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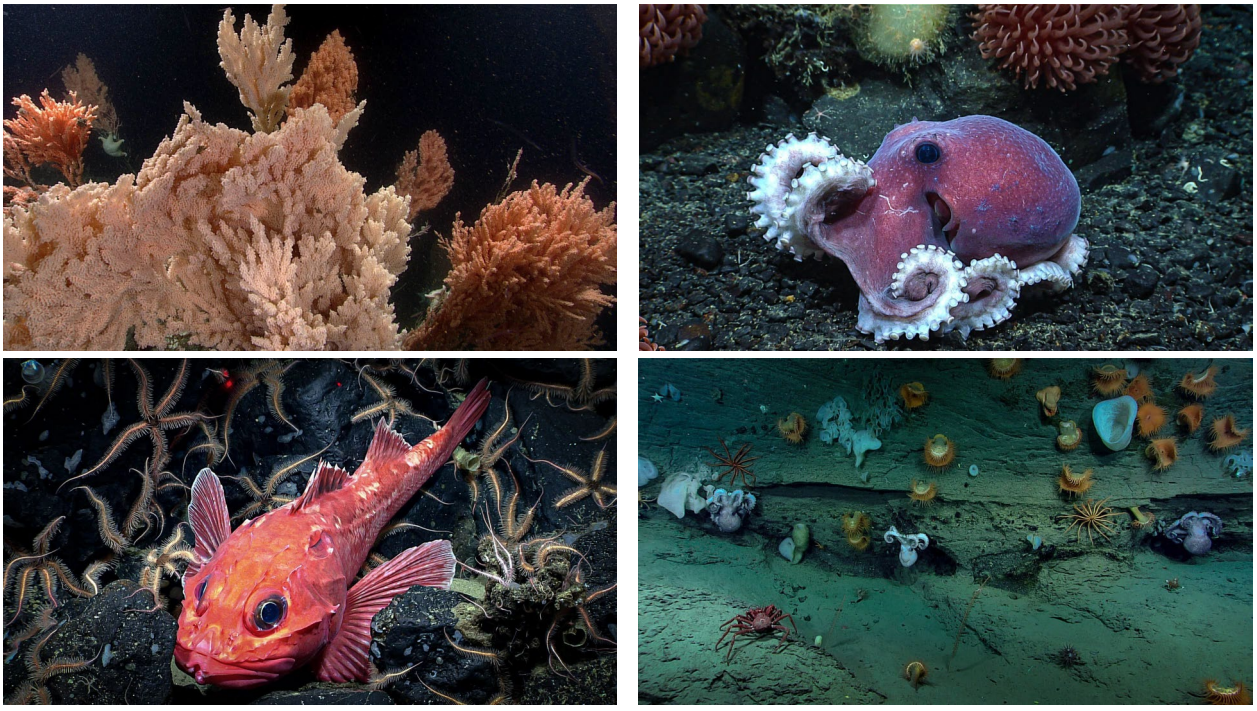
# Expedition Report: EX2306, Seascape Alaska 5: Gulf of Alaska Remotely Operated Vehicle Exploration and Mapping



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# Abstract

From August 23rd - September 14th, 2023 (Kodiak, Alaska to Seward, Alaska), NOAA Ocean Exploration conducted Seascape Alaska 5: Gulf of Alaska Remotely Operated Vehicle Exploration and Mapping (EX2306), a remotely operated vehicle (ROV) and mapping expedition to the Gulf of Alaska aboard NOAA Ship *Okeanos Explorer*. Operations during this 23-day expedition included the completion of nineteen successful remotely operated vehicle (ROV) dives, which were conducted in water depths ranging from 253.1 m to 4261.5 m for approximately 87 hours of bottom time and resulted in the collection of 383 samples. EX2306 also mapped 28,278 sq. km of seafloor (23,766 sq. km within the U.S. Exclusive Economic Zone). All data associated with this expedition will be archived and publicly available through the NOAA archives.

**Region of Operation:** Gulf of Alaska

**Ports:** Kodiak, Alaska to Seward, Alaska

**Bounding Coordinates:** -131.938730, 53.233525 ; -153.052067, 60.92988

**Expedition Dates:** August 23rd - September 14th, 2023

**Expedition Type:** ROV and Mapping

**Theme Keywords:** Marine Archeology, Deep-Sea Corals, Seascape Alaska, Cold-Seeps, Seamounts

**Place Keywords:** West Coast, Gulf of Alaska, Inside Passage

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# 1. Introduction

NOAA Ocean Exploration is dedicated to exploring the unknown ocean, unlocking its potential through scientific discovery, technological advancements, and data delivery. By working closely with partners across public, private, and academic sectors, we are filling gaps in our basic understanding of the marine environment. This allows us, collectively, to protect ocean health, sustainably manage our marine resources, accelerate our national economy, better understand our changing environment, and enhance appreciation of the importance of the ocean in our everyday lives.

With priority placed on exploration of deep waters and the waters of the U.S. Exclusive Economic Zone (EEZ), NOAA Ocean Exploration applies the latest tools and technologies to explore previously unknown areas of the ocean, making discoveries of scientific, economic, and cultural value. By making collected data publicly available in increasingly innovative and accessible ways, we provide a unique and centralized national resource of critical ocean information. And, through live exploration video, online resources, training and educational opportunities, and public events, we share the excitement of ocean exploration with people around the world and inspire and engage the next generation of ocean scientists, engineers, and leaders.

NOAA Ocean Exploration uses NOAA Ship *Okeanos Explorer* to conduct much of this work. Data collected by NOAA Ocean Exploration on NOAA Ship *Okeanos Explorer* in the Gulf of Alaska will contribute to Seascape Alaska. Seascape Alaska is a multiyear, multipartner cooperative research campaign with an aim to create accessible, high-quality modern seabed data for Alaskan waters to support U.S. research, resource management, sustainable economic growth, and the health and security of Americans. The goal of Seascape Alaska is working to fully map the U.S. waters off Alaska through collaborative efforts among federal, tribal, state, and nongovernmental partners with a wide range of interests and dependencies on mapping data across coastal and ocean waters throughout the U.S. EEZ.

NOAA Ocean Exploration's expeditions on NOAA Ship *Okeanos Explorer* also contribute to the National Strategy for Mapping, Exploring, and Characterizing the United States Exclusive Economic Zone and Seabed 2030.

# 2. Expedition Overview

From August 23rd to September 14th, 2023, NOAA Ocean Exploration and partners conducted a telepresence-enabled ocean exploration expedition on *Okeanos Explorer* to collect critical baseline information and improve knowledge about unexplored and poorly understood deepwater areas of the Gulf of Alaska (EX2306). Previous expeditions in this region include the 2004 Gulf of Alaska Seamount Expedition, EX2302, EX2303, EX2304, EX2305, and KM2309.

During the 23 days at sea, there were nineteen remotely operated vehicle (ROV) dives, and 28,278 sq. km of bathymetric data were collected (see **Figure 1**). Section 5 provides details about the expedition schedule and unplanned events. A station log detailing the location of each operation conducted is provided as a supplemental file to this expedition report.

Names, roles, and affiliations of science team members, both on ship and shore, are in **Appendix A**.

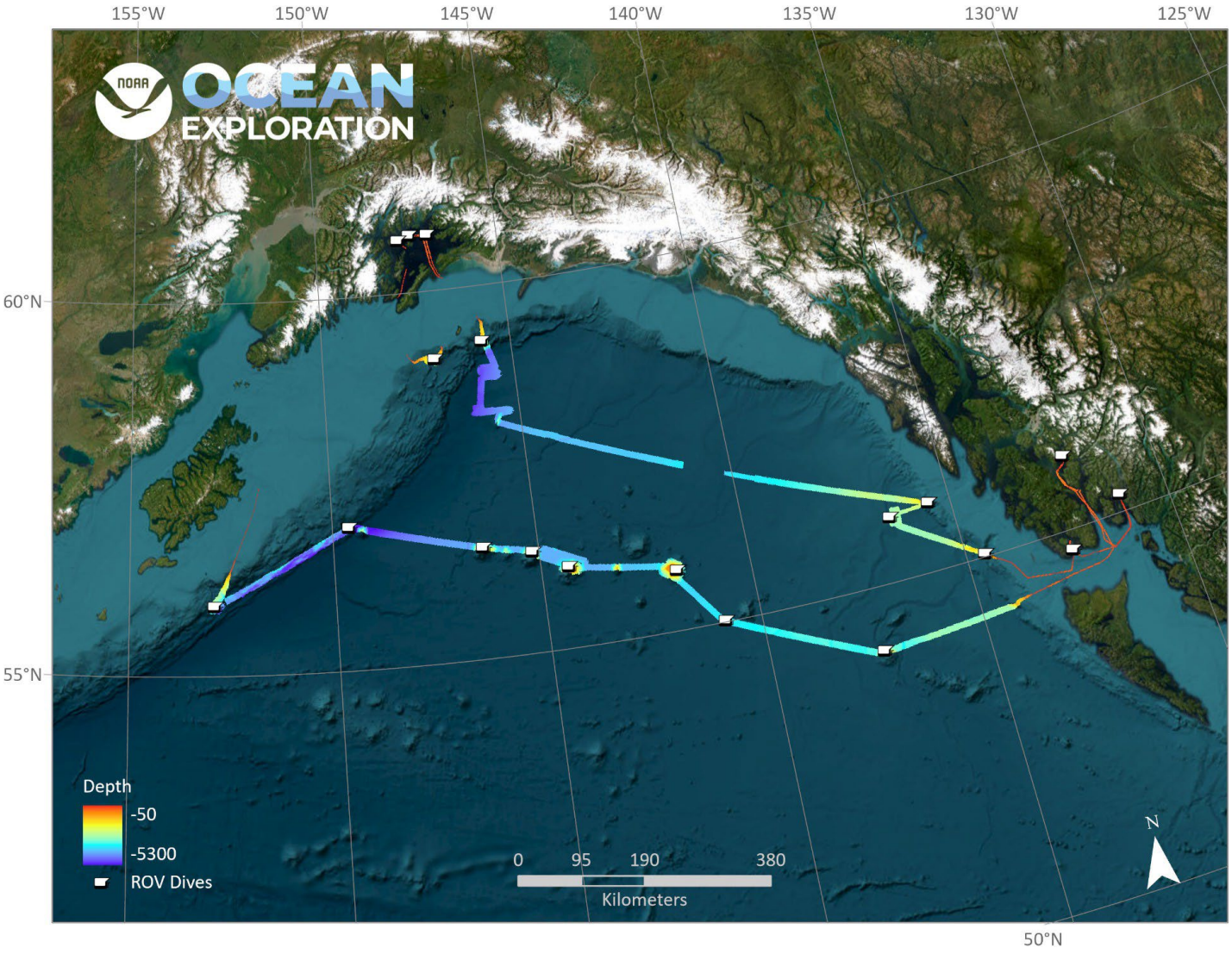


**Figure 1.** Map showing EX2306's track, 19 remotely operated vehicle dive sites, and bathymetric data collected.

## 2.1 Rationale for Exploration

As part of the planning for this expedition, NOAA Ocean Exploration collaborated with the ocean science and management communities to assess exploration needs and data gaps in unknown and poorly known areas of the Gulf of Alaska. To define the operating area for this expedition, we considered the 2022 call for input, results from the 2023 Alaska Marine Science Symposium, and known priorities from resource managers.

Alaska's coastline is longer than that of any other U.S. state or territory and is approximately one-third of the entire U.S. coastline. Despite representing the largest distinct region of the U.S. Exclusive Economic Zone (EEZ), Alaska's waters remain one of the least explored areas in the United States. According to the "Progress Report on Unmapped U.S. Waters" (IOCM 2023), only 34% of Alaskan waters had been mapped to modern standards (100 meters) as of January 2023. Additionally, many of the deepwater habitats of the Gulf of Alaska, Aleutian Islands, and the Aleutian trench remain largely unexplored.

Mapping and exploring Alaska's deep waters will provide baseline information needed to sustainably manage and protect these areas. Filling data gaps and increasing the understanding of this region has far-reaching benefits, including safer navigation and community access, hazard mitigation, preservation of marine habitats and heritage, a deeper comprehension of natural resources, and fisheries management.

Data and information from this expedition will inform deep-sea management plans for habitat areas of particular concern, marine protected areas, and national marine sanctuaries, support local scientists and managers seeking to understand and manage deep-sea resources, and stimulate subsequent exploration, research, and management activities.

This expedition contributed to ongoing collaborations with the NOAA Alaska Fisheries Science Center, the Deep Sea Coral Research and Technology Program, the United States Geological Survey, Bureau of Ocean Energy Management, Fisheries and Oceans Canada, University of Alaska, University of Gothenburg, University of Idaho, Senckenberg Research Institute and Natural History Museum, U.S. Environmental Protection Agency, and the Woods Hole Oceanographic Institute.

## 2.2 Objectives

EX2306 addressed scientific themes and priority areas put forward by NOAA scientists and partners listed above, and the broader ocean science and management communities. The primary objective of the expedition was to explore deepwater areas in the Gulf of Alaska to provide baseline information to support science and management needs. Briefly, this expedition sought to:

- Collect high-resolution bathymetry in areas with no or low-quality mapping data.

- Investigate biogeographic patterns of deep-sea ecosystems and connectivity across the Gulf of Alaska for use in broader comparisons of deepwater habitats throughout the northern Pacific Ocean.
- Map, survey, and sample geological features within the Gulf of Alaska to better understand the geological context of the region.
- Acquire a foundation of ROV, sonar, and oceanographic data to better understand the characteristics of the water column and fauna that live there.
- Collect biology, geology, and water samples for environmental DNA (eDNA) analysis as dictated by expedition priorities and for public access.
- Identify, map, and explore the diversity and distribution of benthic habitats, including fish habitats, deep-sea coral and sponge communities, chemosynthetic communities, and biological communities that colonize or aggregate around shipwrecks.
- Explore U.S. maritime heritage by identifying and investigating sonar anomalies as well as characterizing shipwrecks with video investigation.
- Engage a broad spectrum of the scientific community and the public in telepresence-based exploration.
- Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.

A full list of expedition objectives is in "Project Instructions: EX2306 Seascape Alaska 5: Gulf of Alaska Remotely Operated Vehicle Exploration and Mapping" (Candio, et al. 2023).

# 3. Methodology

The primary systems used throughout EX2306 to accomplish objectives were:

- Sonar systems (Kongsberg EM 304 MKII multibeam sonar, Knudsen 3260 sub-bottom profiler, Simrad EK60 and EK80 split-beam sonars, and Teledyne acoustic Doppler current profilers) to conduct seabed and water column mapping operations, and provide situational awareness for ROV operations.
- NOAA Ocean Exploration's dual-bodied ROV system (ROVs *Deep Discoverer* and *Seirios*) to conduct daytime seafloor and water column visual surveys, as well as to collect a limited number of samples to help further characterize the deepwater fauna and geology of the region.
- A high-bandwidth satellite connection to provide real-time ship-to-shore communications (telepresence).

The following sections further detail the equipment and procedures used by NOAA Ocean Exploration during expeditions on *Okeanos Explorer*.

## 3.1 Acoustic Operations

Acoustic operations included Kongsberg EM 304 MKII multibeam sonar, Simrad EK60 and EK80 split-beam sonar, Knudsen 3260 sub-bottom profiler, and acoustic Doppler current profiler (ADCP) data collection to map the seafloor, sub-seafloor, and water column, as well as to provide operational information for ROV dives. Standard survey operations include concurrent collection of multibeam, split-beam, and sub-bottom sonar data synchronized using a Kongsberg Synchronization Unit (K-Sync) with the EM 304 set as the master. The ADCPs were secured during standard surveying operations due to interference with other sonars, but were used to collect data when entering and exiting port and during ROV operations. During conductivity, temperature, and depth system (CTD) and ROV operations, the EM 304 multibeam sonar and Knudsen sub-bottom profiler were secured while the ADCPs and split-beam sonars collect data.

Mapping operations were planned to maximize edge matching of existing data or to fill data gaps in areas with incomplete bathymetric coverage. In regions with no existing data, lines were optimized for potential discoveries and to complete relatively large continuous areas to support interpretation of features from bathymetry and backscatter. Targeted mapping operations were conducted throughout the Gulf of Alaska. Mapping operations were carried out during overnight transits and other intervals between ROV dives.

More information about general equipment calibration procedures, data collection, processing, reporting, and archiving is in the “NOAA Ocean Exploration Deepwater Exploration Mapping Procedures Manual” (Hoy et al., 2020).

### 3.1.1 Equipment and Data Collection Methods

Detailed descriptions of mapping equipment, annual calibrations, and capabilities on *Okeanos Explorer* are in the “NOAA Ship *Okeanos Explorer* Mapping Systems Readiness Report 2023” (Candio, et al., 2023). Any deviations from the readiness report are noted in the following sections.

Supplemental files may be added to the readiness report throughout the year if changes to the equipment are made, such as mid-season calibrations. So, users of mapping data from EX2306 should refer to the 2023 readiness report to see if any supplemental files report changes that may affect their analysis.

#### 3.1.1.1 Multibeam Sonar

*Okeanos Explorer* is equipped with a 26 kHz Kongsberg EM 304 MKII multibeam sonar. The multibeam sonar was used to collect seafloor bathymetry, seafloor backscatter, and water column backscatter. Bathymetric and seafloor backscatter data are stored in .kmall files. Water column backscatter data are stored separately in .kmwcd files.

