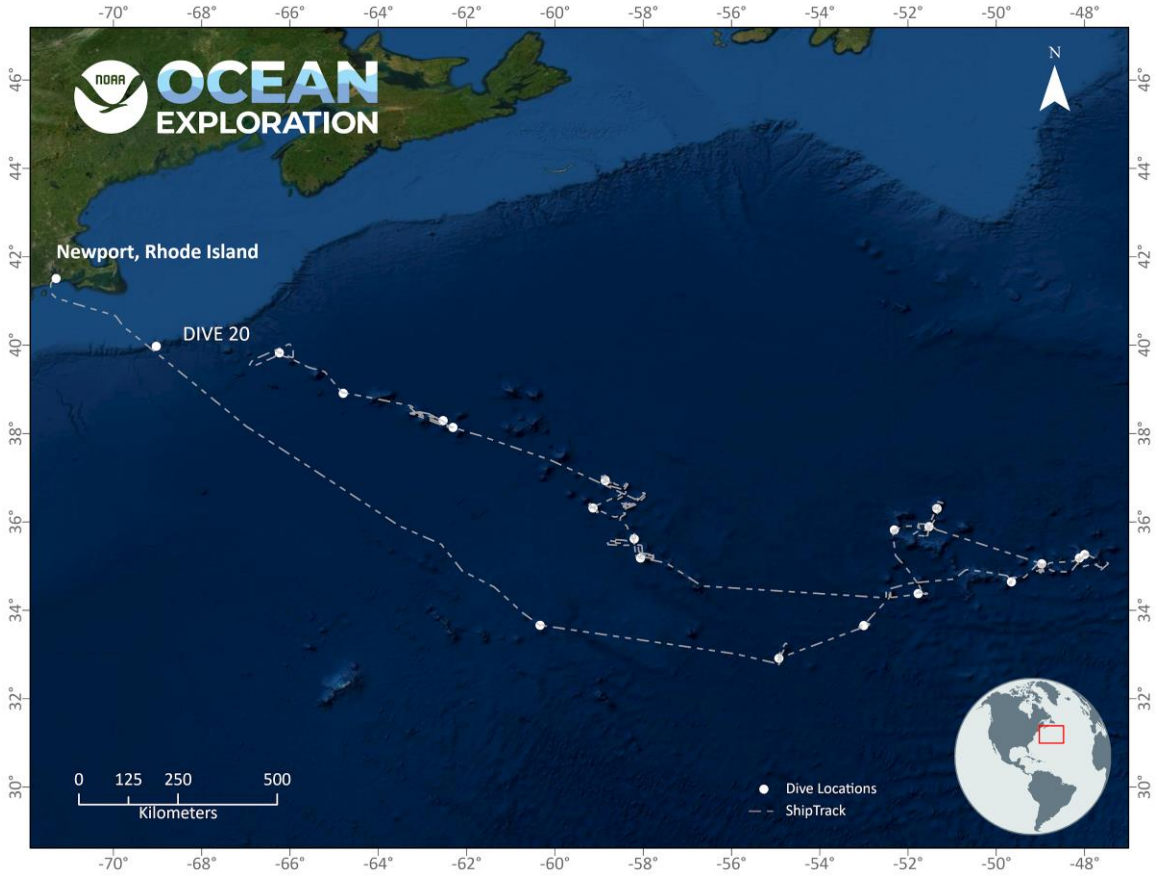
ROV Dive Summary, EX-21-04, Dive 20, July 28, 2021

General Location Map



Dive Information

Site Name	Hydrographer Canyon
General Area Descriptor	Canyon on the northeastern shelf edge of the U.S.
Science Team Leads	Michael Vecchione, Adrienne Copeland, Rhian Waller, Jason Chaytor, Kira Mizell
Expedition Coordinator	Kasey Cantwell, Kimberly Galvez (Expedition Coordinator in Training)
ROV Dive Supervisor	Chris Ritter
Mapping Lead	Shannon Hoy

