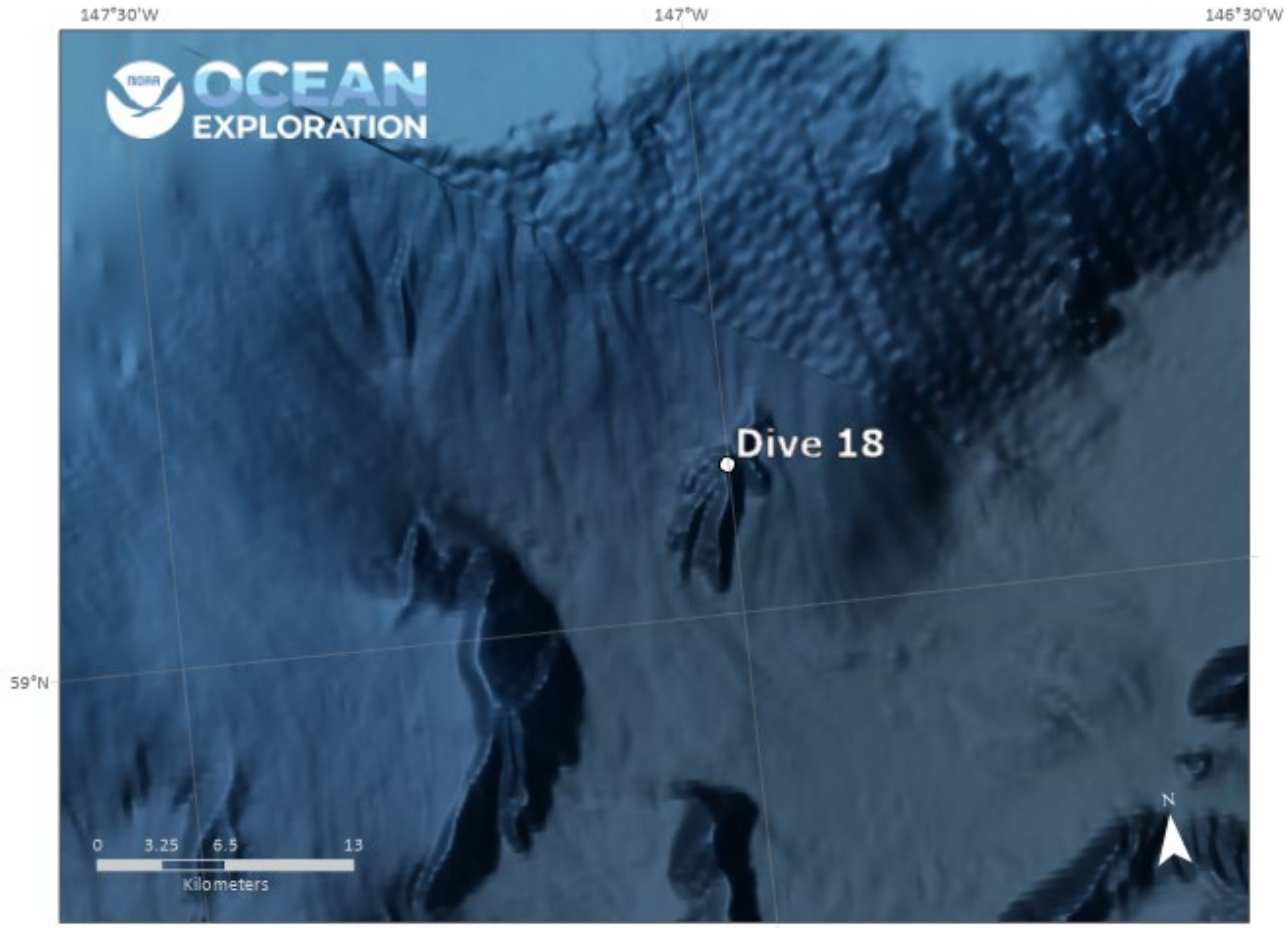
ROV Dive Summary
EX2306, Dive 18, September 12, 2023

General Location Map



Dive Information

Site Name	Gumby Ridge
General Area Descriptor	Gulf of Alaska
Science Team Leads	Merlin Best (Bio); Jamie Conrad (Geo)
Expedition Coordinator	Sam Candio
ROV Dive Supervisor	Lars Murphy
Dive Purpose	The dive site is an isolated ridge located on the mid-slope at depths of about 1650-1800 m on the Aleutian Subduction Zone, about 50 km southwest of Middleton Island. The ridge is one of many that lie on the middle and lower slope, inboard of the deformation front, that result from folding and faulting in the upper plate. Exploration of this ridge will provide information on the age and lithology of the sediments of the accretionary wedge, and the effects of severe shaking from large earthquakes. This is a geologic environment favorable for the formation of cold seeps, and may host active venting that would provide valuable information on subsurface fluid migration. Due to the target depth (>1000m), trawl and long line surveys have generally not reached this area, leaving a large data gap on the species that occur there. Diving on this site and documenting the fish species, habitat-forming species, associated fauna, and their relative abundances we see will aim to fill in this data gap to contribute to current fisheries research efforts in the Gulf of Alaska.
Maritime Heritage Restrictions	No