Throughout the expedition, mapping watchstanders monitored multibeam data quality in real time. Ship speed was adjusted to maintain data quality and sounding density as necessary, and line spacing was planned to ensure one-quarter to one-third swath-width overlap between lines, depending on the environmental conditions and impact on the quality of the outer swath regions. Maximum angles in Kongsberg's Seafloor Information System software (SIS) were generally left open to 65°/65° during transit to maximize data collection and were adjusted on the port and starboard sides to ensure the best data quality and coverage. If outer beams were returning obviously spurious soundings (e.g., due to attenuation or low grazing angle), beam angles were gradually reduced and monitored closely until a high-quality swath was obtained.

Real-time surface sound speed values were provided by a Reson SV70 sound velocity probe mounted in close proximity to the EM 304 transducer and were monitored in SIS for deviations from the values determined by sound speed casts. Sound speed profiles were collected every six hours or more frequently as dictated by local oceanographic conditions (typically every two hours when operating in more dynamic areas).

Vessel positioning and attitude were measured by Applanix POS MV V5 and Kongsberg Seapath 380 positioning systems during data collection. This redundancy allows for either system to be the primary source of positioning/attitude for the multibeam data in the event that one of them fails. Positioning/attitude data were applied to the multibeam data in real time and were stored in .kmall files. The primary system used will be noted in the processing logs.

During EX2301, a multibeam geometric calibration ("patch test") was conducted. The results of the multibeam calibration are archived with the 2023 mapping readiness report as a supplemental file (Candio, et al., 2023).

Additionally, multibeam mapping operations were conducted directly over planned ROV dive sites to collect seafloor mapping data to help refine dive plans. A targeted maritime heritage mapping survey was conducted in the southeastern Gulf of Alaska to search for the *MS Prinsendam*, a Holland-America Line cruise ship that caught fire and subsequently sank in October of 1980 leading to the second largest rescue and recovery operation in US Coast Guard history. One potential target was investigated, however no evidence of the ship was discovered.

### 3.1.1.2 Sub-Bottom Profiler

*Okeanos Explorer* is equipped with a Knudsen 3260 sub-bottom profiler with a central frequency of 3.5 kHz. This sonar was used to collect echogram images of shallow geological layers underneath the seafloor from 10s to 100s of meters below the seafloor. Phase, range, and gain were monitored and optimized for data collection. New files were created when changes were made to pulse lengths and/or power settings.

### 3.1.1.3 Split-Beam Sonars

*Okeanos Explorer* is equipped with a suite of five Simrad EK60 and EK80 split-beam sonars: three general purpose transceivers (GBTs), the 18, 120, and 200 kHz sonars, and two wide-band transceivers (WBTs), the 38 and 70 kHz sonars. These quantitative scientific echosounders were calibrated to identify the target strength of water column acoustic reflectors (e.g., deep scattering layers, fish, gas bubbles from seeps), providing additional information about water column characteristics and anomalies.

Calibrations were performed during EX2305, and these calibration values were most appropriate for the EX2306 dataset. The calibration files are archived with the sonar data, and the calibration report is available as a supplemental file to the 2023 mapping readiness report (Candio et al).

The split-beam sonars were used continuously throughout EX2306 during overnight mapping operations and daytime ROV operations. EK60 and EK80 data were used during ROV water column transects to detect the depth of the deep scattering layers.

### 3.1.1.4 Acoustic Doppler Current Profiler

*Okeanos Explorer* is equipped with two acoustic Doppler current profilers (ADCPs), a Teledyne Workhorse Mariner (300 kHz) and a Teledyne Ocean Surveyor (38 kHz). Depending on environmental conditions, the 300 kHz system provides ocean current data to a depth of approximately 70 m, and the 38 kHz system provides data to a depth of approximately 1,200 m. The ADCPs were used to gather data prior to ROV and CTD deployments to assess currents in support of safe operations.

## 3.1.2 Data Processing and Quality Assessment Methods

### 3.1.2.1 Multibeam Sonar Bathymetry and Seabed Backscatter

Full-resolution multibeam files (.kmall) were imported into QPS Qimera software and then processed and cleaned of noise and artifacts. Outlier soundings were removed using multiple methods, including automatic filtering and/or manual cleaning with the swath and subset editing tools. The default sound speed scheduling method used was “Nearest-in-Time” with a sound velocity profile (SVP) crossfade of 60 seconds. If another method was used, it was noted in the multibeam processing log that is archived with the dataset. Gridded digital terrain models were created using the weighted moving average algorithm and were exported in multiple formats using QPS Fledermaus. Daily bathymetric surfaces were created and sent to shore.

A final quality check of the data was performed on shore prior to submission to the archive. This involved additional fine cleaning of soundings and minimization of residual artifacts from sound speed biases and field-cleaning errors. Depth values were compared against orthogonal lines (crosslines) to evaluate the consistency of the multibeam sonar data collected during the

expedition (**Figure 2**). A crossline analysis was completed using the Crosscheck Tool in QPS Qimera (**Table 1**) to evaluate the data against the Order 1 S-44 standards set by the International Hydrographic Organization (IHO 2008).

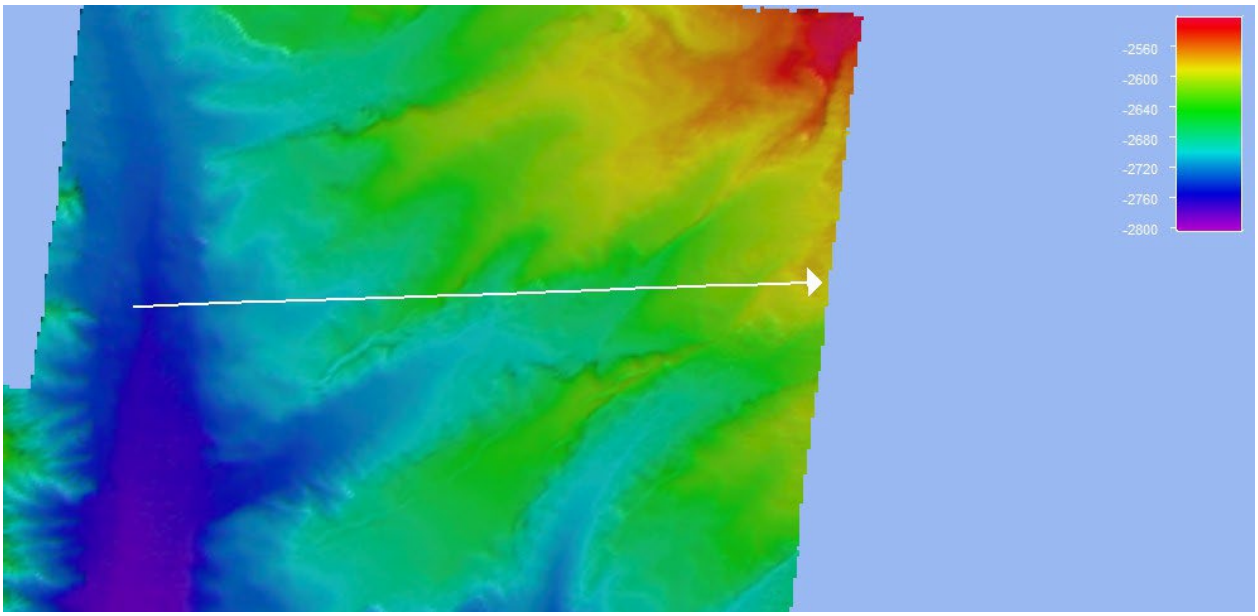


**Figure 2.** EX2306 crossline (shown as east-facing arrow) used for comparison against the bathymetric grid generated via orthogonal multibeam survey lines.

**Crossline file:**

0296_20230907_103237_EX2306_MB.kmall

**Mainscheme line file:**

0277_20230906_235325_EX2306_MB.kmall

0278_20230907_005325_EX2306_MB.kmall

0280_20230907_014511_EX2306_MB.kmall

0281_20230907_024511_EX2306_MB.kmall

0283_20230907_034046_EX2306_MB.kmall

0284_20230907_044046_EX2306_MB.kmall

0286_20230907_054305_EX2306_MB.kmall

0287_20230907_064305_EX2306_MB.kmall

0289_20230907_073703_EX2306_MB.kmall

0290_20230907_083703_EX2306_MB.kmall

0293_20230907_092956_EX2306_MB.kmall

0294_20230907_101943_EX2306_MB.kmall

0295_20230907_102626_EX2306_MB.kmall

**Table 1.** Crosscheck results.

| Statistic | Value |
|---|---|
| Number of Points of Comparison | 565168 |
| Grid Cell Size (m) | 75.000 |
| Difference Mean (m) | 1.135553 |
| Difference Median (m) | 1.239660 |
| Difference Standard Deviation (m) | 2.220934 |
| Difference Range (m) | [-23.68, 23.17] |
| Mean + 2* Standard Deviation (m) | 5.577422 |
| Median + 2* Standard Deviation (m) | 5.681528 |
| Data Mean (m) | -2666.867702 |
| Reference Mean (m) | -2668.003256 |
| Data Z-Range (m) | [-2774.93, -2562.15] |
| Reference Z-Range (m) | [-2765.16, -2567.64 |
| Order 1 Error Limit (m) | 34.687645 |
| Order 1 # Rejected | 0 |
| Order 1 P-Statistic | 0.0000 |
| Order 1 Survey | Accepted |

The results in **Table 1** confirm that the data collected meet International Hydrographic Organization Order 1 specifications for data quality.

Each line of cleaned full-resolution data was exported to a .gsf file (Level-01 data). The processed and cleaned files were used to create a static surface in QPS Qimera. This final surface was re-projected to the field geographic WGS84 reference frame in QPS Fledermaus and saved as an .sd file for archiving. Using QPS Fledermaus, this .sd bathymetric grid file was then exported as ASCII .xyz, color .tif, floating point .tif, and Google Earth .kmz files. The .gsf files were used to create daily backscatter mosaics using QPS Fledermaus FMGT software.

All products maintain horizontal referencing to WGS84 (G1762) and vertical referencing to the assumed mean waterline (based on the waterline measured during the annual shakedown expedition). The draft values for *Okeanos Explorer* used during the expedition are in **Table 2** for the purpose of further post-processing, if desired by the user. Positioning data files for post-processing be requested by sending an email to ex.expeditioncoordinator@noaa.gov.

**Table 2.** *Okeanos Explorer*'s draft at the beginning and end of EX2306.

| Location | Start of Expedition (08/23/2023) | End of Expedition (09/14/2023) |
|---|---|---|
| Forward | 13' 5.5"' | 14' 5'' |
| Aft Starboard | 14' 5'' | 14' 1.5'' |
| Aft Port | 15' 0'' | 14' 6'' |

### 3.1.2.2 Multibeam Sonar - Water Column

EM 304 water column files (.kmwcd) were reviewed in QPS FM Midwater or Qimera for anomalies (e.g., gas seeps and hydrothermal plumes). EM 304 files (.kmwcd) that include observed water column anomalies are flagged in the dataset's relevant processing logs. Locations of observed anomalies are provided in the data package (.shp and .csv files). All products maintain horizontal referencing to WGS84 (G1762) and vertical referencing to the assumed mean waterline.

### 3.1.2.3 Split-Beam Sonars

EK files that include observed water column anomalies are flagged in the dataset's relevant processing logs. Locations of observed anomalies (.shp files) are provided in the data package along with screenshots (.png files) of the observed anomaly. All products maintain horizontal referencing to WGS84 (G1762) and vertical referencing to the assumed mean waterline.

Calibration reports and files will be archived with the split-beam data.

### 3.1.2.4 Sub-Bottom Profiler

Using Natural Resources Canada's SEGYJp2 software, the raw files (.sgy) from the sub-bottom profiler were processed for gain to produce the clearest image of sub-bottom layers. The gain processed files were converted to jpeg images (.jpg) and shapefile tracklines (.shp).

### 3.1.2.5 Sound Speed

Raw sound speed profiles collected from expendable bathythermographs (XBTs) were processed using HydrOffice Sound Speed Manager and archived as .asvp files.

### 3.1.3 Data Collection and Processing Software

**Table 3** provides a list of the data collection and processing software versions used during EX2306.

**Table 3.** Versions of data collection and processing software used during EX2306.

| Software | Purpose | Version |
|---|---|---|
| SIS | EM 304 | 5.11.1 |
| EK80 | EK suite | 21.15.2 |
| EchoControl | Knudsen | 4.09 |
| UHDAS | ADCPs | 14.04 |
| AMVERSEAS | Autolaunch XBT | 9.3.6 |
| WinMK21 | XBT | 3.0.2 |
| K-Sync | Synchronization | 1.9.0 |
| Qimera | Bathymetry | 2.5.3 |
| FMGT | Backscatter | 7.10.3 |
| FM Midwater | Water Column | 7.9.4 |
| Sound Speed Manager | Sound Speed Profiles | 2021.1.6 |
| NRCan (SegJp2) | Sub-Bottom | 1.0 |
| Fledermaus 7 | Visualization/Data Analysis | 7.8.12 |

## 3.2 ROV Operations

ROV dive operations supported the expedition objectives in Section 2.2 and included high-resolution visual surveys of seafloor and water column habitats as well as geological and biological sampling. Each ROV dive was approximately 8-10 hours, conditions and logistics permitting. Dives were primarily conducted during the day. Information about the general process of site selection, collaborative dive planning, scientific equipment on the ROVs, and the approach to benthic exploration used on *Okeanos Explorer* can be found in Kennedy et al. (2019) and Quattrini et al. (2015).

During each benthic dive, the ROVs descended to the seafloor and then moved from waypoint to waypoint, documenting the geology and biology of the area. During dives, science team members on ship and shore identified each organism observed to the lowest taxon possible based on data available during real-time assessment and provided geological interpretations of the observed substrate. These observations were recorded using a cloud-based, crowd-sourced annotation system developed by Ocean Networks Canada called SeaTube. They will go through quality control at the University of Hawai‘i’s Deep-Sea Ecology Lab, led by Jeff Drazen prior to archiving.

Detailed information about ROV operations is in the "NOAA Ocean Exploration ROV and Telepresence Deepwater Exploration Procedures Manual" (Galvez et al. 2024).

## 3.3 Sampling Operations

Geological, biological, and water samples were collected on the seafloor using ROV *Deep Discoverer*'s manipulator arms and associated tools and stored in the bioboxes, rock boxes, rotary suction sampler jars, and Niskin bottles. The primary purpose of the sampling operations was to collect voucher samples that will be publicly available for site characterization. In addition, geological samples were collected for rock type description, and biological samples were collected of organisms that represented potential new species, range or depth extensions, dominant species at a site, and/or rare morphotypes, and to support biological connectivity studies.

At the time of collection, the date, time, latitude, longitude, depth, salinity, temperature, and dissolved oxygen content were recorded for each sample.

After vehicle recovery, samples were examined for associated organisms, labeled, photographed, and entered into the Sampling Operations Database Application (SODA, Gottfried et al. 2023) with all relevant metadata. Any associated organisms found were separated from primary samples and processed separately as "associate" samples.

See Appendix C for inventories of all samples collected during EX2306. Detailed information about sampling operations is in the "NOAA Ocean Exploration Sampling Procedures Manual" (Dunn et al. 2023).

### 3.3.1 Geological Samples

Geological samples were air dried and placed in rock bags or small containers depending on the size of the sample. These samples will be shipped to the Marine and Geological Repository at Oregon State University after the conclusion of the NOAA Ocean Exploration field season on *Okeanos Explorer*. The samples will be sectioned, photographed, and their data will be entered into the university's online database. Polished thin sections will be made for each lithified sample.

### 3.3.2 Biological Samples

Biological samples were subsampled for inclusion in the Smithsonian National Museum of Natural History Biorepository for future DNA barcoding and DNA extraction. For this purpose, a small subsample (~1 $cm^2$) was removed from the original sample and placed in 95% analytical grade ethanol (EtOH).

For most of the biological samples, the remainder of the sample was also preserved in 95% ethanol. For select taxa, vouchers or subsamples were preserved in 10%, 5%, or 4% buffered

formalin per recommendations from taxonomic experts and guidance provided by the Smithsonian National Museum of Natural History. Details of the preservation of each biological sample are in the associated metadata record. All voucher samples and subsamples were shipped to the Smithsonian National Museum of Natural History for long-term archiving and public access.

### 3.3.3 Water/eDNA Samples

As many as five 1.7 liter water samples per dive were collected in ROV Niskin bottles for eDNA analysis. During benthic dives, water samples were collected at the discretion of the science leads.

Once on board the ship water samples were filtered using a 0.45 µm filter and the filters were fixed with DNA/RNA Shield, a preservative that keeps DNA stable at room temperature. For each dive's set of water samples, a negative control of tap water was processed at the same time. Details of the timing and associated collection data for each water sample are in the associated metadata record. All eDNA samples were shipped to the Smithsonian National Museum of Natural History for further processing (DNA extraction and sequencing), long-term archiving, and public access.

## 3.4 Conductivity, Temperature, and Depth

CTD measurements were collected with the integrated ROV CTD system (Seabird (SBE) 9/11+). This system records data from the CTD, dissolved oxygen (DO), and oxygen reduction potential (ORP) sensors on every dive.

# 4. Environmental and Historical Compliance

General records of multi-expedition environmental and historical compliance are in the "NOAA Ship *Okeanos Explorer* FY23 Field Season Instructions" as supplemental files (Cuellar 2023).

Overviews of expedition-specific compliance activities are provided below. Copies of associated records of compliance are in **Appendix B**.