Dive Purpose	Explore the water column in Hydrographer Canyon
Was the dive restricted for Underwater Cultural Heritage?	No
ROV Dive Summary Data	Dive Summary: EX2104_DIVE20 ^^ Dive Type: MID WATER ONLY DIVE In Water: 2021-07-28T12:52:02.156669 39.98367283940506 ; -69.0096625696786 On Bottom: N/A N/A ; N/A Off Bottom: N/A N/A ; N/A Out Water: 2021-07-28T19:35:43.963187 39.98772383632304 ; -69.01026576500736 Dive Duration: 6:43:41 Bottom Time: N/A Max Vehicle Depth: N/A m Min Seafloor Depth: N/A m Distance Travelled: N/A m Mid Water Transects Summary ^^ Number of Transects: 6 Transect 1 Start: 13:39:30 39.98230654679469 ; -69.01061193349335 End: 13:54:31 39.98269914469959 ; -69.01144184885186 Duration: 0:15:0 Depth: 300.0 m Transect 2 Start: 14:19:00 39.98271157894722 ; -69.01168863157893 End: 14:39:03 39.98282339123259 ; -69.01167729578135 Duration: 0:20:3 Depth: 501.0 m

	Transect 3 Start: 14:56:15 39.982867219385184 ; -69.01146035650092 End: 15:16:16 39.98281572349932 ; -69.0115061912517 Duration: 0:20:1 Depth: 700.0 m Transect 4 Start: 15:31:45 39.982831506632856 ; -69.01149749336714 End: 15:56:45 39.98282595019238 ; -69.01146410506065 Duration: 0:25:0 Depth: 899.0 m Transect 5 Start: 16:16:45 39.98286087355976 ; -69.01150581610061 End: 17:34:35 39.98396721448135 ; -69.01089196242722 Duration: 1:17:50 Depth: 1195.0 m Transect 6 Start: 17:55:03 39.98445506092578 ; -69.01034414216016 End: 19:09:06 39.9842579908608 ; -69.01074108465625 Duration: 1:14:3 Depth: 630.0 m

Dive Description

The final dive of the EX2104 North Atlantic Stepping Stones Expedition was a full day mid-water dive within Hydrographer Canyon. Previously only multibeam bathymetry has been carried out in this region. The dive start time was delayed by 30 minutes due to the current so the pre-dive brief started at 9:00 am EDT with the first transect at 300 m starting at 13:39:30 UTC. The descending depth transects included four standard transects from 300, 500, 700, 900 m and two variable transects at 1200 and 630 m. The variable transects were picked based on the interest in sampling the bathypelagic and the highest intensity backscatter within the DSL, respectively. The 300 m took 15 minutes, the 500 and 700 m took 20 minutes, and the 900 m took 25 minutes. The two variability transects at 1200 m and 630 m took 70 and 74 min, respectively.

We saw a total of more than 650 individuals throughout the water column transects. This included annelida, arthropoda, cercozoa, chaetognatha, chordata, cnidaria, ctenophora, mollusca, ochrophyta, and radiozoa. See table 1 for more details about the organisms seen throughout the transects. Throughout the dive, there were more *Bathocyroe fosteri* (lobate ctenophores) seen than any other organism. There were also high amounts of marine snow, amphipods, copepods, and other crustaceans seen throughout every transect of the dive. Five collections were made during the dive.

During the 700 m transect, there was an undescribed species of poralia. We also tried to sample an *Aeginura grimaldii* but it moved out of reach too quickly. Towards the end of the 700 m transect, we saw a juvenile Macrouridae (rattail). During the 900 m transect, we collected a physonectae (siphonophorae), a bathocyroe (ctenophora), and a solmissus (cnidaria). During the 1200 m transect, there was an undescribed family and new species in the order cydippida at 16:19:30 UTC and shortly after there was an undescribed jellyfish documented at 17:11:57 UTC and was collected. Another organism collected was a trachymedusae (cnidaria). Also during the 1200 m transect there was an amphipod on top of a ctenophora. During the final 630 m transect, there were many squids quickly jetting into the camera and one released squid ink. They were most likely the northern shortfin squid but were hard to identify based on the speed that they entered and left the camera view. At this depth, we also saw dragonfish, a potential undescribed species of siphonophore, and a snipe eel with a species of caridean shrimp in its mouth which seems to be a new prey item. The ROV recovery started at 19:10:30 UTC following the 630 m transect.