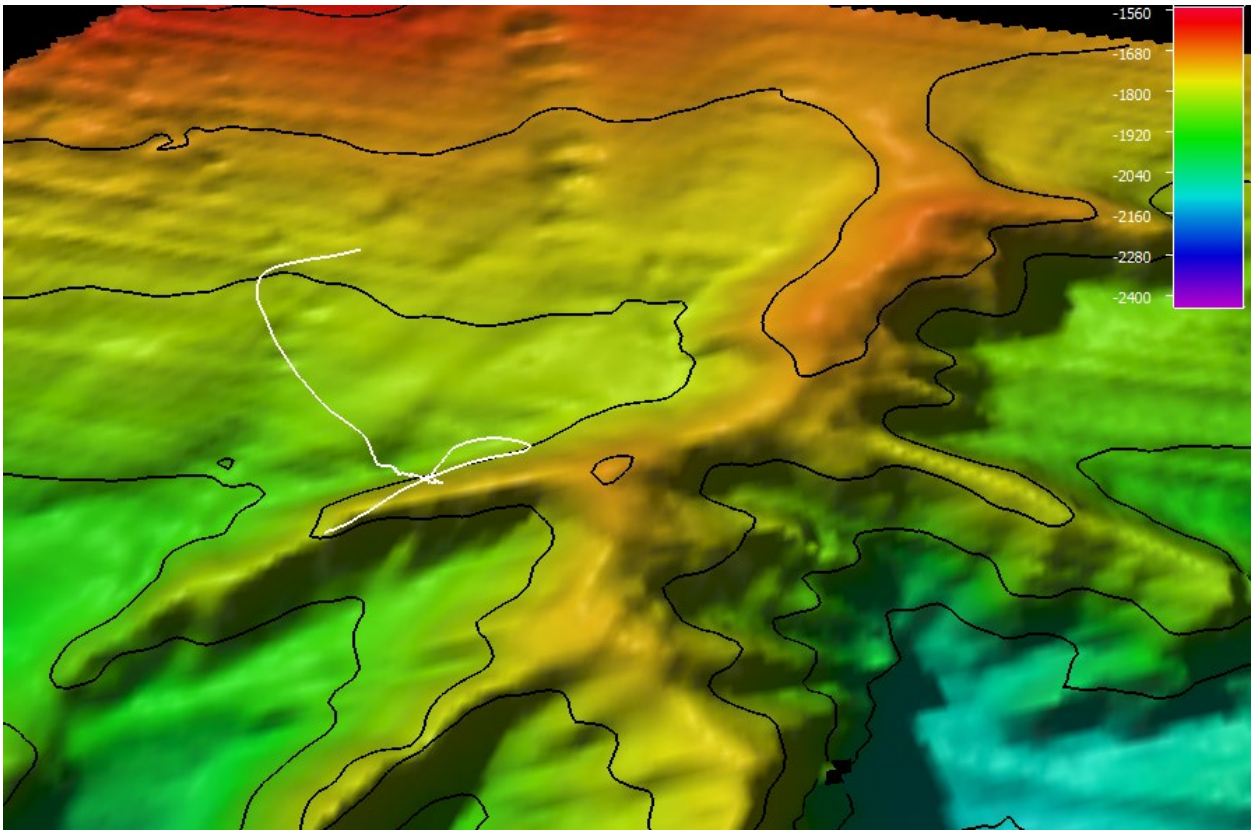
ROV Dive Summary Data	Dive Type: Normal In Water: 2023-09-12T17:39:50.189267 59.07789178660613 ; -147.01321962429057 On Bottom: 2023-09-12T18:55:24.405889 59.07471108373068 ; -147.01285920551211 Off Bottom: 2023-09-12T23:33:42.532529 59.072817130356704 ; -147.01135160056694 Out Water: 2023-09-13T00:35:35.067407 59.063789404412034 ; -147.01859954045864 Dive Duration: 6:55:44 Bottom Time: 4:38:18 Max Vehicle Depth: 1868.3 m Min Seafloor Depth: 1735.3 m Distance Traveled: 312.6 m