## 4.1 Environmental Compliance

Pursuant to the National Environmental Policy Act (NEPA), NOAA Ocean Exploration is required to include in its planning and decision-making processes appropriate and careful consideration of the potential environmental consequences of actions it proposes to fund, authorize, and/or conduct. The companion manual (NOAA 2017) for NOAA Administrative Order 216-6A: Compliance with the National Environmental Policy Act, et al. describes the agency's specific procedures for NEPA compliance.

An environmental review memorandum was completed for all *Okeanos Explorer* expeditions in 2023 in accordance with Section 4 of the companion manual in the form of a categorical exclusion worksheet. Based on this review, a categorical exclusion was determined to be the appropriate level of NEPA analysis necessary, as no extraordinary circumstances existed that required the preparation of an environmental assessment or environmental impact statement. NOAA Ocean Exploration is preparing a programmatic environmental assessment to cover future expeditions.

## 4.2 Historical Compliance

NOAA Ocean Exploration's maritime heritage-related activities are informed by the Federal Archaeology Program (FAP), U.S. legislation on the treatment of cultural remains, and the UNESCO "Convention for the Protection of the Underwater Cultural Heritage" (UNESCO 2001). Thus, NOAA Ocean Exploration adheres to the research standards and management practices directed by the National Historic Preservation Act of 1966 (NHPA, 54 U.S.C. 300101 *et seq*.) and follows the guidelines in the Rules Concerning Activities Directed at Underwater Cultural Heritage, an annex to the "Convention on the Protection of the Underwater Cultural Heritage."

Details about NOAA Ocean Exploration's maritime heritage policies are in the field season instructions as supplemental files (Cuellar 2023).

# 5. Schedule

**Table 4** provides a day by day breakdown of EX2306. 23 dives were scheduled, 19 dives occurred (details are in **Tables 4 and 5**). Three dives were canceled due to weather. Additionally, the ship returned to port two days early due to weather.

**Table 4.** EX2306 schedule.

| Date (UTC) | Activity |
|---|---|
| 08/22 | Mobilization in Kodiak, Alaska. |
| 08/23 | Depart Kodiak, transit mapping to first dive site. |
| 08/24 | Dive 01 was conducted on potential landslide deposits in the Gulf of Alaska. Overnight transit mapping to Dive 02. |
| 08/25 | Dive 02 was conducted on a potential seep location. Overnight transit mapping to Dive 03. |
| 08/26 | Dive 03 was conducted on the north side of Giacomini Seamount. Overnight transit mapping to Dive 04. |
| 08/27 | Dive 04 was conducted on the north side of Quinn Seamount. Overnight transit mapping to Dive 05. |

| Date (UTC) | Activity |
|---|---|
| 08/28 | Dive 05 was conducted on the north side of Surveyor Seamount. Overnight transit mapping to Dive 06. |
| 08/29 | Dive 06 was conducted on Durgin Guyote. Overnight transit mapping to Dive 07. |
| 08/30 | Dive 07 was conducted on Deep Discover Dome. Overnight transit mapping to Dive 08. |
| 08/31 | Dive 08 was conducted on Denson Seamount. Overnight transit mapping to Dive 09. |
| 09/01 | Dive canceled due to weather. Transit mapping to Dive 09. |
| 09/02 | Dive 09 was conducted in Earnest Sound. Overnight transit mapping to Dive 10. |
| 09/03 | Dive 10 was conducted in Behm Canal. Overnight transit mapping to Dive 11. |
| 09/04 | Dive 11 was conducted in Cordova Bay. Overnight transit mapping to Dive 12. |
| 09/05 | Dive 12 was conducted on Noyes Canyon. Overnight transit mapping to Dive 13. |
| 09/06 | Dive 13 consisted of a search for MS Prinsendam. Overnight transit mapping to Dive 14. |
| 09/07 | Dive 14 was conducted on Chatham Seep. Overnight transit mapping to Dive 15. |
| 09/08 | Dive canceled due to weather, transitioned to 24-hour mapping operations. |
| 09/09 | Dive canceled due to weather, transitioned to 24-hour mapping operations. |
| 09/10 | Dive 15 was conducted on Middleton Seamount. Overnight transit mapping to Dive 16. |
| 09/11 | Dive 16 and Dive 17 were conducted Prince William Sound. Overnight transit mapping to Dive 18. |
| 09/12 | Dive 18 was conducted on Gumby Ridge in Gulf of Alaska. Overnight transit mapping to Dive 19. |
| 09/13 | Dive 19 was conducted near Lone Island in Prince William Sound. Overnight transit mapping to Seward, Alaska. |
| 09/14 | Arrive in Seward, Alaska; demobilization efforts begin. |
| 09/15 -9/16 | Demobilization. |
| 9/17 | Seward Science Symposium. |
| 9/18 - 9/21 | Various ship tours. |

# 6. Results

This section details the results of EX2306. Metrics for the expedition's major scientific work are in **Table 5**. A station log detailing the location of each operation conducted is provided as a supplemental file to this expedition report.

**Table 5.** Summary of scientific metrics for EX2306.

| Metrics | Totals |
|---|---|
| Days at Sea | 23 |
| Days at Sea in U.S. Waters | 20 |
| Linear km Mapped by EM 304 | 4,637 |
| Sq. km Mapped by EM 304 | 28,278 |
| Sq. km Mapped by EM 304 in U.S. Waters | 23,766 |
| Vessel CTD Casts | 0 |
| XBT Casts | 86 |
| ROV Dives | 19 |
| ROV Dives in U.S. Waters | 16 |
| Maximum ROV Seafloor Depth (m) | 4,261.5 |
| Minimum ROV Seafloor Depth (m) | 253.1 |
| Total Time on Bottom (hh:mm:ss) | 87:20:56 |
| Water Column Survey Time (hh:mm:ss) | 0 |
| Total ROV Time (hh:mm:ss) | 129:24:47 |
| Potential Undescribed or Novel Species and New Records Observed* | 20 |
| Dives During Which Living Corals and Sponges Were Observed | 17 |
| Dives During Which Chemosynthetic Communities Were Observed | 1 |
| Dives During Which Active Seeps/Vents Were Observed | 1 |
| Dives During Which Diverse Benthic Communities Were Observed | 16 |
| Total Samples | 383 |
| Biological Samples (Primary) | 72 |
| Biological Associate Samples | 197 |
| Geological Samples (Primary) | 32 |
| Geological Associate Samples | 13 |
| eDNA Water Samples | 69 |
| Actively Participating Scientists, Students, and Resource Managers | 50 |

* Organisms unknown to science or an extension of their known range of geolocation or depth

Seascape Alaska 5: Gulf of Alaska Remotely Operated Vehicle Exploration and Mapping was a 23-day telepresence-enabled expedition to collect critical information and acquire data on priority exploration areas identified by the ocean management and scientific communities. This expedition involved exploration of a diversity of features across the Gulf of Alaska, consisting of mapping and remotely operated vehicle (ROV) operations targeting areas with potential to host deep-sea coral and sponge communities, maritime heritage sites, a landslide feature, and water column sonar anomalies of potential cold seeps where gas bubbles emanate from the seafloor. Mapping data

collected during this expedition filled major data gaps in the region and will contribute to the National Ocean Mapping, Exploration and Characterization (NOMEC) strategy, Seascape Alaska, and Seabed 2030 goals for mapping unexplored regions of Earth's oceans. Major accomplishments of this expedition are summarized below.

Nineteen ROV dives ranging in depth from 253 to 4,261 meters were conducted to improve knowledge of unexplored areas within the U.S. Exclusive Economic Zone (EEZ) and in the high seas to inform management needs for sensitive habitats, maritime heritage sites, and potential resources. Data collected can be used to increase understanding of deep-sea ecosystem connectivity across the Pacific basin.

- Collected 269 biological (72 primary and 197 associates), 45 geological specimens, and 69 eDNA water samples.
- Biological specimens were representatives of new records, potential new species, or dominant fauna.
- Geological samples will be used to better understand the geologic history of this region, as well as to characterize habitat substrate.

**Located and characterized deep-sea coral, sponge, and chemosynthetic communities.**

- Documented 16 dive sites with high biological diversity with high biological abundance/density or high biomass.
- Observed deep-sea corals and sponges on every dive except one, which was on a suspected underwater cultural heritage site.
- Conducted one dive that targeted a water column anomaly, revealing a massive and remarkable cold seep community, with giant carbonate rocks providing substrate for a large diversity of fauna. The areas around the bubble sources had vibrant and likely endemic/unique chemosynthetic organisms: specialized snails, clams, and worms, and sponges all likely housing symbiotic bacteria to derive energy from the methane.
- Observed several potential new species, recorded significant depth and geographic range extensions for several fish and coral species, and documented the presence of commercially important species.

**Extended bathymetric mapping coverage in the U.S. EEZ and international waters in support of Seabed 2030.**

- Mapped more 28,600 square kilometers, an area larger than the State of Maryland.
- Fully mapped a number of previously unmapped/poorly mapped seamounts in the Kodiak-Bowie and Patton Seamount Chains.
- Collected critical data on areas on and surrounding the Aleutian Trench, to better understand potential geohazards in the region.

- Identified a number of new methane seeps.

**Collected mapping data and conducted ROV dives to support enhanced predictive capabilities for marine habitats and submarine geohazards.**

- Discovered numerous areas of deep-sea coral and sponge habitat, which has not only improved our understanding of this region, but has habitat modeling implications that may apply to many other places in the world.
- Observed two locations of apparent octopus nurseries (Noyes Canyon and Gumby Ridge), where octopuses were observed brooding over their eggs with juveniles in the vicinity.
- Observed evidence for submarine landslides at a number of different scales and locations. Some examples include the first look at a likely recent event that was possibly related to the deadly 1946 tsunamigenic earthquake, an area of landslides in Behm Canal, the areas of mass-wasting flanks of seamounts, and landslide headwalls and extensive areas of mass-wasting on the walls of Noyes Canyon, less than 10 miles from the Queen Charlotte fault and the epicenter of the 2013 M 7.5 earthquake.
- Explored four seamounts in the Kodiak-Bowie seamount chain, collecting numerous samples for chemical and chronologic studies that will help to understand the origin of these hot spot volcanoes.
- Conducted the first-ever exploration of one of numerous small seamounts of unknown age and origin that form small chains that appear unrelated to the larger seamount chains in the North Pacific.
- Observations are the first to document evidence of nearshore sediments at the summits of several of the Kodiak-Bowie seamounts, demonstrating they once stood above sea level as islands.

Data collected during this expedition is intended to inform initial characterization of the areas visited and includes multibeam, single beam, sub bottom, ADCP, XBT, CTD and dissolved oxygen profiles; surface oceanographic and meteorological sensors; video and imagery; and physical specimens.

## 6.1 Acoustic Operations Results

NOAA Ocean Exploration mapped 28,278 sq. km of seafloor during the 23 days at sea for EX2306. Of the 28,278 sq. km mapped, 23,766 sq. km was deeper than 200 m and within the U.S. Exclusive Economic Zone and Territorial Sea.

Acoustic mapping data are sent to the NOAA archives within 120 days of the end of an expedition. The 2023 mapping readiness report describes the data archived for each dataset, including file formats (Candio et al. 2023). Information about proprietary software and freeware that can handle

the varying data types is in the “NOAA OER Deepwater Exploration Mapping Procedures Manual” (Hoy et al. 2020).

## 6.2 ROV Operations Results

Depth ranges explored during the 19 ROV dives were between 253.1 and 4261.5 m. During these dives, the ROVs spent 87:20:56 hours conducting benthic exploration. **Tables 6 and 7** contain dive-specific information.

**Table 6.** Summary information for the 19 ROV dives conducted during EX2306.

| Dive # | Site Name | Date (yyyymmdd) | On Bottom Latitude (dd) | On Bottom Longitude (dd) | Max Depth (m) | Min Depth (m) | Dive Duration (hh:mm:ss) | Bottom Time (hh:mm:ss) |
|---|---|---|---|---|---|---|---|---|
| 1 | Kodiak Slope | 20230824 | 55.93337° N | -152.91158° W | 3099.2 | 2909.8 | 7:56:33 | 4:32:58 |
| 2 | Kodiak Seep | 20230825 | 56.92286° N | -149.55630° W | 4261.5 | 4252.5 | 7:15:58 | 2:14:37 |
| 3 | Giancomini Seamount | 20230826 | 56.49520° N | -146.31222° W | 898.3 | 733.2 | 7:23:22 | 6:06:06 |
| 4 | Quinn Seamount | 20230827 | 56.35705° N | -145.12580° W | 2022.8 | 1838 | 6:59:17 | 4:29:00 |
| 5 | Surveyor Seamount | 20230828 | 56.09188° N | -144.29735° W | 643.6 | 381 | 8:02:04 | 7:02:04 |
| 6 | Durgin Guyot | 20230829 | 55.80486° N | -141.74431° W | 1270.6 | 1003 | 8:15:28 | 6:34:20 |
| 7 | Deep Discover Dome | 20230830 | 55.01336° N | -140.82667° W | 3289.8 | 3171.6 | 8:09:27 | 4:30:25 |
| 8 | Denson Seamount | 20230831 | 54.13716° N | -137.38143° W | 1458.1 | 1272 | 8:14:16 | 6:22:12 |
| 9 | Ernest Sound | 20230902 | 55.96588° N | -132.07562° W | 546.7 | 253.1 | 8:02:48 | 6:04:01 |
| 10 | Behm Canal | 20230903 | 55.22741° N | -131.08191° W | 577.7 | 375.3 | 3:58:50 | 2:41:37 |
| 11 | Cordova Bay | 20230904 | 54.72511° N | -132.53653° W | 484.8 | 309.7 | 8:02:30 | 7:08:44 |
| 12 | Noyes Canyon | 20230905 | 55.03355° N | -134.52656° W | 1635.2 | 1452 | 8:08:12 | 5:53:10 |
| 13 | Prinsendam | 20230906 | 55.85791° N | -136.47942° W | 2740.5 | 2722.9 | 5:32:45 | 0:49:13 |
| 14 | Chatham Seep | 20230907 | 55.91094° N | -135.49370° W | 2740.5 | 2722.9 | 8:21:00 | 6:51:04 |
| 15 | Middleton Canyon | 20230910 | 59.25006° N | -145.72873° W | 2220.1 | 2010.4 | 7:41:01 | 5:05:50 |
| 16 | Aborted Dive | 20230911 | 60.74814° N | -146.87881° W | 381.4 | n/a | 1:41:42 | n/a |
| 17 | Storey Island | 20230911 | 60.76036° N | -147.37315° W | 396.4 | 358.1 | 2:24:07 | 1:29:17 |
| 18 | Gumby Ridge | 20230912 | 59.07789° N | -147.01322° W | 1868.3 | 1735.3 | 6:55:44 | 4:38:18 |
| 19 | Lone Island | 20230913 | 60.70319° N | -147.69829° W | 645.5 | 476.7 | 6:19:43 | 4:48:00 |

**Table 7.** Summary of scientific metrics for the 19 ROV dives conducted during EX2306.

| Dive # | Site Name | Corals & Sponges | Chemo-synthetic Community | Active Seeps & Vents | Diverse Benthic Community | Primary/ Associate Biological Samples | Primary/ Associate Geological Samples | Water Samples |
|---|---|---|---|---|---|---|---|---|
| 1 | Kodiak Slope | yes | no | no | yes | 4/4 | 2/0 | 5 |
| 2 | Kodiak Seep | yes | no | no | no | 4/1 | 0/2 | 5 |
| 3 | Giancomini Seamount | yes | no | no | yes | 3/16 | 5/0 | 4 |
| 4 | Quinn Seamount | yes | no | no | yes | 2/14 | 5/1 | 4 |
| 5 | Surveyor Seamount | yes | no | no | yes | 7/15 | 3/2 | 3 |
| 6 | Durgin Guyot | yes | no | no | yes | 2/15 | 3/2 | 3 |
| 7 | Deep Discover Dome | yes | no | no | yes | 7/8 | 2/2 | 4 |
| 8 | Denson Seamount | yes | no | no | yes | 7/9 | 3/2 | 3 |
| 9 | Ernest Sound | yes | no | no | yes | 1/5 | 0/0 | 4 |
| 10 | Behm Canal | yes | no | no | yes | 3/0 | 0/0 | 3 |
| 11 | Cordova Bay | yes | no | no | yes | 6/49 | 3/0 | 5 |
| 12 | Noyes Canyon | yes | no | no | yes | 5/8 | 1/0 | 4 |
| 13 | Prinsendam | no | no | no | no | 0/0 | 0/0 | 0 |
| 14 | Chatham Seep | yes | yes | yes | yes | 6/26 | 2/2 | 5 |
| 15 | Middleton Canyon | yes | no | no | yes | 5/3 | 1/0 | 5 |
| 16 | Aborted Dive | no | no | no | no | 0/0 | 0/0 | 0 |
| 17 | Storey Island | yes | no | no | yes | 1/5 | 0/0 | 3 |
| 18 | Gumby Ridge | yes | no | no | yes | 6/3 | 1/0 | 5 |
| 19 | Lone Island | yes | no | no | yes | 3/16 | 2/0 | 4 |

## 6.3 Sampling Operations Results

A total of 383 samples were collected during EX2306: 45 primary geological samples, 72 primary biological samples, 210 associate samples (specimens attached to primary biological or geological

samples), and 69 water samples for eDNA analysis (**Table 7** includes results by dive). **Appendix C** contains complete inventories of geological, biological, and water samples.

There were 32 geological samples that were purposely collected (primary samples) as well as 13 samples that were incidentally collected (associate samples). In total, these samples amounted to 45 individuals. Highlights are noted in Section 6. **Table D1** in **Appendix C** contains full details about the geological samples collected.