Table 1. Number of organisms in each phylum entered into SeaTube V3 during the transects. This table does not include the individuals that were not entered into WORMS and might include duplication or missing IDs.

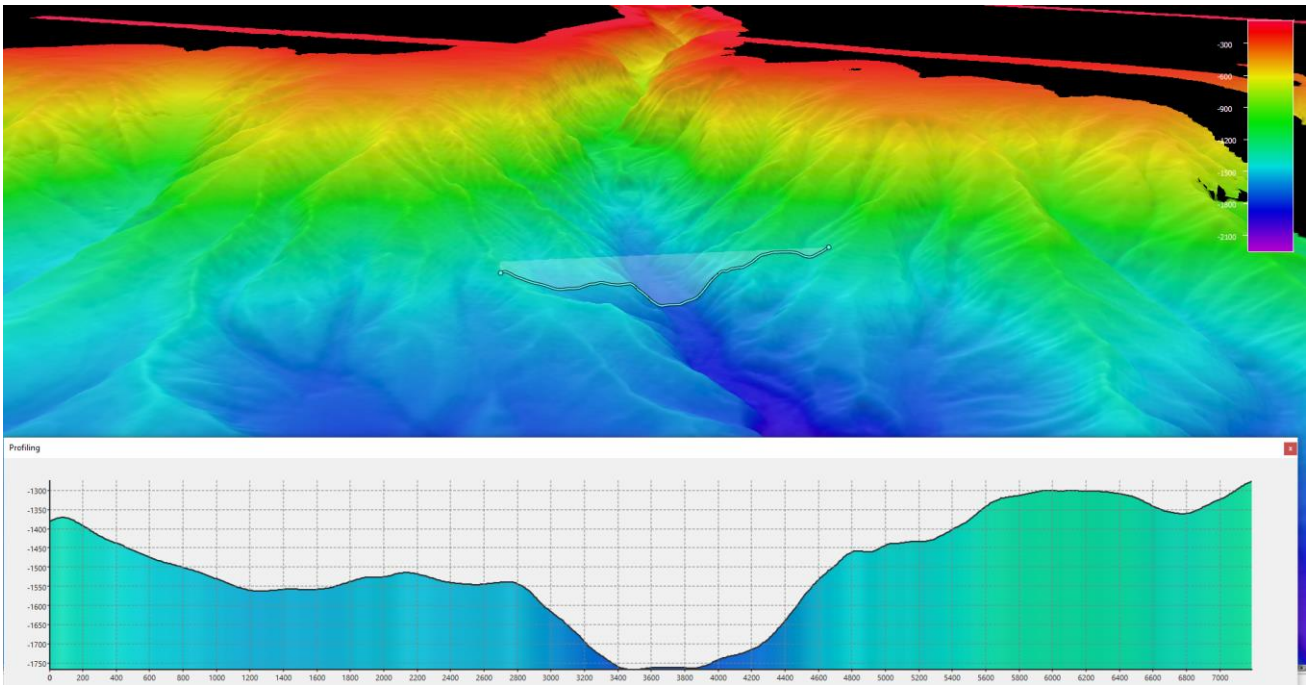
Depth (m)	Annelida	Arthropoda	Cercozoa	Chaetognatha	Chordata	Cnidaria	Ctenophora	Mollusca	Ochrophyta	Radio
300	0	4	0	1	2	0	3	0	0	3
500	0	4	0	5	6	19	17	0	3	0
700	0	8	0	0	9	18	13	0	1	0
900	0	4	0	1	8	11	8	1	0	0
1200	1	19	0	12	19	22	18	0	0	0
630	0	17	1	3	18	50	59	17	0	0