Dive Description	***Geology*** This dive on the eastern end of the Aleutian Subduction Zone was on a ridge rising above the slope at depths of about 1750-1850 m. Mostly shallow-dipping to nearly flat-lying sedimentary rocks were well exposed on this ridge with only a thin cover of fine sediment mantling the rocks in places, especially on flatter areas. Most of the outcrops appeared to be friable mudstone, but several vertical walls, some up to about 5-m-high provided excellent exposures of thin to thick beds of pebble to cobble conglomerates interbedded with finer-grained sandstone and mudstones, with numerous cut-and-fill channel structures, indicating these outcrops represent turbidites in a submarine fan complex. A few scattered, freshly fractured boulders were encountered on ledges that probably fell from the steeper walls. Overhangs on the steep walls were the preferred location of brooding octopus. One sample of clam-bored mudstone was collected. ***Biology*** The dive provided a glimpse of a very diverse and abundant ecosystem. We landed very close to a small field of sea pens (Balticina sp.), with associated Snake Stars (Asteronyx loveni), which we continued to see in increasing abundance on and off throughout the dive. As we ascended we saw diverse and abundant corals and sponges Keratoisididae, Paragorgia sp., several different species of Hexactinellida) attached to harder substrate, and close to twenty individual Deep-Sea Octopus (Graneledone boreopacifica) brooding over eggs. We also saw several juvenile Deep-Sea Octopus, making it the second observation of a successful nursery ground for this rare species and an incredibly active one.
Notable Observations	Abundant G. boreopacifica brooding and apparently at different stages in this process, as well as several juveniles.
Community and Habitat Observations	Corals and Sponges — Present Chemosynthetic Community — Absent High biodiversity Community — Present Active Seep or Vent — Absent Extinct Seep or Vent — Absent Hydrates — Absent
CMECS Feature Type(s)	Ledge Outcrop/Rock Outcrop Ridge Scarp/Wall Slope Submarine Slide Deposit Terrace
SeaTube Link (science annotations)	https://data.oceannetworks.ca/SeaTubeV3?resourceTypeId=600&resourceId=6820

Equipment Deployed

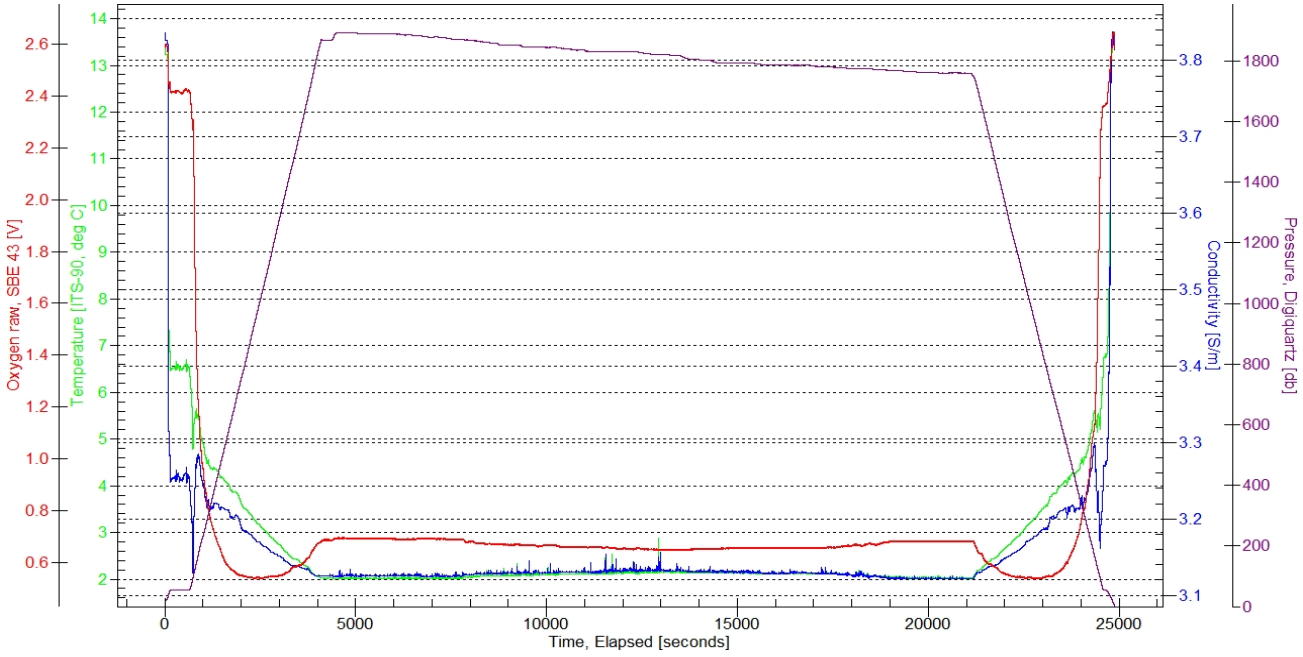
ROV	*Deep Discoverer*
Camera Platform	*Seirios*
ROV Measurements	The following ROV measurements, data streams and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution cameras, low resolution cameras, manipulator arms, suction sampler, sample drawers and thrusters. The following row notes if any of these sensors were malfunctioning or not operational
Equipment Malfunctions	None.