There were 72 biological samples that were purposely collected (primary samples) as well as 197 samples that were incidentally collected (associate samples). In total, these samples amounted to 269 individuals. Highlights are noted in Section 6. **Table D2** in **Appendix C** contains full details about the biological samples collected.

There were 69 water samples collected for eDNA analysis. **Table D3** in **Appendix C** contains full details about the water samples collected.

## 6.5 Engagement

EX2306 engaged with audiences around the world, opening a window of understanding into the deep sea. Highlights included:

- 3 live interactions and 20 ship tours were conducted to engage a diversity of audiences. Local Seward community members at the Alaska Sea Life Center as well as students from the BEAMS program at the College of Charleston had the opportunity to engage with the expedition while at sea through live telepresence connections. Once in port, ship tours were given to several organizations and groups including local middle and high school students and their teachers plus homeschoolers, staff from Kenai Fjords National Park, members of the Qutekcak Native Tribe of Seward, leadership and staff from the Alaska Sea Life Center, the Alutiiq Pride Marine Institute, the University of Alaska Seward Marine Center , local National Weather Service staff, local media, and others. These tours provided the opportunity for 200+ individuals to engage first hand with the exploration tools, samples, and expedition team that made EX2306 a success and learn more about ocean exploration and its role in the greater ocean science community.
- Members of the public and onshore scientists alike were able to follow along with the expedition in real time. During the course of the expedition, there were approximately 222,000 livestream views, while web content covering the expedition was viewed over 250,000 times.
- Numerous media and web news outlets around the country and around the world covered the story about the mysterious golden object, including the Washington Post, NPR's All Things Considered, CBS News, Fox News, the BBC, People, Popular Mechanics, and IFL

Science. News aggregators Yahoo and MSN, among others, also picked up the story. Local Alaska media outlets also brought attention to the expedition itself, and the Associated Press released a story about the larger Seascape Alaska campaign that was picked up by a lot of U.S. outlets. All of this coverage amplified the impact of EX2306, increasing the audience reached.

# 7. Data Access

All data collected during NOAA Ocean Exploration expeditions and associated products are made publicly available via the NOAA archives, NOAA's National Centers for Environmental Information (NCEI), the NOAA Institutional Repository, the Smithsonian National Museum of Natural History and Oregon State University sample repositories, unless protected (e.g., data associated with specific maritime heritage sites). Data collected by NOAA must be covered by a data management plan to ensure they are archived and publicly accessible. The data management plan for EX2306 is in the "Project Instructions: EX2306 Seascape Alaska 5: Gulf of Alaska Remotely Operated Vehicle Exploration and Mapping" (Candio, et al. 2023).

The primary tools for accessing data collected during this expedition and archived at NCEI are the NCEI data landing page, the NOAA Ocean Exploration Data Atlas, and the NOAA Ocean Exploration Video Portal. Refer to the NOAA Ocean Exploration Data Access web pages for help navigating expedition data. Other resources include the NOAA Ocean Exploration Data (NCEI) ArcGIS online group, which provides access to all NOAA Ocean Exploration geospatial data services managed by NCEI, including the geospatial data layers found in the data atlas, and the NOAA Ocean Exploration Data Management website.

NCEI makes data publicly available over time as quality-control measures are completed, data are released, and publications and related materials are published. Thus, not all data and products will be made available at the same time. To access data and products from EX2306 that are not yet public, request assistance by submitting a data request form or sending an email to oer.info.mgmt@noaa.gov.

## 7.1 Digital Data/Product Locations

The locations for directly accessing specific types of digital data collected during EX2306 and products documenting expedition results (at the time of writing this report) are provided in **Table 8**.

**Table 8.** Online locations for direct access to digital data collected during EX2306 and products documenting expedition results (at the time of writing this report).

| Data/Product Type | Description |
|---|---|
| EM 304 Bathymetry and Backscatter Data | EM 304 bathymetric and backscatter data, supporting informational logs, and ancillary files are available through NCEI's Bathymetric Data Viewer<br><br>POSPac and BS correction files can be requested from oar.oer.exmappingteam@noaa.gov |
| Water Column Data (EM 304 and EK60/EK80) | EM 304 and EK60/EK80 water column data, supporting data, and informational logs are available through NCEI's Water Column Sonar Data Viewer |
| Knudsen 3260 Sub-Bottom Profiler Data | Sub-bottom data, supporting data, and informational logs are available in NCEI's Trackline Geophysical Data Viewer |
| ADCP Data | ADCP raw data are available through request to oar.oer.exmappingteam@noaa.gov |
| Sound Speed Profiles | Ancillary sound speed profiles are available with the mapping data through NCEI's Bathymetric Data Viewer and the expedition's oceanographic dataset |
| Oceanographic Dataset | Oceanographic data and products are available from NCEI. These data include data from shipboard sensors, including navigational data, meteorological data (wind), and oceanographic data (bathythermograph, sound velocity probe, thermosalinograph); additional data and products include profile data (CTD and XBT), event logs, images, ROV ancillary data, and sample data |
| Sun Photometer Measurements | Sun photometer measurements are available through NASA's Marine Aerosol Network |
| SeaTube Annotations | Annotations from ROV dives with associated video (with a snapshot capability) and geospatial and sensor data are available through Sea Tube |
| Dive Summaries | Individual ROV/AUV dive summaries and associated ROV dive data are available as supplemental files to this report |
| Reports and Papers | Reports and peer-reviewed papers are available through the NOAA Ocean Exploration Library Guide and the NOAA Institutional Repository |

## 7.2 Physical Sample Repositories

The following repositories archive samples collected during NOAA Ocean Exploration expeditions on *Okeanos Explorer*. More information about how to access physical samples is on the NOAA Ocean Exploration website.

### Biological Samples

Department of Invertebrate Zoology

Smithsonian National Museum of Natural History, Museum Support Center
MRC 534, 4210 Silver Hill Road, Suitland, MD 20746

### DNA and eDNA Samples

Biorepository

Smithsonian National Museum of Natural History, Museum Support Center
4210 Silver Hill Road, Suitland, MD 20746

### Geological Samples

Marine and Geology Repository

Oregon State University
Burt 346, Corvallis, OR 97331-5503

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# Appendix A: EX2306 Science Team Members

EX2306 included onboard mission personnel (**Table A1**) as well as shore-based science personnel (**Table A2**) who participated remotely via telepresence.

**Table A1.** EX2306 onboard mission team personnel.

| Name | Role | Affiliation |
|---|---|---|
| Candio, Sam | Expedition Coordinator | NOAA Ocean Exploration |
| Best, Merlin | Science Lead | Department of Fisheries and Oceans, Canada |
| Conrad, Jamie | Science Lead | United States Geological Survey |
| Bittinger, Amanda | Mapping Watch Lead | University Corporation for Atmospheric Research |
| Gillespie, Treyson | Mapping Watch Lead | University Corporation for Atmospheric Research |
| Shantharam, Arvind | Sample Data Manager | National Centers for Environmental Information |
| Murphy, Lars | GFOE Team Lead | Global Foundation for Ocean Exploration |
| Wright, Chris | Engineering Team | Global Foundation for Ocean Exploration |
| Unema, Levi | Engineering Team | Global Foundation for Ocean Exploration |
| Kennison, Sean | Engineering Team | Global Foundation for Ocean Exploration |
| O'Brien, Andy | Engineering Team | Global Foundation for Ocean Exploration |
| Howard, Art | Engineering Team | Global Foundation for Ocean Exploration |
| Bailey, Caitlin | Engineering Team | Global Foundation for Ocean Exploration |
| Mefford, Jon | Engineering Team | Global Foundation for Ocean Exploration |
| Mohr, Bobby | Engineering Team | Global Foundation for Ocean Exploration |
| Gregory, Todd | Engineering Team | Global Foundation for Ocean Exploration |
| Brian, Roland | Engineering Team | Global Foundation for Ocean Exploration |
| Aragon, Fernando | Engineering Team | Global Foundation for Ocean Exploration |
| Kenney, Nate | Engineering Team | Global Foundation for Ocean Exploration |
| Maxon, Amanda | Environmental Compliance Specialist | NOAA Ocean Exploration |
| Ashe, Emily | Science Communication Specialist | NOAA OAR |

| Name | Role | Affiliation |
|---|---|---|
| Hebner, Mitch | Knauss Fellow | NOAA Ocean Exploration |

**Table A2.** EX2306 shore-based science team members who participated via telepresence.

| Name | Role | Affiliation |
|---|---|---|
| Gulbraa, Rachel | Communications Coordinator | NOAA Ocean Exploration |
| Johnson-Rodney, Shellby | Outreach Coordinator | NOAA Ocean Exploration |

# Appendix B: EX2306 Environmental Compliance Documentation

The Endangered Species Act (ESA) Programmatic Letter of Concurrence covering this expedition is attached to this document as a supplement.

The National Environmental Policy Act (NEPA) Categorical Exclusion worksheet is attached to this document as a supplement.

**Figure B1.** EFH Consultation letter

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall Suite 5-100
Sacramento, California 95814

August 3, 2022

**Refer to NMFS No: [WCRO-2022-01863]**

Genene Fisher
Deputy Director
NOAA Office of Ocean Exploration and Research
Silver Spring, Maryland 20910

Re: Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for Deep-Sea Exploration Activities Aboard NOAA Ship *Okeanos Explorer* in 2022-2024

Dear Ms. Fisher:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the NOAA Office of Ocean Exploration and Research's (OER) letter dated July 1, 2022 requesting an abbreviated essential fish habitat (EFH) consultation for the field activities to be conducted aboard the NOAA Ship *Okeanos Explorer* in the West Coast and Alaska Regions in 2022-2024. Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act (FWCA) require federal agencies to consult with us on all actions that may adversely affect EFH and other aquatic resources. The EFH consultation process is guided by the requirements of our EFH regulations at 50 CFR 600 Subpart K, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation process. In support of this consultation process, you provided a notice of the proposed action and your agency's conclusion regarding impacts on EFH. Your request references previously completed EFH consultations between NOAA Fisheries Greater Atlantic and Southeast Regions and OER and NOAA's National Centers of Coastal Ocean Science (NCCOS) for similar research activities conducted in U.S. federal waters of the Gulf of Mexico, South Atlantic Bight and Caribbean in 2018-2020 and activities in the Greater Atlantic Region and Southeast Atlantic from 2019 to 2021. After reviewing the above information, NMFS provides this response pursuant to section 305(b)(4)(A) of the MSA and the FWCA.

Proposed Action

NOAA Ship *Okeanos Explorer* expeditions in 2022 thru 2024 will contribute to the West Coast Expanding Pacific Research and Exploration of Submerged Systems (EXPRESS) campaign and the regional Seascape Alaska campaign. EXPRESS is the latest evolution of the multi-year, multi-ship campaign that will help develop mitigation measures for operations occurring in the region and continued support of marine protected areas. Other initiatives include the Nippon Foundation-GEBCO Seabed 2030 initiative and the National Strategy for Ocean Mapping, Exploring, and Characterizing the United States Exclusive Economic Zone (NOMEC), which looks to produce a bathymetric map of the world ocean floor by 2030.

Consistent with previous expeditions in the Gulf of Mexico, western Atlantic, and Pacific, OER will work with the scientific community and public to characterize unknown and poorly-known areas through telepresence-based exploration including deep water mapping systems. Mapping and remotely operated vehicle (ROV) operations generally occur in water depths of 200 meters (m) and greater. During OER operations, expedition teams would conduct: seafloor, sub-bottom and water column mapping using multibeam, split-beam, sub-bottom profiler and acoustic Doppler current profiler (ADCP) sonar systems; oceanographic data collection primarily using the vessel's CTD rosette and expendable bathythermographs (XBTs); and seafloor and water column data collection using an integrated, two-body ROV system and additional unmanned surface vehicles (USVs) and autonomous underwater

vehicle systems (AUVs). Using ROV and AUV systems during expeditions to visually investigate unknown and poorly known deep water habitats within and around priority areas will help to establish baseline habitat characterization and species inventories for scientists and managers.

**Magnuson-Stevens Fishery Conservation and Management Act Comments**

Action Area and Essential Fish Habitat Affected by the Project

The action areas covered by this request encompass the marine environment in the areas around the North Pacific Ocean, Eastern Pacific Ocean, the Gulf of Alaska (GOA) and the eastern Aleutian Chain, and the vessel transit areas between ports, including but not limited to ports of call located in North America and Pacific Islands. Separate EFH consultations will be submitted for operations located in the Pacific Island Region.

*U.S. West Coast*

OER anticipates spending the majority of the FY2022 and FY2024 field season along the U.S. Pacific Coast contributing to the EXPRESS campaign. This work will also address priorities identified from the 2020 Consortium for Ocean Leadership (COL) workshop. Mapping priorities include filling in the gaps in current mapping coverage deeper than 200 m with high-resolution data offshore of California, Oregon, and Washington, and providing baseline data for further exploration. ROV and AUV exploration priorities are to be determined depending on the needs of ocean resource managers and partners and the ocean science community, and are anticipated to include geological hazards, deep sea corals, seamounts, and critical minerals/seeps. Operations in the Pacific Ocean are expected to commence in October, 2022. The majority of these surveys will take place in the U.S. Exclusive Economic Zone (EEZ) but may deviate in track lines, locations, and timing for various reasons (e.g., crew safety, inclement weather, mechanical issues).

The proposed field activities off the West Coast occur within EFH for various federally managed fish species within the Pacific Coast Groundfish, Pacific Coast Salmon, Coastal Pelagic Species, and Highly Migratory Species Fishery Management Plans (FMPs). In addition, the project would occur within rocky reef and "areas of interest," which are designated as habitat areas of particular concern (HAPC) for various federally managed fish species within the Pacific Coast Groundfish FMP. Although the proposed field activities would occur primarily in deeper waters, the proposed action could occur within the vicinity of other HAPCs identified in the Pacific Coast Groundfish and Pacific Coast Salmon FMPs, including canopy kelp, seagrasses, or estuaries, such as when leaving or returning to ports. HAPC are described in the regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under the MSA; however, federal projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

*Alaska*

NOAA OER's operations in the region during FY2023 will focus on supporting the existing SeaScape Alaska effort. Mapping operation priorities include gaps in mapping coverage deeper than 200 m offshore of the GOA, and the eastern Aleutian chain. ROV and AUV exploration priorities include geological hazards, deep sea corals, seamounts, and critical minerals/seeps. OER plans to conduct operations in Alaskan waters with a concentrated effort in the GOA and the eastern Aleutian Chain. Weather conditions and transit times may impact operations causing exact start and end dates to vary by a few days or weeks expanding the duration of corresponding expeditions. The GOA can be accessible as early as April, and the Aleutians are best from June to September.

The North Pacific Fishery Management Council (NPFMC) has identified EFH for nearshore marine waters in the vicinity of the GOA and the eastern Aleutian Chain to include EFH for all five species of Pacific salmon. There are no anadromous rivers in the project area. The proposed project location is designated as EFH for groundfish and scallops. The proposed field activities off the coast of Alaska occur within EFH for various federally managed fish species within the Bering Sea and Aleutian Islands Groundfish, Gulf of Alaska Groundfish, Scallop, and Salmon FMPs. HAPCs within EFH are areas where fisheries management identifies a need to conserve sensitive, rare habitats from anthropogenic activities such as fishing practices or developmental stress. In order to protect HAPCs, certain habitat protection areas and habitat conservation zones have been designated. The following HAPCs have

been designated in the project area: Alaska Seamount Habitat Protection Areas, GOA Coral Habitat Areas of Particular Concern and Bowers Ridge Habitat Conservation Zone. As noted previously, there are no additional regulatory protections under the MSA for HAPCs; however, federal projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

Effects of the Action

The NMFS West Coast and Alaska Regions have reviewed information provided on the proposed activities, as well as the conservation measures and best management practices incorporated into the action to address adverse effects to EFH. Adverse effects to EFH would include bottom disturbance, increased turbidity, impacts associated with sample collection, and increased sound. However, the proposed action includes measures to avoid, minimize, or otherwise offset those adverse effects to EFH. For instance, to the extent practicable, hard-bottom and other sensitive habitats (e.g., corals, seagrass) would be avoided when anchoring or operating equipment, machinery will maintain an appropriate altitude off the bottom, cameras and other technology will be used to detect and avoid collisions, and speed and the type of equipment used will be adjusted depending upon the environmental conditions. In addition, only portions of specimens will be collected whenever possible to avoid mortality and minimize adverse effects to associated habitats. Increased sound in the marine environment from vessel operation or sonar emissions would only be expected to result in temporary behavioral effects. Therefore, in our joint assessment of the overall activity including the experimental design, the nature of collection, and the scope of the proposed activities, we have no additional EFH conservation recommendations to provide pursuant to Section 305(b)(2) of the MSA.

Supplemental Consultation

Pursuant to 50 CFR 600.920(l), OER must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations.

**Fish and Wildlife Coordination Act Comments**

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development [16 U.S.C. 661]. The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C 662(a)]. Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the MSA.

As described in the EFH effects analysis, NMFS has determined that bottom habitat, potentially including biogenic and rocky reef habitats, will be negatively impacted by proposed project activities. Given the importance of this habitat to a variety of fish and wildlife species, the proposed conservation measures to avoid or minimize adverse effects to EFH are also considered necessary to address negative impacts to fish and wildlife resources managed under the FWCA.

Thank you for consulting with NMFS and considering our comments. If you have any questions regarding this response, please contact Eric Chavez via email at Eric.Chavez@noaa.gov or Charlene Felkley at Charlene.Felkley@noaa.gov for questions related to the West Coast or Alaska, respectively.