Notable Observations	We saw a total of more than 650 individuals throughout the water column transects. This included annelida, arthropoda, cercozoa, chaetognatha, chordata, cnidaria, ctenophora, mollusca, ochrophyta, and radiozoa.
Community and habitat observations	Corals and Sponges - (Absent) Chemosynthetic Community - (Absent) High biodiversity Community - (Absent) Active Seep or Vent - (Absent) Extinct Seep or Vent - (Absent) Hydrates - (Absent)
CMECS Feature Type(s)	N/A
SeaTube Link (science annotation system)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=2433

Equipment Deployed

ROV	*Deep Discoverer*
Camera Platform	*Seirios*
ROV Measurements	The following ROV measurements, data streams and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution cameras, low resolution cameras, manipulator arms, suction sampler, sample drawers and thrusters. The section below notes if any of these sensors were malfunctioning or not operational
Equipment Malfunctions	The salinity sensor on *Seirios* is still showing bad data.

Close-up Map of Main Dive Site

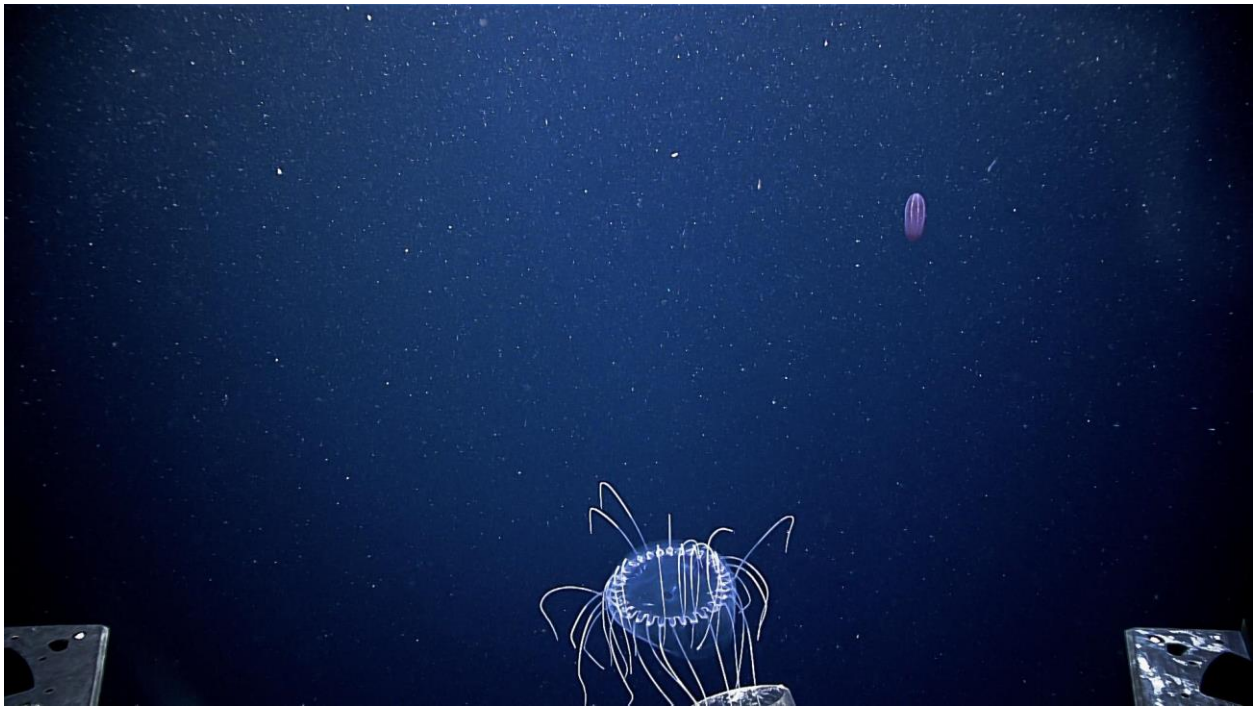


Profile of Hydrographer Canyon (blue line) on 25x25 cell size bathymetry, 3x vertical exaggeration, depth in meters. Profile of blue line underneath bathymetry.