Close-Up Map of Main Dive Site



Smoothed ROV dive track in white on 25x25 cell size bathymetry, 1x vertical exaggeration, depth in meters, 100 meter contours.

Sound Speed Manager Image of ROV CTD Profile



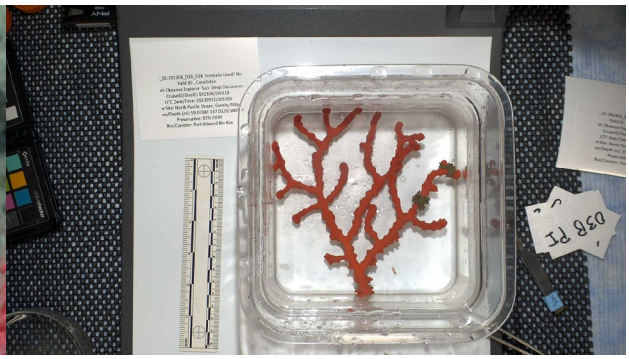
Plot of the ROV CTD profile, showing temperature, conductivity, pressure, and dissolved oxygen over time.

Representative Photos of the Dive

Top: a deep-sea octopus (Graneledone boreopacifica) brooding over eggs; Bottom: soft sediment with abundant fauna.

Samples Collected

Sample ID	EX2306_D18_02B
Date (UTC)	20230912
Time (UTC)	191331
Depth (m)	1865.06701660156
Latitude (decimal degrees)	59.0745506286621
Longitude (decimal degrees)	-147.012802124023
Temp. (°C)	2.01500010490417
Field ID(s)	Balticina

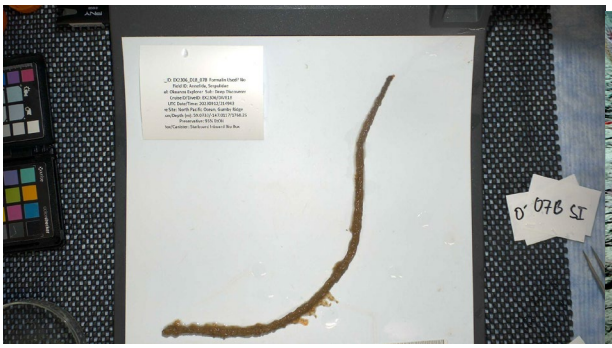


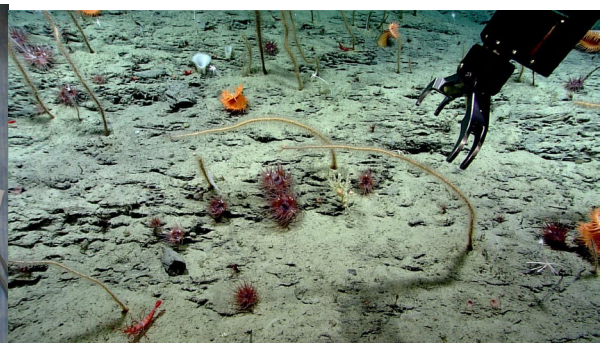
Sample ID	EX2306_D18_03B
Date (UTC)	20230912
Time (UTC)	205206
Depth (m)	1805.71203613281
Latitude (decimal degrees)	59.073802947998
Longitude (decimal degrees)	-147.011993408203
Temp. (°C)	2.11700010299683
Field ID(s)	Coraliidae

Associates Sample ID:	EX2306_D18_03B_A01B
Field Identification:	Polynoidae
Count:	1