Sincerely,

Ryan J. Wulff
Assistant Regional Administrator
for Sustainable Fisheries
West Coast Region

HARRINGTON.GRETCHEN.ANNE.1365893833 Digitally signed by HARRINGTON.GRETCHEN.ANNE.1365893833 Date: 2022.08.04 14:27:22 -08'00'

Gretchen Harrington
Assistant Regional Administrator
for Habitat Conservation
Alaska Region

**Figure B2.** State of Alaska Aquatic Resource Permit

**STATE OF ALASKA**
**DEPARTMENT OF FISH AND GAME**
**P.O. Box 115526**
**JUNEAU, ALASKA 99811-5526**

Permit No. **CF-23-105**

Expires: **9/30/2023**

**AQUATIC RESOURCE PERMIT**
**(For Scientific/Collection Purposes)**

**This permit authorizes:** **Kelley Suhre**
*(whose signature is required on page 2 for permit validation)*
of
**NOAA/Office of Ocean Exploration and Research**
**1315 East Way Hwy., Silver Spring, MD 20910**
**(202)689-4587** kelley.suhre@noaa.gov

to conduct the following activities from **June 20, 2023** to **September 30, 2023** in accordance with AS 16.05.930, AS 16.05.340(b) and 5 AAC 41.600.

**Purpose:** This expedition series is in support of Seascape Alaska to map, explore and characterize the US Exclusive Economic Zone (NOMEC). Data collected will establish a baseline in these areas to catalyze further exploration, research, and management activities.

**Location:** Gulf of Alaska from Southeast Alaska to Unalaska within 3nm and within the US EEZ.

**Species:** See **Species List** on page 2.

**Method of Collection:** Remote operated vehicle on NOAA Ship *Okeanos Explorer*

**Disposition:** Species will be preserved. See **Stipulations** section.

**A COLLECTION REPORT IS DUE October 30, 2023.** See **Stipulations** section for more information. Data from such reports are considered public information. Reports must be submitted to the Alaska Department of Fish and Game, Division of Commercial Fisheries, PO Box 115526, Juneau, AK 99811-5526, attention Permit Coordinator (907-465-4724; dfg.fmpd.permitcoordinator@alaska.gov). A report is required whether or not collecting activities were undertaken.

**GENERAL CONDITIONS, EXCEPTIONS AND RESTRICTIONS**

1. This permit must be carried by person(s) specified during approved activities who shall show it on request to persons authorized to enforce Alaska's fish and game laws. This permit is nontransferable and will be revoked or renewal denied by the Commissioner of Fish and Game if the permittee violates any of its conditions, exceptions or restrictions. No redelegation of authority may be allowed under this permit unless specifically noted.
2. No specimens taken under authority hereof may be sold, bartered, traded, or consumed. All specimens must be deposited in a public museum or a public scientific or educational institution unless otherwise stated herein. Subpermittees shall not retain possession of live animals or other specimens.
3. The permittee shall keep records of all activities conducted under authority of this permit, available for inspection at all reasonable hours upon request of any authorized state enforcement officer.
4. Permits will not be renewed until detailed reports, as specified in the Stipulation section, have been received by the department.
5. UNLESS SPECIFICALLY STATED HEREIN, THIS PERMIT DOES NOT AUTHORIZE the exportation of specimens or the taking of specimens in areas otherwise closed to hunting and fishing; without appropriate licenses required by state regulations; during closed seasons; or in any manner, by any means, at any time not permitted by those regulations.

*Peter Bangs 6/14/2023*
**Assistant Director**
**Division of Commercial Fisheries**

**Authorized Personnel:** The following personnel may participate in collecting activities under terms of this permit:

Sam Candio, Shannon Hoy, Abby Letts, Thomas Morrow, Sam Cuellar, Kelley Suhre and Kasey Cantwell.

*Employees and volunteers under the direct supervision of, and in the presence of, one of the authorized personnel listed above may participate in collecting activities under terms of this permit.*

**CF-23-105** ***continued (page 2 of 2)***

**Stipulations**:

1. Permits will indicate the number of specimens that may be taken by species and life stage. Sampling or collecting activities must stop when the maximum allowable number of specimens is obtained. All live fish, shellfish, and aquatic plants collected in excess of the number specified on the permit must be released immediately and unharmed at the capture location, unless otherwise specified in the permit. All unintended mortalities must be recorded and returned to capture site waters.
2. Up to 2 individuals of each unknown species may be killed and saved for later identification.
3. Specimens collected under the authority of this permit are ONLY to be used for the purposes outlined in this permit.
4. The permit number must be displayed on the holding tanks. All aquarium systems (open and closed) may be inspected by an ADF&G Fish Health Services Pathologist.
5. Destroyed specimens must be double-bagged and placed in a sanitary landfill.
6. A copy of this permit, including any amendments, must be made available at all field collection sites and project sites for inspection upon request by a representative of the department or a law enforcement officer.
7. Issuance of this permit does not absolve the permittee from compliance in full with any and all other applicable federal, state, or local laws regulations, or ordinances.
8. **A report of collecting activities, referencing this aquatic resource permit, must be submitted 30 days after the expiration of this permit.** This report must summarize the number of all specimens, including bycatch, captured by date, location, depth of capture, species, size (weight and length where appropriate), age (where appropriate), sex, numbers, and the fate of those specimens. A report is required whether or not collecting activities were undertaken.
9. **A report of research activities, referencing this aquatic resource permit, must be submitted within 6 months after the expiration of this permit.** This report should present the research conducted in a format similar to a scientific paper including the following: introduction (objective of the study plan and hypothesis), methods, and results. The report is ad-hoc and intended to show that the specimens were used in a scientific method and allows for the evaluation of potential cumulative effects from multiple projects in the same area, but is not intended to be a full peer-reviewed scientific paper.
10. Failure to comply with the conditions of this permit will result in the loss of future permitting privileges.
11. PERMIT VALIDATION requires permittee's signature agreeing to abide by permit conditions before beginning collecting activities:

_____
**Signature of Permittee**

ecc: Ethan Ford, Aaron Dupuis, Kevin Schaberg
CF Division Files
Alaska Wildlife Troopers – Sitka, Seward, Kodiak, Unalaska

| Common Name | Scientific Name | Number |
|---|---|---|
| Black corals | Antipatharia spp. | up to 11 samples per species per location, up to 50 total |
| Black corals | Leiopathes spp. | up to 11 samples per species per location, up to 150 total |
| Black corals | Bathypathes "alternata" | up to 11 samples per species per location, up to 50 total |
| Stony corals | Scleractina spp. | up to 11 samples per species per location, up to 50 total |
| Unknown biological specimens | unknown | up to 11 samples per species per location, up to 100 total |
| Worm | Annelida | up to 11 samples per species per location, up to 150 total |
| Jellyfish | Ctenophora | up to 11 samples per species per location, up to 150 total |
| Starfish, sea urchin, or sea cucumber | Echinoderm | up to 11 samples per species per location, up to 150 total |
| Shellfish | Mollusc | up to 11 samples per species per location, up to 150 total |
| Fishes | Chordata | up to 11 samples per species per location, up to 150 total |
| Corals, sea anemones, jellyfish | Cnidarian | up to 11 samples per species per location, up to 150 total |
| Sponges | Porifera | up to 11 samples per species per location, up to 150 total |
| Worms | Polychaete | up to 11 samples per species per location, up to 150 total |
| Aquatic invertebrates | Bryozoan | up to 11 samples per species per location, up to 150 total |
| ribbed and proboscis worms | Nemertea | up to 11 samples per species per location, up to 150 total |
| Malacostracan crustaceans | Amphipods | up to 11 samples per species per location, up to 150 total |
| Marine chordate animals | Tunicate | up to 11 samples per species per location, up to 150 total |
| Decapods | Crustacean | up to 11 samples per species per location, up to 150 total |
| Slugs and Snails | Gastropod | up to 11 samples per species per location, up to 150 total |

**Figure B3.** U.S. Fish & Wildlife Service Designated Port Exception Permit

Page 1 of 1
DESIGNATED PORT EXCEPTION PERMIT
SCIENTIFIC PURPOSES

**Permit Number: D80153**
Date Effective: 07/13/2023 Date Expires: 07/27/2025

Issuing Office:

Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Office of Law Enforcement
1875 Century Boulevard, Suite 380
Atlanta, GA 30345
Tel: 404-679-7195
Email: permitsEastLE@fws.gov

BRIAN DOWNIE
*Legal Instruments Examiner*
Digitally signed by BRIAN DOWNIE
Date: 2023.07.27 09:21:28 -04'00'

Permittee:
**NOAA OCEAN EXPLORATION**
**1315 EAST-WEST HWY, SSMC3 2300**
**SILVER SPRING, MARYLAND 20910**
**US**

Name and Title of Principal Officer
KASEY CANTWELL - OPERATIONS CHIEF

---

Authority: Statutes and Regulations: 16 USC 1538 (f); 50 CFR SUBPART 13, 50 CFR 14.

**Location where authorized activity may be conducted:**
DH-Dutch Harbor, AK KO-Kona, HI NEWPORT, OREGON KODIAK, ALASKA SEWARD, ALASKA

**Reporting requirements:**
PERMITEE IS REQUIRED TO MAINTAIN RECORDS PER 50 CFR 13.
ACCEPTANCE OF THIS PERMIT AUTHORIZES INSPECTION PER 50 CFR 13.

**Authorizations and Conditions:**

A. General conditions set out in Subpart D of 50 CFR 13, and specific conditions contained in Federal regulations cited above, are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity, or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.
B. The validity of this permit is also conditioned upon strict observance of all applicable foreign, state, local tribal, or other federal law.
C. Valid for use by permittee named above.
D. Permittee is responsible for requesting renewal of permit at least 30 days prior to the expiration date as outlined in 50 CFR 13. Service Law Enforcement Officers will not clear shipments presented for import or export under expired permits.
E. Permittee is authorized to import/export wildlife and/or wildlife products at the port(s) specified above.
F. Permittee must also comply with inspection and clearance procedures as outlined in 50 CFR 14, upon importation/exportation of wildlife and/or wildlife products.
G. Permittee must comply with additional permit conditions as set forth in 50 CFR 14.31.
H. Permittee must contact U.S. Fish & Wildlife Service Officers at least 72 hours prior to the proposed import/export at the following location(s): DH-DUTCH HARBOR, AK - Wildlife Inspector (phone: (907) 271-6198) KO-KONA, HI - Wildlife Inspector (phone: (808) 861-8525) NEWPORT, OREGON - Wildlife Inspector (phone: (206) 241-0191) KODIAK, ALASKA - Wildlife Inspector (phone: (907) 271-6198) SEWARD, ALASKA - Wildlife Inspector (phone: (907) 271-6198).

**Figure B3.** CITES Introduction from the Sea Permit

FORM 3-201A (1/97)

**CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA**

☐ EXPORT PERMIT
☐ RE-EXPORT CERTIFICATE
☒ OTHER CERTIFICATE(see block 9)

Page 1 of 2

1. Original Permit/Certificate No.
23US33698E/9

2. Valid until
2023-09-19

3. Permittee (name and address, country)
NOAA OFFICE OF EXPLORATION AND RESEARCH
1315 EAST WEST HWY
SSMC3, ROOM 10229
SILVER SPRING, MARYLAND 20910
U.S.A.

4. Consignee (name and address, country)
INTRODUCTION FROM THE SEA

5. Special Conditions
ALL APPLICABLE FOREIGN, LOCAL, STATE, OR OTHER FEDERAL LAWS, INCLUDING THOSE REQUIRING PERMITS, MUST BE OBSERVED.

PERMIT MAY BE COPIED FOR MULTIPLE SHIPMENTS. PERMITTEE TO RETAIN ORIGINAL.

PERMITTEE MUST COMPLETE BLOCK(S) 11 (QUANTITY) PRIOR TO EACH SHIPMENT.

DOES NOT AUTHORIZE ACTIVITIES UNDER ESA.

CONDITIONS CONTINUE ON PAGE 2.

THIS REPLACES AND AMENDS 22US33698E/9 ISSUED 2022-09-20.

*For live animals, only valid if the transport conditions comply with the CITES Guidelines for Transport of Live Animals or, in the case of air transport, with IATA Live Animals Regulations.*

5a. Purpose of Transaction
S

6. U.S. Management Authority
Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
DIVISION OF MANAGEMENT AUTHORITY
BRANCH OF PERMITS, MS: IA
5275 LEESBURG PIKE
FALLS CHURCH VA 22041-3803

2023-05-15
Issuing Date

United States Management Authority
AUTHORITY: Endangered Species Act of 1973 (16 USC 1531 et. seq.)

| 7/8. Common Name and Scientific name (genus and species) of Animal or Plant | 9. Description of Part or Derivative, including identifying marks or numbers (age/sex if live) | 10. Appendix No. and Source |
|---|---|---|
| A. Common Name: BLACK CORAL<br>Scientific Name: ANTIPATHARIA | 9. INTRODUCTION FROM THE SEA: FRAGMENT OR BRANCH OF CORAL. | 10. 2 X<br>11. Quantity (including units): NO<br>11a. Total Exported/Quota |

| 12. Country of Origin | Permit/Certificate No. | Date of Issue | 12b. Breeding Operation No. |
|---|---|---|---|
| HIGH SEAS | | | |
| 12a. Country of Last Re-export | Re-export Certificate No. | Date of Issue | 12c. Pre-Convention: Date of Acquisition |
| | | | |

| B. Common Name / Scientific Name | 9. Description of Part or Derivative, including identifying marks or numbers (age/sex if live) | 10. Appendix No. and Source |
|---|---|---|
| B. Common Name: STONY CORAL<br>Scientific Name: SCLERACTINIA | 9. INTRODUCTION FROM THE SEA: FRAGMENT OR BRANCH OF CORAL. | 10. 2 X<br>11. Quantity (including units): NO<br>11a. Total Exported/Quota |

| 12. Country of Origin | Permit/Certificate No. | Date of Issue | 12b. Breeding Operation No. |
|---|---|---|---|
| HIGH SEAS | | | |
| 12a. Country of Last Re-export | Re-export Certificate No. | Date of Issue | 12c. Pre-Convention: Date of Acquisition |
| | | | |

13. Export / Re-export Endorsement:
The official who inspects shipment upon exportation / re-exportation must enter the total quantities of specimens being exported / re-exported in this block.

| See Block 7 | Quantity |
|---|---|
| A | |
| B | |

14. Bill of Lading/Air Way-Bill Number

Port of Exportation / Re-exportation

Total No. of Shipping Containers

15. This document valid only with inspecting official's ORIGINAL stamp, signature and date in this block.

Inspecting Official's Stamp, Signature and Date

SPECIAL PERMIT CONDITIONS

Department of the Interior
U.S. Fish and Wildlife Service
Division of Management Authority
Falls Church, VA 22041
UNITED STATES OF AMERICA



1. Original Permit/Certificate No.
23US33698E/9

5/6. THIS PERMIT IS ISSUED UNDER AUTHORITY OF THE ENDANGERED SPECIES ACT OF 1973 (16 U.S.C. 1531 et seq.) BY:

Falls Church, VA
Place

2023-05-15
Issuing Date

United States Management Authority

**PERMITTEE: NOAA OFFICE OF EXPLORATION AND RESEARCH**

**Special Permit Conditions**

1. Samples collected from coral: Samples collected from coral may be brought into the United States under this Introduction from the Sea (IFS) certificate provided the conditions of 2 through 6 are met.

2. No samples may be obtained from coral that are permanently removed from the wild for the sole purpose of collecting samples, or for other than scientific or management purposes approved and carried out by appropriate wildlife authorities.

3. No coral colony may be killed intentionally for the purpose of collecting samples.

4. Care must be taken when handling live coral colonies to minimize any possibility of injury. If, for any reason, any wild or captive-held coral colony dies or incurs a debilitating injury solely as a result of being restrained for sample collection, or while having the sample collected, further collection of samples must be suspended until methods are evaluated and, if appropriate, modified to prevent further incidences of injury or death. If two or more coral colonies die or incur debilitating injuries within a 6-month period, sample collection must be suspended and the Division of Scientific Authority contacted in writing within 7 days of the death of the second individual. Before further sampling will be authorized a written account of the details of the event, and recommendations to resolve the situation, must be submitted for a review of sampling procedures (point of contact: Dr. Rosemarie Gnam, Chief, Division of Scientific Authority, MS: IA, 5275 Leesburg Pike, Falls Church, VA 22041-3803; tel. 703-358-1708; fax 703-358-2276).

5. The applicant must maintain a record of all samples collected under this certificate which must be made available to the Division of Scientific Authority upon request. This record should include for each introduction from the sea: the species and type(s) of specimens, date(s) collected, the date shipped, the location(s) of collection and name of person who collected the sample(s), conditions under which samples were collected (salvage or wild-caught), authorizing government agency, and any mortalities or debilitating injuries that may have occurred as a result, directly or indirectly, of the collection activities.

6. The applicant must maintain copies of all CITES certificates used to obtain and introduce from the sea all specimens and these documents must be made available to the Division of Scientific Authority upon request.

15. EXPORT/RE-EXPORT/IMPORT ENDORSEMENT: I, the inspecting official, certify that the information provided above is accurate. This document is valid only with inspecting official's ORIGINAL stamp, signature and date in this block.