Representative Photos of the Dive

One of many *Bathocyroe fosteri* seen throughout every transect sampled during the water column exploration. One of these was collected for type ID.

Potential undescribed species of Poralia during the 700 m transect.



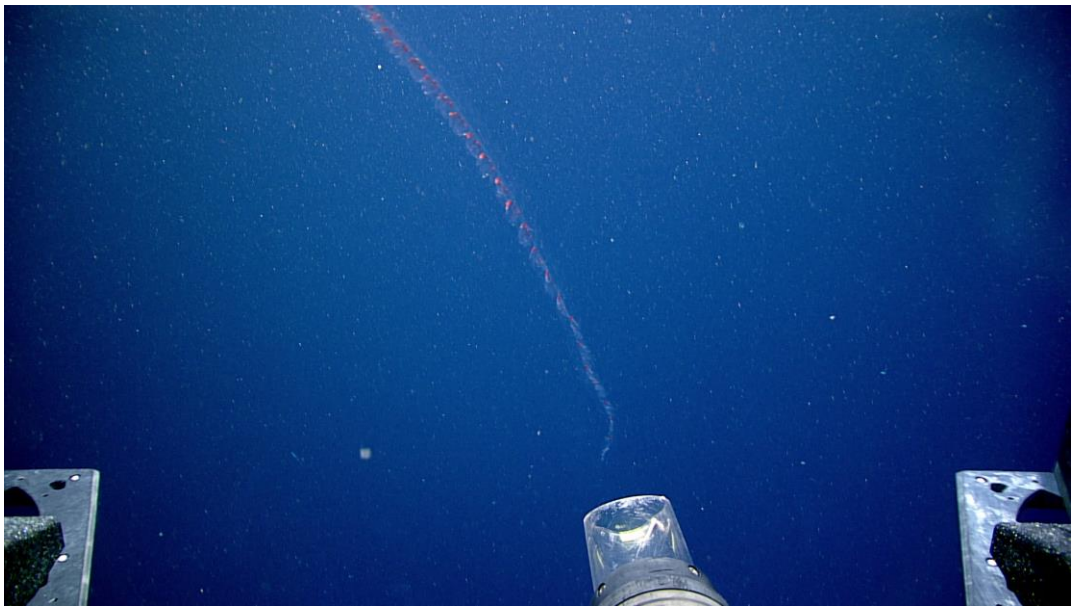
Suction sampling a Solmissus, the dinner plate jellyfish. Behind the Solmissus, there is a Beroe. Many beroes were seen throughout the dive.

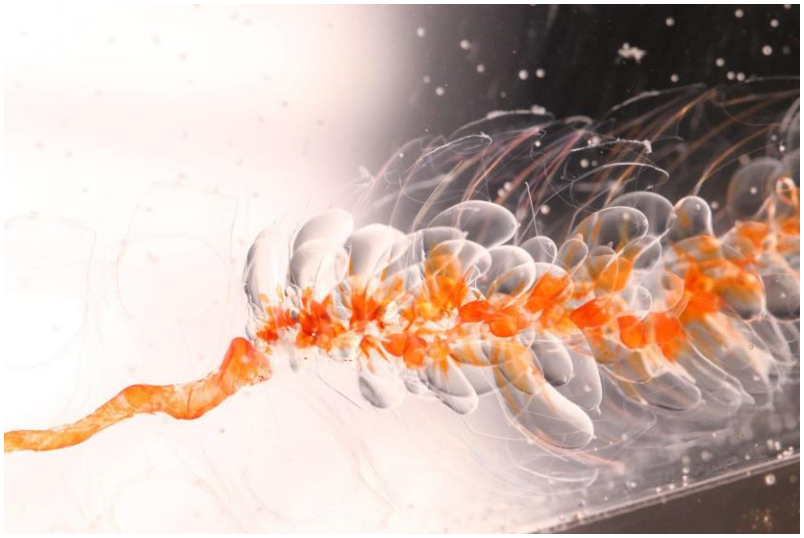
Snipe eel with caridean shrimp in its mouth seen during the 630 meter transect. These were thought to only eat sergestid shrimp.