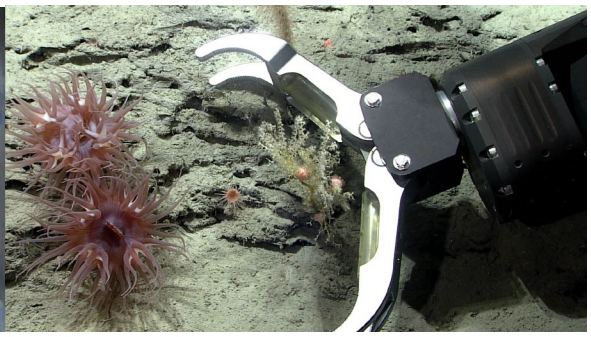
Sample ID	EX2306_D18_05B
Date (UTC)	20230912
Time (UTC)	210040
Depth (m)	1804.30395507813
Latitude (decimal degrees)	59.0738487243652
Longitude (decimal degrees)	-147.012023925781
Temp. (°C)	2.14199995994568
Field ID(s)	Lophaster

Sample ID	EX2306_D18_06B
Date (UTC)	20230912
Time (UTC)	210636
Depth (m)	1806.61096191406
Latitude (decimal degrees)	59.0737457275391
Longitude (decimal degrees)	-147.01188659668
Temp. (°C)	2.13299989700317
Field ID(s)	Cladorhizidae
Comments	Amphipod prey associates but too embedded in tissue to extricate.





Sample ID	EX2306_D18_07B
Date (UTC)	20230912
Time (UTC)	214943
Depth (m)	1768.26000976563
Latitude (decimal degrees)	59.0733413696289
Longitude (decimal degrees)	-147.011703491211
Temp. (°C)	2.15000009536743
Field ID(s)	Serpulidae
Comments	Many hydroid associates on the tube, too many to remove during processing.



Sample ID	EX2306_D18_08B
Date (UTC)	20230912
Time (UTC)	215249
Depth (m)	1768.60095214844
Latitude (decimal degrees)	59.0733528137207
Longitude (decimal degrees)	-147.011779785156
Temp. (°C)	2.14400005340576
Field ID(s)	Acanthogorgiidae
Comments	Amphipod tubes identified. Left intact with specimen.

Associates Sample ID:	EX2306_D18_08B_A01B
Field Identification:	Anemone
Count:	1

Sample ID	EX2306_D18_09G
Date (UTC)	20230912
Time (UTC)	215520
Depth (m)	1768.27905273438
Latitude (decimal degrees)	59.0733032226563
Longitude (decimal degrees)	-147.011734008789
Temp. (°C)	2.14299988746643
Field ID(s)	Mudstone
Comments	medium gray clay stone with clam boring

Associates Sample ID:	EX2306_D18_09G_A01B
Field Identification:	Bryozoa
Count:	1

Niskin Sampling Summary

Sample ID	EX2306_D18_01W
Date (UTC)	20230912
Time (UTC)	190413
Depth (m)	1865.18395996094
Latitude (decimal degrees)	59.0746574401855
Longitude (decimal degrees)	-147.012725830078
Bottle Number	Niskin Bottle 1
Temperature	2.02500009536743
Dissolved Oxygen (mg/L)	1.58299994468689
Treatment	DNA/RNA Shield

Sample ID	EX2306_D18_04W
Date (UTC)	20230912
Time (UTC)	205344
Depth (m)	1805.54797363281
Latitude (decimal degrees)	59.0737686157227
Longitude (decimal degrees)	-147.011932373047
Bottle Number	Niskin Bottle 2
Temperature	2.11100006103516
Dissolved Oxygen (mg/L)	1.32500004768372
Treatment	DNA/RNA Shield

Sample ID	EX2306_D18_10W
Date (UTC)	20230912
Time (UTC)	222908
Depth (m)	1757.65197753906
Latitude (decimal degrees)	59.0732421875
Longitude (decimal degrees)	-147.011383056641
Bottle Number	Niskin Bottle 3
Temperature	2.16199994087219
Dissolved Oxygen (mg/L)	1.29799997806549
Treatment	DNA/RNA Shield

Sample ID	EX2306_D18_11W
Date (UTC)	20230912
Time (UTC)	231620
Depth (m)	1736.5009765625
Latitude (decimal degrees)	59.0727653503418
Longitude (decimal degrees)	-147.011199951172
Bottle Number	Niskin Bottle 4
Temperature	2.03600001335144
Dissolved Oxygen (mg/L)	1.46300005912781
Treatment	DNA/RNA Shield

Sample ID	EX2306_D18_12W
Date (UTC)	20230913
Time (UTC)	001806
Depth (m)	422.119995117188
Latitude (decimal degrees)	59.0674476623535
Longitude (decimal degrees)	-147.010162353516
Bottle Number	Niskin Bottle 5
Temperature	4.22700023651123
Dissolved Oxygen (mg/L)	1.10399997234344
Treatment	DNA/RNA Shield

Scientists Involved

Name	Affiliation
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Arvind Shantharam	NCEI
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Christina Conrath	NOAA
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