Inspecting Official's Stamp, Signature and Date

# Appendix C: Inventories of Geological, Biological, and eDNA Water Samples

**Tables D1-D3** provide inventories of the geological, biological, and water samples for eDNA analysis collected during EX2306. Detailed sample inventories are available from the NCEI archive via the Ocean Exploration Data Atlas: https://www.ncei.noaa.gov/maps/ocean-exploration-data-atlas/

**Table D1.** Inventory of geological samples collected during EX2306.

| Dive # | Site Name | Sample #* | Sample ID | Preser-vation | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Kodiak Shelf | EX2306_D01_02G | Siltstone | Dried | Geology | 20230824 | 200001 | 55.92992 | -152.918692 | 3079.512939 | 0.0120000001 |
| 1 | Kodiak Shelf | EX2306_D01_10G | Mudstone | Dried | Geology | 20230824 | 200000 | 55.92992 | -152.918692 | 3079.512939 | 0.04500000179 |
| 2 | Kodiak Seep | EX2306_D02_01B_A01G | seafloor sediment | Frozen | Geology | 20230825 | 210114 | 56.923144 | -149.556321 | 4255.120117 | 0.07999999821 |
| 2 | Kodiak Seep | EX2306_D02_03B_A01G | Seafloor sediment | Frozen | Geology | 20230825 | 214548 | 56.923869 | -149.556268 | 4260.319824 | 0.06499999762 |
| 3 | Giacomini Seamount | EX2306_D03_02G | Basalt | Dried | Geology | 20230826 | 174132 | 56.492332 | -146.311833 | 895.5419922 | 1.00999999 |
| 3 | Giacomini Seamount | EX2306_D03_08G | Basalt | Dried | Geology | 20230826 | 200525 | 56.491464 | -146.313989 | 816.4290161 | 1.559999943 |
| 3 | Giacomini Seamount | EX2306_D03_09G | pebble conglomerate | Dried | Geology | 20230826 | 210040 | 56.490902 | -146.315188 | 786.8720093 | 0.3899999857 |
| 3 | Giacomini Seamount | EX2306_D03_10G | basalt | Dried | Geology | 20230826 | 225529 | 56.489349 | -146.318952 | 736.5579834 | 2.25999999 |
| 3 | Giacomini Seamount | EX2306_D03_11G | pebbly sand | Dried | Geology | 20230826 | 230339 | 56.489351 | -146.318871 | 736.7990112 | 0.0549999997 |
| 4 | Quinn Seamount | EX2306_D04_02G | 2 basalt cobbles | Dried | Geology | 20230827 | 202640 | 56.354325 | -145.132368 | 1992.953979 | 1.279999971 |
| 4 | Quinn Seamount | EX2306_D04_04G | basalt | Dried | Geology | 20230827 | 213400 | 56.354656 | -145.134131 | 1946.509033 | n/a |
| 4 | Quinn Seamount | EX2306_D04_05G | yellow crust | Dried | Geology | 20230827 | 220416 | 56.354539 | -145.135323 | 1908.219971 | 0.0750000298 |

| Dive # | Site Name | Sample #* | Sample ID | Preser-vation | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Quinn Seamount | EX2306_D04_06G | basalt with barnacles+1 smaller rock | Dried | Geology | 20230827 | 222935 | 56.354576 | -145.13556 | 1902.339966 | 5.5 |
| 4 | Quinn Seamount | EX2306_D04_08B _A03G | basalt | Dried | Geology | 20230827 | 231325 | 56.35425 | -145.136925 | 1858.92395 | 2.039999 962 |
| 5 | Surveyor Seamount | EX2306_D05_02G | basalt | Dried | Geology | 20230828 | 175813 | 56.090772 | -144.298715 | 633.0770264 | 0.219999 9988 |
| 5 | Surveyor Seamount | EX2306_D05_04G | pebbly sediment | Dried | Geology | 20230828 | 180542 | 56.090776 | -144.298722 | 633.2940063 | 0.068999 99827 |
| 5 | Surveyor Seamount | EX2306_D05_10G | basalt w/ sponge | Dried | Geology | 20230828 | 214314 | 56.088277 | -144.302254 | 491.6849976 | 1.309999 943 |
| 5 | Surveyor Seamount | EX2306_D05_05B _A03G | basalt | Dried | Geology | 20230828 | 193049 | 56.090012 | -144.300384 | 595.223999 | 1.549999 952 |
| 5 | Surveyor Seamount | EX2306_D05_11B _A02G | BASALTIC CINDERS | Dried | Geology | 20230828 | 232209 | 56.086772 | -144.305021 | 407.4230042 | 0.002000 000095 |
| 6 | Durgin Guyot | EX2306_D06_02G | basalt | Dried | Geology | 20230829 | 173557 | 55.806379 | -141.746176 | 1269.52002 | n/a |
| 6 | Durgin Guyot | EX2306_D06_03G | basalt 2 pieces | Dried | Geology | 20230829 | 203344 | 55.806478 | -141.747604 | 1151.456055 | n/a |
| 6 | Durgin Guyot | EX2306_D06_05G | Pebbly sandstone | Dried | Geology | 20230829 | 222758 | 55.806855 | -141.749641 | 1067.56897 | n/a |
| 6 | Durgin Guyot | EX2306_D06_05G _A03G | Fine sand with pebbles | Dried | Geology | 20230829 | 222758 | 55.806855 | -141.749641 | 1067.56897 | n/a |
| 6 | Durgin Guyot | EX2306_D06_06B _A09G | Pebbly sand | Dried | Geology | 20230829 | 224318 | 55.806828 | -141.749785 | 1061.890015 | n/a |
| 7 | Deep Discover Dome | EX2306_D07_02G | Basalt | Dried | Geology | 20230830 | 191204 | 55.013238 | -140.832591 | 3275.727051 | 4.360000 134 |
| 7 | Deep Discover Dome | EX2306_D07_10G | Basalt w/ Fe-Mn crust | Dried | Geology | 20230830 | 222733 | 55.011749 | -140.834985 | 3177.954102 | 2.529999 971 |
| 7 | Deep Discover Dome | EX2306_D07_11B _A02G | basalt | Dried | Geology | 20230830 | 223045 | 55.011774 | -140.8351 | 3178.37793 | 0.860000 0143 |

| Dive # | Site Name | Sample #* | Sample ID | Preser-vation | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | Deep Discover Dome | EX2306_D07_11B_A06G | basalt sand | Dried | Geology | 20230830 | 223045 | 55.011774 | -140.8351 | 3178.37793 | 0.003000000026 |
| 8 | Denson Seamount | EX2306_D08_04G | Basalt | Dried | Geology | 20230831 | 184504 | 54.137923 | -137.380107 | 1420.435059 | 1.24000001 |
| 8 | Denson Seamount | EX2306_D08_08G | pebbly sediment | Dried | Geology | 20230831 | 222355 | 54.135704 | -137.383816 | 1283.706055 | 0.125 |
| 8 | Denson Seamount | EX2306_D08_11G | Mn crust on basalt with sponge + | Dried | Geology | 20230831 | 233336 | 54.1353 | -137.385175 | 1273.546021 | 2.299999952 |
| 8 | Denson Seamount | EX2306_D08_07B_A01G | basalt cobbles | Dried | Geology | 20230831 | 214213 | 54.136152 | -137.382816 | 1290.91394 | 0.094999999881 |
| 8 | Denson Seamount | EX2306_D08_10B_A03G | basalt | 95% EtOH | Geology | 20230831 | 232500 | 54.135243 | -137.385312 | 1274.253052 | 4.349999905 |
| 11 | Cordova Bay | EX2306_D11_02G | volcanic rock w/ encrusting bio | Dried | Geology | 20230904 | 184518 | 54.72336 | -132.537856 | 406.6459961 | 0.8899999857 |
| 11 | Cordova Bay | EX2306_D11_07G | Metavolcanic Schist | Dried | Geology | 20230904 | 210208 | 54.722426 | -132.538079 | 333.2070007 | 1.299999952 |
| 11 | Cordova Bay | EX2306_D11_12G | metavolcanic schist? | Dried | Geology | 20230904 | 233423 | 54.722645 | -132.540189 | 320.9869995 | 6.300000191 |
| 12 | Noyes Canyon | EX2306_D12_03G | mud/mudstone | Dried | Geology | 20230905 | 192254 | 55.032097 | -134.518921 | 1598.345947 | 0.5299999714 |
| 14 | Chatham Seep | EX2306_D14_03G | Authigenic carbonate | Dried | Geology | 20230907 | 202234 | 55.910076 | -135.4992 | 705.1820068 | 0.6299999952 |
| 14 | Chatham Seep | EX2306_D14_11G | Unknown rock | Dried | Geology | 20230907 | 235849 | 55.910978 | -135.496959 | 707.1149902 | 0.5400000215 |
| 14 | Chatham Seep | EX2306_D14_01B_A06G | volcanic rock with carbonate crust | Dried | Geology | 20230907 | 201004 | 55.91011 | -135.49912 | 705.2609863 | n/a |

| Dive # | Site Name | Sample #* | Sample ID | Preser-vation | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Chatham Seep | EX2306_D14_07B _A11G | pebble and cobbles with authigenic carbonate cement | Dried | Geology | 20230907 | 223441 | 55.910444 | -135.498809 | 705.2329712 | n/a |
| 15 | Middleton Canyon | EX2306_D15_05G | Mudstone | Dried | Geology | 20230910 | 212159 | 59.248781 | -145.71385 | 2121.870117 | 0.1199999973 |
| 18 | Gumby Ridge | EX2306_D18_09G | Mudstone | Dried | Geology | 20230912 | 215520 | 59.073305 | -147.01174 | 1768.279053 | 0.2300000042 |
| 19 | Lone Island | EX2306_D19_05G | Basalt | Dried | Geology | 20230913 | 211201 | 60.702365 | -147.699778 | 579.8660278 | 3.50999999 |
| 19 | Lone Island | EX2306_D19_08G | Basalt | Dried | Geology | 20230914 | 000307 | 60.702584 | -147.703509 | 478.151001 | 1.460000038 |

* Geological sample numbers with "_A##" indicate associate samples.