Potentially undescribed species of siphonophore during the final transect at 630 m at 18:54:33 UTC.

Unknown gelatinous organism sampled at the 1200 meter transect. (EX2104_IMG_20210728T171148Z_ROVHD)

Samples Collected -



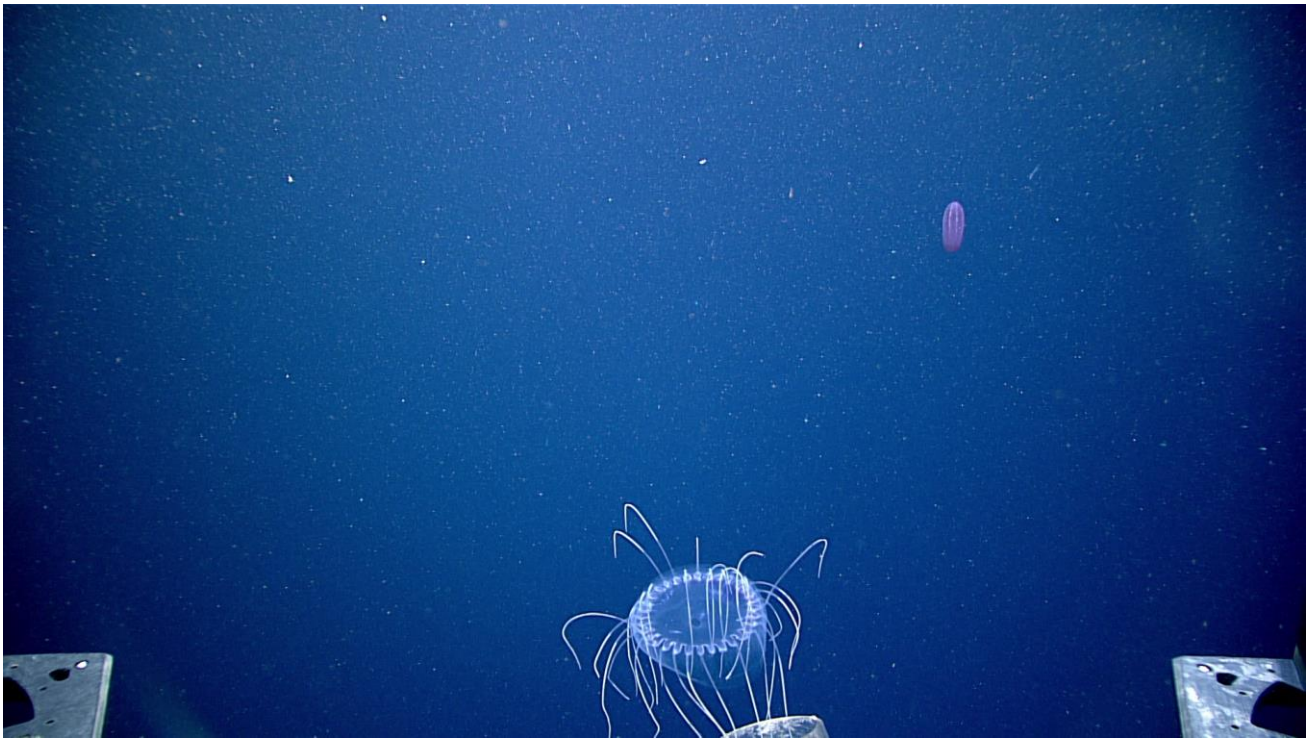


Sample ID	EX2104_D20_01B
Date (UTC)	20210728
Time (UTC)	154141
Depth (m)	894.1569824
Latitude (decimal degrees)	39.98271561
Longitude (decimal degrees)	-69.01176453
Temp. (°C)	4.610000134
Field ID(s)	Physonect Siphonophore
Comments	~15cm.

