasira obsoleta*
- *Thyasira* sp.
- Unidentified polichaetes
- *Yoldiella philippiana*

ANNEX – PHOTOS TAKEN IN NORWEGIAN WATERS



*Microstomus kitt*



*Labrus mixtus*



*Homarus gammarus*



*Henricia oculata*



*Cyanea capillata*



*Larus marinus*



*Laminaria sp.*



*Caryophyllia smithii*



*Crossaster papposus*



*Doris pseudoargus*



*Tonicella rubra*



*Clavelina lepadiformis*



*Trisopterus minutus*



*Aporrhais pespelecani*



*Dendronotus frondosus*