**Table D2.** Inventory of biological samples collected during EX2306.

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Kodiak Shelf | EX2306_D01_01B_A01B | Ophiuroidea | 95% EtOH | n/a | 20230824 | 191213 | 55.930343 | -152.918521 | 3,092.28 | 34.649 | 1.570 | 3.547 |
| 1 | Kodiak Shelf | EX2306_D01_02G_A01B | Ophiuroidea | 95% EtOH | n/a | 20230824 | 200001 | 55.92992 | -152.918692 | 3,079.51 | 34.652 | 1.561 | 3.495 |
| 1 | Kodiak Shelf | EX2306_D01_02G_A02B | Amphipoda | 95% EtOH | n/a | 20230824 | 200001 | 55.92992 | -152.918692 | 3,079.51 | 34.652 | 1.561 | 3.495 |
| 1 | Kodiak Shelf | EX2306_D01_01B | Caulophacus | 95% EtOH | Rare Fauna | 20230824 | 191213 | 55.930343 | -152.918521 | 3,092.28 | 34.649 | 1.570 | 3.547 |
| 1 | Kodiak Shelf | EX2306_D01_03B | Bathypathes | 95% EtOH | Characteristic of Site | 20230824 | 202126 | 55.929863 | -152.918702 | 3,072.49 | 34.653 | 1.567 | 3.452 |
| 1 | Kodiak Shelf | EX2306_D01_04B | Kophoblemnon | 95% EtOH | Rare Fauna | 20230824 | 203911 | 55.929591 | -152.91906 | 3,056.30 | 34.651 | 1.569 | 3.486 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Kodiak Shelf | EX2306_D01_05B | Urechinus | 95% EtOH | Rare Fauna | 20230824 | 212438 | 55.928809 | -152.918974 | 3,022.47 | 34.653 | 1.538 | 3.495 |
| 1 | Kodiak Shelf | EX2306_D01_05B_A01B | Amphipoda | 95% EtOH | n/a | 20230824 | 212438 | 55.928809 | -152.918974 | 3,022.47 | 34.653 | 1.538 | 3.495 |
| 2 | Kodiak Seep | EX2306_D02_01B | Pennatulacea | 95% EtOH | Rare Fauna | 20230825 | 210114 | 56.923144 | -149.556321 | 4,255.12 | 34.678 | 1.491 | 4.503 |
| 2 | Kodiak Seep | EX2306_D02_02B | Cystechinus | 95% EtOH | Rare Fauna | 20230825 | 213355 | 56.923989 | -149.556121 | 4,258.74 | 34.681 | 1.467 | 4.569 |
| 2 | Kodiak Seep | EX2306_D02_03B | Pennatula | 95% EtOH | Rare Fauna | 20230825 | 214548 | 56.923869 | -149.556268 | 4,260.32 | 34.680 | 1.456 | 4.579 |
| 2 | Kodiak Seep | EX2306_D02_04B | Actinaria | 95% EtOH | Rare Fauna | 20230825 | 215509 | 56.924237 | -149.555505 | 4,260.19 | 34.680 | 1.456 | 4.476 |
| 2 | Kodiak Seep | EX2306_D02_01B_A02B | Ophiuroidea | 95% EtOH | n/a | 20230825 | 210114 | 56.923144 | -149.556321 | 4,255.12 | 34.678 | 1.491 | 4.503 |
| 3 | Giacomini Seamount | EX2306_D03_03B | Anthoptilum cf. lithophilim | 95% EtOH | Rare Fauna | 20230826 | 175629 | 56.492223 | -146.311879 | 894.67 | 34.355 | 2.979 | 0.536 |
| 3 | Giacomini Seamount | EX2306_D03_05B | Coralliidae | 95% EtOH | Rare Fauna | 20230826 | 191657 | 56.491855 | -146.313129 | 849.61 | 34.336 | 3.078 | 0.502 |
| 3 | Giacomini Seamount | EX2306_D03_07B | Asthenactis | 95% EtOH | Potential Undescribed Species | 20230826 | 200149 | 56.491381 | -146.313831 | 816.67 | 34.338 | 3.060 | 0.506 |
| 3 | Giacomini Seamount | EX2306_D03_02G_A01B | Octocorallia | 95% EtOH | n/a | 20230826 | 174132 | 56.492332 | -146.311833 | 895.54 | 34.350 | 3.000 | 0.541 |
| 3 | Giacomini Seamount | EX2306_D03_08G_A01B | Hydroida | 95% EtOH | n/a | 20230826 | 200525 | 56.491464 | -146.313989 | 816.43 | 34.333 | 3.059 | 0.534 |
| 3 | Giacomini Seamount | EX2306_D03_08G_A02B | Serpulidae | 95% EtOH | n/a | 20230826 | 200525 | 56.491464 | -146.313989 | 816.43 | 34.333 | 3.059 | 0.534 |
| 3 | Giacomini Seamount | EX2306_D03_08G_A03B | Porifera | | n/a | 20230826 | 200525 | 56.491464 | -146.313989 | 816.43 | 34.333 | 3.059 | 0.534 |
| 3 | Giacomini Seamount | EX2306_D03_08G_A04B | Coralliidae | 95% EtOH | n/a | 20230826 | 200525 | 56.491464 | -146.313989 | 816.43 | 34.333 | 3.059 | 0.534 |
| 3 | Giacomini Seamount | EX2306_D03_08G_A05B | Miscellaneous | 95% EtOH | n/a | 20230826 | 200525 | 56.491464 | -146.313989 | 816.43 | 34.333 | 3.059 | 0.534 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | Giacomini Seamount | EX2306_D03_09G_A01B | Ophiuroidea | 95% EtOH | n/a | 20230826 | 210040 | 56.490902 | -146.315188 | 786.87 | 34.306 | 3.200 | 0.522 |
| 3 | Giacomini Seamount | EX2306_D03_09G_A02B | Porifera | 95% EtOH | n/a | 20230826 | 210040 | 56.490902 | -146.315188 | 786.87 | 34.306 | 3.200 | 0.522 |
| 3 | Giacomini Seamount | EX2306_D03_09G_A03B | Coralliidae | 95% EtOH | n/a | 20230826 | 210040 | 56.490902 | -146.315188 | 786.87 | 34.306 | 3.200 | 0.522 |
| 3 | Giacomini Seamount | EX2306_D03_09G_A04B | Polychaeta | 95% EtOH | n/a | 20230826 | 210040 | 56.490902 | -146.315188 | 786.87 | 34.306 | 3.200 | 0.522 |
| 3 | Giacomini Seamount | EX2306_D03_10G_A01B | Bryozoa | 95% EtOH | n/a | 20230826 | 225529 | 56.489349 | -146.318952 | 736.56 | 34.296 | 3.231 | 0.517 |
| 3 | Giacomini Seamount | EX2306_D03_10G_A03B | hydrozoa | 95% EtOH | n/a | 20230826 | 225529 | 56.489349 | -146.318952 | 736.56 | 34.296 | 3.231 | 0.517 |
| 3 | Giacomini Seamount | EX2306_D03_10G_A04B | Porifera | 95% EtOH | n/a | 20230826 | 225529 | 56.489349 | -146.318952 | 736.56 | 34.296 | 3.231 | 0.517 |
| 3 | Giacomini Seamount | EX2306_D03_10G_A05B | Polychaeta | 95% EtOH | n/a | 20230826 | 225529 | 56.489349 | -146.318952 | 736.56 | 34.296 | 3.231 | 0.517 |
| 3 | Giacomini Seamount | EX2306_D03_10G_A06B | | 95% EtOH | n/a | 20230826 | 225529 | 56.489349 | -146.318952 | 736.56 | 34.296 | 3.231 | 0.517 |
| 3 | Giacomini Seamount | EX2306_D03_10G_A07B | miscellaneous | 95% EtOH | n/a | 20230826 | 225529 | 56.489349 | -146.318952 | 736.56 | 34.296 | 3.231 | 0.517 |
| 4 | Quinn Seamount | EX2306_D04_03B | crinoidea | 95% EtOH | Rare Fauna | 20230827 | 211500 | 56.354487 | -145.133744 | 1,954.73 | 34.575 | 1.958 | 1.744 |
| 4 | Quinn Seamount | EX2306_D04_08B | Anthomastus | 95% EtOH | Rare Fauna | 20230827 | 231325 | 56.35425 | -145.136925 | 1,858.92 | 34.560 | 2.013 | 1.527 |
| 4 | Quinn Seamount | EX2306_D04_02G_A01B | Porifera | 95% EtOH | n/a | 20230827 | 202640 | 56.354325 | -145.132368 | 1,992.95 | 34.575 | 1.944 | 1.779 |
| 4 | Quinn Seamount | EX2306_D04_02G_A02B | Hydrozoa | 95% EtOH | n/a | 20230827 | 202640 | 56.354325 | -145.132368 | 1,992.95 | 34.575 | 1.944 | 1.779 |
| 4 | Quinn Seamount | EX2306_D04_04G_A01B | Cirripedia | 95% EtOH | n/a | 20230827 | 213400 | 56.354656 | -145.134131 | 1,946.51 | 34.571 | 1.954 | 1.739 |
| 4 | Quinn Seamount | EX2306_D04_04G_A02B | Porifera | 95% EtOH | n/a | 20230827 | 213400 | 56.354656 | -145.134131 | 1,946.51 | 34.571 | 1.954 | 1.739 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Quinn Seamount | EX2306_D04_04G_A03B | Serpulidae | 95% EtOH | n/a | 20230827 | 213400 | 56.354656 | -145.134131 | 1,946.51 | 34.571 | 1.954 | 1.739 |
| 4 | Quinn Seamount | EX2306_D04_04G_A04B | Zoantharia | 95% EtOH | n/a | 20230827 | 213400 | 56.354656 | -145.134131 | 1,946.51 | 34.571 | 1.954 | 1.739 |
| 4 | Quinn Seamount | EX2306_D04_04G_A05B | | 95% EtOH | n/a | 20230827 | 213400 | 56.354656 | -145.134131 | 1,946.51 | 34.571 | 1.954 | 1.739 |
| 4 | Quinn Seamount | EX2306_D04_06G_A01B | Cirripedia | 95% EtOH | n/a | 20230827 | 222935 | 56.354576 | -145.13556 | 1,902.34 | 34.566 | 2.004 | 1.571 |
| 4 | Quinn Seamount | EX2306_D04_06G_A02B | Anthozoa | 95% EtOH | n/a | 20230827 | 222935 | 56.354576 | -145.13556 | 1,902.34 | 34.566 | 2.004 | 1.571 |
| 4 | Quinn Seamount | EX2306_D04_06G_A03B | Zoantharia | 95% EtOH | n/a | 20230827 | 222935 | 56.354576 | -145.13556 | 1,902.34 | 34.566 | 2.004 | 1.571 |
| 4 | Quinn Seamount | EX2306_D04_08B_A01B | Serpulidae | 95% EtOH | n/a | 20230827 | 231325 | 56.35425 | -145.136925 | 1,858.92 | 34.560 | 2.013 | 1.527 |
| 4 | Quinn Seamount | EX2306_D04_08B_A02B | Pectinidae | 95% EtOH | n/a | 20230827 | 231325 | 56.35425 | -145.136925 | 1,858.92 | 34.560 | 2.013 | 1.527 |
| 4 | Quinn Seamount | EX2306_D04_08B_A04B | Nudibranchia | 95% EtOH | n/a | 20230827 | 231325 | 56.35425 | -145.136925 | 1,858.92 | 34.560 | 2.013 | 1.527 |
| 4 | Quinn Seamount | EX2306_D04_08B_A05B | Ophiuroidea | 95% EtOH | n/a | 20230827 | 231325 | 56.35425 | -145.136925 | 1,858.92 | 34.560 | 2.013 | 1.527 |
| 5 | Surveyor Seamount | EX2306_D05_03B | ASTEROIDEA | 95% EtOH | Rare Fauna | 20230828 | 180237 | 56.090789 | -144.298725 | 633.04 | 34.167 | 3.733 | 0.610 |
| 5 | Surveyor Seamount | EX2306_D05_05B | Stolonifera | 95% EtOH | Rare Fauna | 20230828 | 193049 | 56.090012 | -144.300384 | 595.22 | 34.168 | 3.731 | 0.632 |
| 5 | Surveyor Seamount | EX2306_D05_06B | PARAGORGIA | 95% EtOH | Rare Fauna | 20230828 | 194116 | 56.090057 | -144.300469 | 594.71 | 34.167 | 3.734 | 0.599 |
| 5 | Surveyor Seamount | EX2306_D05_07B | PRIMNOA PACIFICA | 95% EtOH | Rare Fauna | 20230828 | 211753 | 56.088591 | -144.301877 | 496.46 | 34.144 | 3.742 | 0.619 |
| 5 | Surveyor Seamount | EX2306_D05_08B | Keratoisidae | 95% EtOH | Rare Fauna | 20230828 | 212612 | 56.088616 | -144.301892 | 497.57 | 34.147 | 3.737 | 0.630 |
| 5 | Surveyor Seamount | EX2306_D05_11B | OTHER | 95% EtOH | Rare Fauna | 20230828 | 232209 | 56.086772 | -144.305021 | 407.42 | 34.085 | 3.888 | 0.738 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | Surveyor Seamount | EX2306_D05_13B | porifera | 95% EtOH | Rare Fauna | 20230828 | 235816 | 56.086493 | -144.305567 | 381.24 | 34.081 | 3.896 | 0.759 |
| 5 | Surveyor Seamount | EX2306_D05_03B_A01B | Ophiuroidea | 95% EtOH | n/a | 20230828 | 180237 | 56.090789 | -144.298725 | 633.04 | 34.167 | 3.733 | 0.610 |
| 5 | Surveyor Seamount | EX2306_D05_04G_A01B | Ophiuroidea | 95% EtOH | n/a | 20230828 | 180542 | 56.090776 | -144.298722 | 633.29 | 34.167 | 3.733 | 0.626 |
| 5 | Surveyor Seamount | EX2306_D05_05B_A01B | Pectinidae | 95% EtOH | n/a | 20230828 | 193049 | 56.090012 | -144.300384 | 595.22 | 34.168 | 3.731 | 0.632 |
| 5 | Surveyor Seamount | EX2306_D05_05B_A02B | Ophiuroidea | 95% EtOH | n/a | 20230828 | 193049 | 56.090012 | -144.300384 | 595.22 | 34.168 | 3.731 | 0.632 |
| 5 | Surveyor Seamount | EX2306_D05_06B_A01B | Ophiuroidea | 95% EtOH | n/a | 20230828 | 194116 | 56.090057 | -144.300469 | 594.71 | 34.167 | 3.734 | 0.599 |
| 5 | Surveyor Seamount | EX2306_D05_07B_A01B | Ophiuroidea | 95% EtOH | n/a | 20230828 | 211753 | 56.088591 | -144.301877 | 496.46 | 34.144 | 3.742 | 0.619 |
| 5 | Surveyor Seamount | EX2306_D05_10G_A01B | Porifera | 95% EtOH | n/a | 20230828 | 214314 | 56.088277 | -144.302254 | 491.68 | 34.155 | 3.733 | 0.621 |
| 5 | Surveyor Seamount | EX2306_D05_10G_A02B | Ophiuroidea | 95% EtOH | n/a | 20230828 | 214314 | 56.088277 | -144.302254 | 491.68 | 34.155 | 3.733 | 0.621 |
| 5 | Surveyor Seamount | EX2306_D05_10G_A03B | Serpulidae | 95% EtOH | n/a | 20230828 | 214314 | 56.088277 | -144.302254 | 491.68 | 34.155 | 3.733 | 0.621 |
| 5 | Surveyor Seamount | EX2306_D05_11B_A01B | Cladorhizidae | 95% EtOH | n/a | 20230828 | 232209 | 56.086772 | -144.305021 | 407.42 | 34.085 | 3.888 | 0.738 |
| 5 | Surveyor Seamount | EX2306_D05_13B_A01B | Nudibranchia | 95% EtOH | n/a | 20230828 | 235816 | 56.086493 | -144.305567 | 381.24 | 34.081 | 3.896 | 0.759 |
| 5 | Surveyor Seamount | EX2306_D05_13B_A02B | Hydrozoa | 95% EtOH | n/a | 20230828 | 235816 | 56.086493 | -144.305567 | 381.24 | 34.081 | 3.896 | 0.759 |
| 5 | Surveyor Seamount | EX2306_D05_13B_A03B | Amphipoda | 95% EtOH | n/a | 20230828 | 235816 | 56.086493 | -144.305567 | 381.24 | 34.081 | 3.896 | 0.759 |
| 5 | Surveyor Seamount | EX2306_D05_13B_A04B | miscellaneous | 95% EtOH | n/a | 20230828 | 235816 | 56.086493 | -144.305567 | 381.24 | 34.081 | 3.896 | 0.759 |
| 5 | Surveyor Seamount | EX2306_D05_13B_A05B | Caprellidea | 95% EtOH | n/a | 20230828 | 235816 | 56.086493 | -144.305567 | 381.24 | 34.081 | 3.896 | 0.759 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Durgin Guyot | EX2306_D06_04B | Hexactinellida | 95% EtOH | Rare Fauna | 20230829 | 221856 | 55.806861 | -141.749631 | 1,066.42 | 34.375 | 2.939 | 0.496 |
| 6 | Durgin Guyot | EX2306_D06_06B | Limidae | 10% Formalin | Rare Fauna | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |
| 6 | Durgin Guyot | EX2306_D06_02G_A01B | Onuphidae | 95% EtOH | n/a | 20230829 | 173557 | 55.806379 | -141.746176 | 1,269.52 | 34.435 | 2.610 | 0.624 |
| 6 | Durgin Guyot | EX2306_D06_02G_A02B | Ophiuroidea | 95% EtOH | n/a | 20230829 | 173557 | 55.806379 | -141.746176 | 1,269.52 | 34.435 | 2.610 | 0.624 |
| 6 | Durgin Guyot | EX2306_D06_02G_A03B | | 95% EtOH | n/a | 20230829 | 173557 | 55.806379 | -141.746176 | 1,269.52 | 34.435 | 2.610 | 0.624 |
| 6 | Durgin Guyot | EX2306_D06_03G_A01B | Porifera | Dried | n/a | 20230829 | 203344 | 55.806478 | -141.747604 | 1,151.46 | 34.390 | 2.855 | 0.524 |
| 6 | Durgin Guyot | EX2306_D06_03G_A02B | PORIFERA | 95% EtOH | n/a | 20230829 | 203344 | 55.806478 | -141.747604 | 1,151.46 | 34.390 | 2.855 | 0.524 |
| 6 | Durgin Guyot | EX2306_D06_03G_A03B | Miscellaneous | 95% EtOH | n/a | 20230829 | 203344 | 55.806478 | -141.747604 | 1,151.46 | 34.390 | 2.855 | 0.524 |
| 6 | Durgin Guyot | EX2306_D06_05G_A01B | Ophiuroidea | 95% EtOH | n/a | 20230829 | 222758 | 55.806855 | -141.749641 | 1,067.57 | 34.386 | 2.869 | 0.513 |
| 6 | Durgin Guyot | EX2306_D06_06B_A01B | Ampharetidae | 95% EtOH | n/a | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |
| 6 | Durgin Guyot | EX2306_D06_06B_A02B | Ophiuroidea | 95% EtOH | n/a | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |
| 6 | Durgin Guyot | EX2306_D06_06B_A03B | Demospongiae | 95% EtOH | n/a | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |
| 6 | Durgin Guyot | EX2306_D06_06B_A04B | Porifera | 95% EtOH | n/a | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |
| 6 | Durgin Guyot | EX2306_D06_06B_A05B | Hexactinellida | Dried | n/a | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |
| 6 | Durgin Guyot | EX2306_D06_06B_A06B | Pectinida | 95% EtOH | n/a | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |
| 6 | Durgin Guyot | EX2306_D06_06B_A07B | Polychaeta | 95% EtOH | n/a | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | Durgin Guyot | EX2306_D06_06B_A08B | Miscellaneous | 95% EtOH | n/a | 20230829 | 224318 | 55.806828 | -141.749785 | 1,061.89 | 34.385 | 2.862 | 0.548 |
| 7 | Deep Discover Dome | EX2306_D07_03B | Primnoidae | 95% EtOH | Rare Fauna | 20230830 | 192835 | 55.013255 | -140.832904 | 3,266.11 | 34.659 | 1.547 | 3.568 |
| 7 | Deep Discover Dome | EX2306_D07_04B | Unidentified | 95% EtOH | Rare Fauna | 20230830 | 195808 | 55.013084 | -140.832968 | 3,250.76 | 34.657 | 1.549 | 3.501 |
| 7 | Deep Discover Dome | EX2306_D07_05B | Crinoidea | 95% EtOH | Rare Fauna | 20230830 | 201803 | 55.012889 | -140.833308 | 3,240.14 | 34.657 | 1.549 | 3.556 |
| 7 | Deep Discover Dome | EX2306_D07_07B | Crinoidea | 95% EtOH | Rare Fauna | 20230830 | 205533 | 55.012667 | -140.833516 | 3,215.45 | 34.658 | 1.540 | 3.590 |
| 7 | Deep Discover Dome | EX2306_D07_08B | Anemone | 95% EtOH | Rare Fauna | 20230830 | 210913 | 55.012657 | -140.833877 | 3,208.08 | 34.657 | 1.539 | 3.513 |
| 7 | Deep Discover Dome | EX2306_D07_09B | Fungiacyathus | 95% EtOH | Rare Fauna | 20230830 | 215759 | 55.01209 | -140.834254 | 3,184.49 | 34.647 | 1.566 | 3.525 |
| 7 | Deep Discover Dome | EX2306_D07_11B | Ophiuroidea | 95% EtOH | Rare Fauna | 20230830 | 223045 | 55.011774 | -140.8351 | 3,178.38 | 34.658 | 1.544 | 3.529 |
| 7 | Deep Discover Dome | EX2306_D07_02G_A01B | Antipatharia | Dried | n/a | 20230830 | 191204 | 55.013238 | -140.832591 | 3,275.73 | 34.657 | 1.547 | 3.572 |
| 7 | Deep Discover Dome | EX2306_D07_02G_A02B | Atlantisella | 95% EtOH | n/a | 20230830 | 191204 | 55.013238 | -140.832591 | 3,275.73 | 34.657 | 1.547 | 3.572 |
| 7 | Deep Discover Dome | EX2306_D07_05B_A01B | amphipoda | 95% EtOH | n/a | 20230830 | 201803 | 55.012889 | -140.833308 | 3,240.14 | 34.657 | 1.549 | 3.556 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | Deep Discover Dome | EX2306_D07_10G_A01B | Porifera | 95% EtOH | n/a | 20230830 | 222733 | 55.011749 | -140.834985 | 3,177.95 | 34.660 | 1.547 | 3.522 |
| 7 | Deep Discover Dome | EX2306_D07_10G_A02B | Hexactinellida | 95% EtOH | n/a | 20230830 | 222733 | 55.011749 | -140.834985 | 3,177.95 | 34.660 | 1.547 | 3.522 |