Associates Sample ID	Field Identification	Count
N/A	N/A	N/A

Sample ID	EX2104_D20_02B
Date (UTC)	
Time (UTC)	
Depth (m)	
Latitude (decimal degrees)	
Longitude (decimal degrees)	
Temp. (°C)	
Field ID(s)	
Comments	**Sample Absent Upon ROV Recovery**

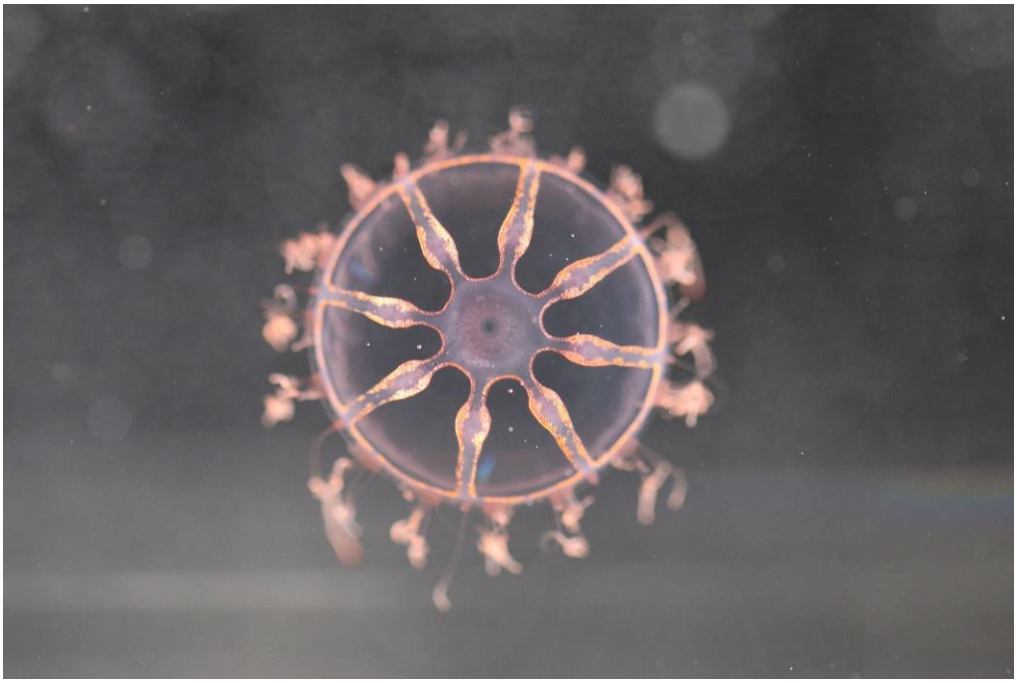
Associates Sample ID	Field Identification	Count
N/A	N/A	N/A



Sample ID	EX2104_D20_03B
Date (UTC)	20210728
Time (UTC)	155210
Depth (m)	903.1099854
Latitude (decimal degrees)	39.98272324

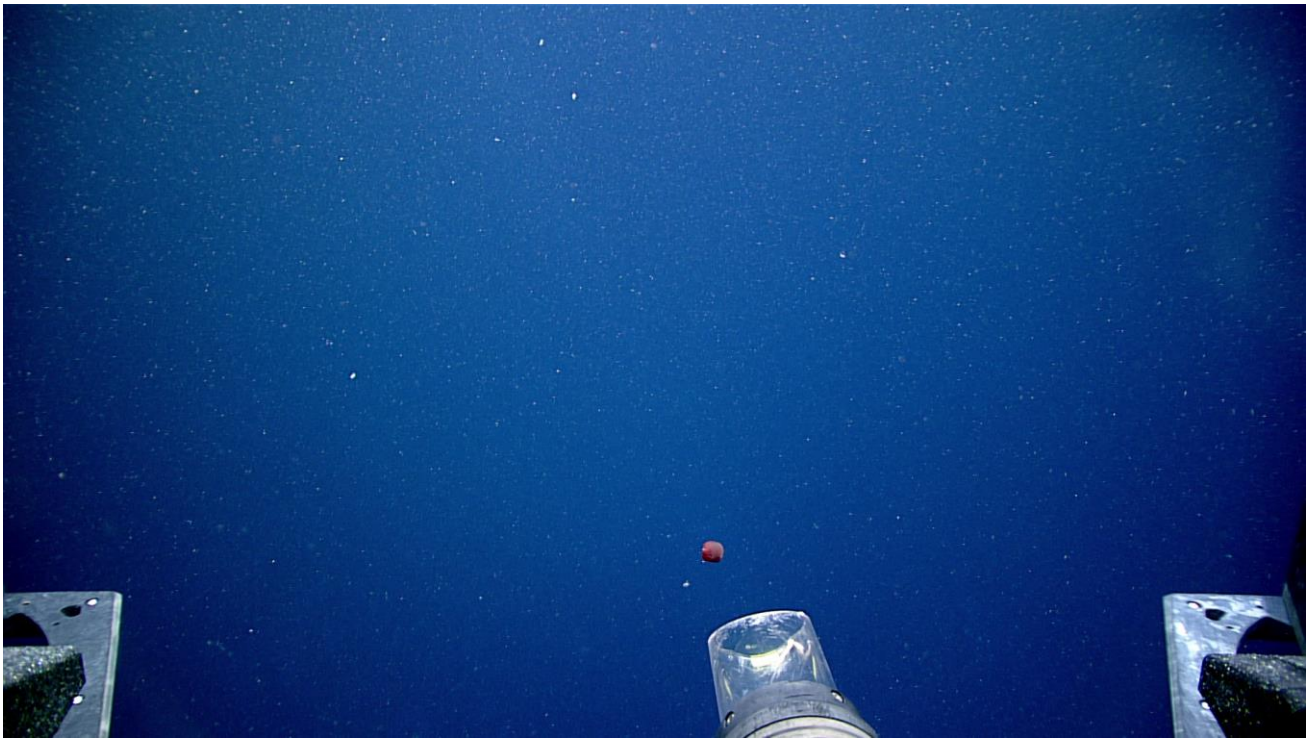
Longitude (decimal degrees)	-69.01143646
Temp. (°C)	4.598999977
Field ID(s)	Solmissus
Comments	purple tint. ~10cm. Main body is torn into two pieces.

Associates Sample ID	Field Identification	Count
N/A	N/A	N/A



Sample ID	EX2104_D20_04B
Date (UTC)	20210728
Time (UTC)	163448
Depth (m)	1201.624023
Latitude (decimal degrees)	39.98317337
Longitude (decimal degrees)	-69.01123047
Temp. (°C)	4.43900013
Field ID(s)	Botrynema brucei
Comments	<2cm. Got DNA sample but no tentacle subsamples.

Associates Sample ID	Field Identification	Count
N/A	N/A	N/A



Sample ID	EX2104_D20_05B
Date (UTC)	20210728

Time (UTC)	171244
Depth (m)	1200.842041
Latitude (decimal degrees)	39.98417664
Longitude (decimal degrees)	-69.01075745
Temp. (°C)	4.440999985
Field ID(s)	Unknown Jelly
Comments	3cm. ROV made it look pink, in wetlab is red. Small bell shaped.

Associates Sample ID	Field Identification	Count
N/A	N/A	N/A

Scientists Involved (provide name, email, affiliation)

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