| 7 | Deep Discover Dome | EX2306_D07_11B_A01B | Ophiuroidea | 95% EtOH | n/a | 20230830 | 223045 | 55.011774 | -140.8351 | 3,178.38 | 34.658 | 1.544 | 3.529 |
| 7 | Deep Discover Dome | EX2306_D07_11B_A03B | Hydrozoa | 95% EtOH | n/a | 20230830 | 223045 | 55.011774 | -140.8351 | 3,178.38 | 34.658 | 1.544 | 3.529 |
| 7 | Deep Discover Dome | EX2306_D07_11B_A04B | Porifera | 95% EtOH | n/a | 20230830 | 223045 | 55.011774 | -140.8351 | 3,178.38 | 34.658 | 1.544 | 3.529 |
| 8 | Denson Seamount | EX2306_D08_02B | Poecillastra | 95% EtOH | Rare Fauna | 20230831 | 174345 | 54.138318 | -137.379518 | 1,456.29 | 34.462 | 2.564 | 0.645 |
| 8 | Denson Seamount | EX2306_D08_03B | Hexactinellida | 95% EtOH | Rare Fauna | 20230831 | 180930 | 54.138082 | -137.379751 | 1,442.54 | 34.456 | 2.553 | 0.683 |
| 8 | Denson Seamount | EX2306_D08_05B | Pedicellasteridae | 95% EtOH | Rare Fauna | 20230831 | 185734 | 54.13789 | -137.380079 | 1,417.48 | 34.460 | 2.544 | 0.657 |
| 8 | Denson Seamount | EX2306_D08_06B | Berthella | 95% EtOH | Rare Fauna | 20230831 | 203409 | 54.136744 | -137.381451 | 1,344.80 | 34.444 | 2.616 | 0.597 |
| 8 | Denson Seamount | EX2306_D08_07B | Ophiuroidea | 95% EtOH | Rare Fauna | 20230831 | 214213 | 54.136152 | -137.382816 | 1,290.91 | 34.452 | 2.565 | 0.661 |
| 8 | Denson Seamount | EX2306_D08_09B | solaster | 95% EtOH | Rare Fauna | 20230831 | 225615 | 54.135467 | -137.38464 | 1,276.30 | 34.458 | 2.545 | 0.688 |
| 8 | Denson Seamount | EX2306_D08_10B | Hertwigia | 95% EtOH | Rare Fauna | 20230831 | 232500 | 54.135243 | -137.385312 | 1,274.25 | 34.458 | 2.534 | 0.644 |
| 8 | Denson Seamount | EX2306_D08_04G_A01B | | 95% EtOH | n/a | 20230831 | 184504 | 54.137923 | -137.380107 | 1,420.44 | 34.455 | 2.562 | 0.668 |
| 8 | Denson Seamount | EX2306_D08_08G_A01B | Mysidacea | 95% EtOH | n/a | 20230831 | 222355 | 54.135704 | -137.383816 | 1,283.71 | 34.456 | 2.537 | 0.651 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Denson Seamount | EX2306_D08_08G_A02B | Ophiuroidea | 95% EtOH | n/a | 20230831 | 222355 | 54.135704 | -137.383816 | 1,283.71 | 34.456 | 2.537 | 0.651 |
| 8 | Denson Seamount | EX2306_D08_08G_A03B | Polychaeta | 95% EtOH | n/a | 20230831 | 222355 | 54.135704 | -137.383816 | 1,283.71 | 34.456 | 2.537 | 0.651 |
| 8 | Denson Seamount | EX2306_D08_10B_A01B | Ophiuroidea | 95% EtOH | n/a | 20230831 | 232500 | 54.135243 | -137.385312 | 1,274.25 | 34.458 | 2.534 | 0.644 |
| 8 | Denson Seamount | EX2306_D08_10B_A02B | Hexactinellida | 95% EtOH | n/a | 20230831 | 232500 | 54.135243 | -137.385312 | 1,274.25 | 34.458 | 2.534 | 0.644 |
| 8 | Denson Seamount | EX2306_D08_11G_A01B | Onuphidae | 95% EtOH | n/a | 20230831 | 233336 | 54.1353 | -137.385175 | 1,273.55 | 34.455 | 2.563 | 0.668 |
| 8 | Denson Seamount | EX2306_D08_11G_A02B | Porifera | 95% EtOH | n/a | 20230831 | 233336 | 54.1353 | -137.385175 | 1,273.55 | 34.455 | 2.563 | 0.668 |
| 8 | Denson Seamount | EX2306_D08_11G_A03B | Porifera | 95% EtOH | n/a | 20230831 | 233336 | 54.1353 | -137.385175 | 1,273.55 | 34.455 | 2.563 | 0.668 |
| 9 | Ernest Sound | EX2306_D09_02B | brachiopoda | 95% EtOH | Rare Fauna | 20230902 | 214030 | 55.966071 | -132.081075 | 465.89 | 33.353 | 5.946 | 2.851 |
| 9 | Ernest Sound | EX2306_D09_02B_A01B | Polynoidae | 95% EtOH | n/a | 20230902 | 214030 | 55.966071 | -132.081075 | 465.89 | 33.353 | 5.946 | 2.851 |
| 9 | Ernest Sound | EX2306_D09_02B_A02B | Serpulidae | 95% EtOH | n/a | 20230902 | 214030 | 55.966071 | -132.081075 | 465.89 | 33.353 | 5.946 | 2.851 |
| 9 | Ernest Sound | EX2306_D09_02B_A04B | Amphipoda | 95% EtOH | n/a | 20230902 | 214030 | 55.966071 | -132.081075 | 465.89 | 33.353 | 5.946 | 2.851 |
| 9 | Ernest Sound | EX2306_D09_02B_A05B | Bryozoa | 95% EtOH | n/a | 20230902 | 214030 | 55.966071 | -132.081075 | 465.89 | 33.353 | 5.946 | 2.851 |
| 9 | Ernest Sound | EX2306_D09_02B_A06B | Porifera | 95% EtOH | n/a | 20230902 | 214030 | 55.966071 | -132.081075 | 465.89 | 33.353 | 5.946 | 2.851 |
| 10 | Behm Canal | EX2306_D10_03B | Cheiraster | 95% EtOH | Rare Fauna | 20230903 | 233819 | 55.225838 | -131.08641 | 386.48 | 33.284 | 6.086 | 3.216 |
| 10 | Behm Canal | EX2306_D10_04B | Primnoa | 95% EtOH | Connectivity Study | 20230903 | 234811 | 55.225876 | -131.086468 | 383.79 | 33.269 | 6.125 | 3.229 |
| 10 | Behm Canal | EX2306_D10_05B | Paragorgia | 95% EtOH | Connectivity Study | 20230904 | 000631 | 55.225821 | -131.086653 | 377.73 | 33.282 | 6.087 | 3.243 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Cordova Bay | EX2306_D11_03B | Desmophyllum dianthus | 95% EtOH | Connectivity Study | 20230904 | 185622 | 54.723342 | -132.537903 | 399.39 | 33.510 | 6.070 | 3.030 |
| 11 | Cordova Bay | EX2306_D11_04B | Cerianthidae | 95% EtOH | Characteristic of Site | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_06B | Porifera | 95% EtOH | Connectivity Study | 20230904 | 205222 | 54.722525 | -132.538048 | 336.19 | 33.496 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_10B | Primnoa pacifica | 95% EtOH | Connectivity Study | 20230904 | 221308 | 54.72192 | -132.539079 | 327.00 | 33.477 | 6.068 | 3.057 |
| 11 | Cordova Bay | EX2306_D11_11B | Akoya platinum | 95% EtOH | Connectivity Study | 20230904 | 232656 | 54.722659 | -132.540102 | 321.79 | 33.448 | 6.086 | 3.120 |
| 11 | Cordova Bay | EX2306_D11_14B | Unknown | 95% EtOH | Rare Fauna | 20230905 | 000831 | 54.723211 | -132.540644 | 321.02 | 33.435 | 6.111 | 3.139 |
| 11 | Cordova Bay | EX2306_D11_02G_A01B | Decapoda | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_02G_A02B | Brachiopoda | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_02G_A03B | Bryozoa | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_02G_A04B | Bryozoa | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_02G_A05B | Hydrozoa | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_02G_A06B | Caprellidea | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_02G_A07B | Polyplacophora | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_02G_A08B | sabelliae | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_02G_A09B | Myidae | 95% EtOH | n/a | 20230904 | 184518 | 54.72336 | -132.537856 | 406.65 | 33.507 | 6.071 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_04B_A01B | Nudibranchia | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Cordova Bay | EX2306_D11_04B_A02B | Stylaster | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A03B | Porifera | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A04B | Ophiuroidea | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A05B | calcera | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A06B | Hydrozoa | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A07B | Brachiopoda | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A08B | Polynoidae | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A09B |  | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A10B | Decapoda | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_04B_A11B | Gastropoda | 95% EtOH | n/a | 20230904 | 202023 | 54.722602 | -132.537938 | 335.32 | 33.498 | 6.063 | 3.048 |
| 11 | Cordova Bay | EX2306_D11_06B_A01B | Polynoidae | 95% EtOH | n/a | 20230904 | 205222 | 54.722525 | -132.538048 | 336.19 | 33.496 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A01B | auletta | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A02B | Ophiuroidea | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A03B | hydrozoa | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A04B | Ascidia | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A05B | Polyplacophora | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Cordova Bay | EX2306_D11_07G_A06B | Arcidae | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A07B | Serpulidae | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A08B | Caprellidea | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A09B | Scalpellidae | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A10B | Anemone | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A11B | Pectinidae | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A12B | Bryozoa | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_07G_A13B |  | 95% EtOH | n/a | 20230904 | 210208 | 54.722426 | -132.538079 | 333.21 | 33.498 | 6.065 | 3.059 |
| 11 | Cordova Bay | EX2306_D11_10B_A01B | Pandalidae | 95% EtOH | n/a | 20230904 | 221308 | 54.72192 | -132.539079 | 327.00 | 33.477 | 6.068 | 3.057 |
| 11 | Cordova Bay | EX2306_D11_11B_A01B | Amphipoda | 95% EtOH | n/a | 20230904 | 232656 | 54.722659 | -132.540102 | 321.79 | 33.448 | 6.086 | 3.120 |
| 11 | Cordova Bay | EX2306_D11_12G_A01B | Primnoa | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_12G_A02B | Eunicidae | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_12G_A03B | Caryophyllia | Dried | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_12G_A04B | Serpulidae | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_12G_A05B | Polyplacophora | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_12G_A06B | Gastropoda | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Cordova Bay | EX2306_D11_12G_A07B | Primnoa | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_12G_A08B | Brachiopoda | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_12G_A10B | Ascidia | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_12G_A11B | | 95% EtOH | n/a | 20230904 | 233423 | 54.722645 | -132.540189 | 320.99 | 33.448 | 6.084 | 3.133 |
| 11 | Cordova Bay | EX2306_D11_14B_A02B | Gastropoda | 95% EtOH | n/a | 20230905 | 000831 | 54.723211 | -132.540644 | 321.02 | 33.435 | 6.111 | 3.139 |
| 11 | Cordova Bay | EX2306_D11_14B_A03B | Ophiuroidea | 95% EtOH | n/a | 20230905 | 000831 | 54.723211 | -132.540644 | 321.02 | 33.435 | 6.111 | 3.139 |
| 11 | Cordova Bay | EX2306_D11_14B_A04B | | 95% EtOH | n/a | 20230905 | 000831 | 54.723211 | -132.540644 | 321.02 | 33.435 | 6.111 | 3.139 |
| 12 | Noyes Canyon | EX2306_D12_02B | Acanthogorgia | 95% EtOH | Connectivity Study | 20230905 | 182854 | 55.032773 | -134.519749 | 1,627.39 | 34.519 | 2.229 | 1.167 |
| 12 | Noyes Canyon | EX2306_D12_04B | Caryophyllia | 95% EtOH | Rare Fauna | 20230905 | 195148 | 55.031921 | -134.518599 | 1,573.40 | 34.515 | 2.247 | 1.138 |
| 12 | Noyes Canyon | EX2306_D12_05B | antipatharia | 95% EtOH | Rare Fauna | 20230905 | 201458 | 55.031868 | -134.518393 | 1,566.37 | 34.515 | 2.246 | 1.191 |
| 12 | Noyes Canyon | EX2306_D12_07B | Antipatharia | 95% EtOH | Rare Fauna | 20230905 | 221007 | 55.031368 | -134.517461 | 1,512.31 | 34.488 | 2.403 | 1.002 |
| 12 | Noyes Canyon | EX2306_D12_08B | Peribolaster | 95% EtOH | Rare Fauna | 20230905 | 222847 | 55.031319 | -134.517312 | 1,505.46 | 34.487 | 2.439 | 0.953 |
| 12 | Noyes Canyon | EX2306_D12_02B_A01B | Amphipoda | 95% EtOH | n/a | 20230905 | 182854 | 55.032773 | -134.519749 | 1,627.39 | 34.519 | 2.229 | 1.167 |
| 12 | Noyes Canyon | EX2306_D12_02B_A02B | Hydrozoa | 95% EtOH | n/a | 20230905 | 182854 | 55.032773 | -134.519749 | 1,627.39 | 34.519 | 2.229 | 1.167 |
| 12 | Noyes Canyon | EX2306_D12_04B_A01B | Cerianthidae | 95% EtOH | n/a | 20230905 | 195148 | 55.031921 | -134.518599 | 1,573.40 | 34.515 | 2.247 | 1.138 |
| 12 | Noyes Canyon | EX2306_D12_04B_A02B | Crustacea | 95% EtOH | n/a | 20230905 | 195148 | 55.031921 | -134.518599 | 1,573.40 | 34.515 | 2.247 | 1.138 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | Noyes Canyon | EX2306_D12_05B_A01B | Asbestopluma | 95% EtOH | n/a | 20230905 | 201458 | 55.031868 | -134.518393 | 1,566.37 | 34.515 | 2.246 | 1.191 |
| 12 | Noyes Canyon | EX2306_D12_05B_A02B | Ophiuroidea | 95% EtOH | n/a | 20230905 | 201458 | 55.031868 | -134.518393 | 1,566.37 | 34.515 | 2.246 | 1.191 |
| 12 | Noyes Canyon | EX2306_D12_05B_A03B | Polynoidae | 95% EtOH | n/a | 20230905 | 201458 | 55.031868 | -134.518393 | 1,566.37 | 34.515 | 2.246 | 1.191 |
| 12 | Noyes Canyon | EX2306_D12_05B_A04B | Amphipoda | 95% EtOH | n/a | 20230905 | 201458 | 55.031868 | -134.518393 | 1,566.37 | 34.515 | 2.246 | 1.191 |
| 14 | Chatham Seep | EX2306_D14_09B | Pedicellasteridae | 95% EtOH | Characteristic of Site | 20230907 | 231958 | 55.910633 | -135.498408 | 708.44 | 34.157 | 4.140 | 0.636 |
| 14 | Chatham Seep | EX2306_D14_10B | Fusitriton oregonensis | 95% EtOH | Characteristic of Site | 20230907 | 232622 | 55.91067 | -135.498699 | 709.16 | 34.157 | 4.143 | 0.651 |
| 14 | Chatham Seep | EX2306_D14_01B | Porifera | 95% EtOH | Characteristic of Site | 20230907 | 201004 | 55.91011 | -135.49912 | 705.26 | 34.157 | 4.113 | 0.630 |
| 14 | Chatham Seep | EX2306_D14_05B | Porifera | 95% EtOH | Characteristic of Site | 20230907 | 211131 | 55.910059 | -135.499324 | 700.32 | 34.153 | 4.132 | 0.623 |
| 14 | Chatham Seep | EX2306_D14_06B | Provanna | 95% EtOH | Rare Fauna | 20230907 | 221059 | 55.910284 | -135.498958 | 706.20 | 34.155 | 4.124 | 0.636 |
| 14 | Chatham Seep | EX2306_D14_07B | Cladorhizidae | 95% EtOH | Characteristic of Site | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_01B_A01B | Porifera | 95% EtOH | n/a | 20230907 | 201004 | 55.91011 | -135.49912 | 705.26 | 34.157 | 4.113 | 0.630 |
| 14 | Chatham Seep | EX2306_D14_01B_A02B | Porifera | 95% EtOH | n/a | 20230907 | 201004 | 55.91011 | -135.49912 | 705.26 | 34.157 | 4.113 | 0.630 |
| 14 | Chatham Seep | EX2306_D14_01B_A04B | Porifera | 95% EtOH | n/a | 20230907 | 201004 | 55.91011 | -135.49912 | 705.26 | 34.157 | 4.113 | 0.630 |
| 14 | Chatham Seep | EX2306_D14_01B_A05B | Porifera | 95% EtOH | n/a | 20230907 | 201004 | 55.91011 | -135.49912 | 705.26 | 34.157 | 4.113 | 0.630 |
| 14 | Chatham Seep | EX2306_D14_03G_A01B | nemertea | 95% EtOH | n/a | 20230907 | 202234 | 55.910076 | -135.4992 | 705.18 | 34.162 | 4.106 | 0.658 |
| 14 | Chatham Seep | EX2306_D14_03G_A02B | Hirudinea | 95% EtOH | n/a | 20230907 | 202234 | 55.910076 | -135.4992 | 705.18 | 34.162 | 4.106 | 0.658 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Chatham Seep | EX2306_D14_03G_A03B | Polychaeta | 95% EtOH | n/a | 20230907 | 202234 | 55.910076 | -135.4992 | 705.18 | 34.162 | 4.106 | 0.658 |
| 14 | Chatham Seep | EX2306_D14_03G_A04B | Porifera | 95% EtOH | n/a | 20230907 | 202234 | 55.910076 | -135.4992 | 705.18 | 34.162 | 4.106 | 0.658 |
| 14 | Chatham Seep | EX2306_D14_03G_A05B | turbellaria | 95% EtOH | n/a | 20230907 | 202234 | 55.910076 | -135.4992 | 705.18 | 34.162 | 4.106 | 0.658 |
| 14 | Chatham Seep | EX2306_D14_03G_A06B | Anthozoa | 95% EtOH | n/a | 20230907 | 202234 | 55.910076 | -135.4992 | 705.18 | 34.162 | 4.106 | 0.658 |
| 14 | Chatham Seep | EX2306_D14_05B_A01B | corallidae | 95% EtOH | n/a | 20230907 | 211131 | 55.910059 | -135.499324 | 700.32 | 34.153 | 4.132 | 0.623 |
| 14 | Chatham Seep | EX2306_D14_05B_A02B | Crustacea | 95% EtOH | n/a | 20230907 | 211131 | 55.910059 | -135.499324 | 700.32 | 34.153 | 4.132 | 0.623 |
| 14 | Chatham Seep | EX2306_D14_06B_A01B | Amphipoda | 95% EtOH | n/a | 20230907 | 221059 | 55.910284 | -135.498958 | 706.20 | 34.155 | 4.124 | 0.636 |
| 14 | Chatham Seep | EX2306_D14_07B_A02B | Porifera | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_07B_A03B | Polychaeta | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_07B_A04B | Hydrozoa | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_07B_A05B | Ceriantharia | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_07B_A06B | priapulida | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_07B_A07B | Gastropoda | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_07B_A08B | tubularia | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_07B_A09B | Hydrozoa | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |
| 14 | Chatham Seep | EX2306_D14_07B_A10B | Unknown | 95% EtOH | n/a | 20230907 | 223441 | 55.910444 | -135.498809 | 705.23 | 34.157 | 4.125 | 0.615 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Chatham Seep | EX2306_D14_09B_A01B | Vesicomyidae | 95% EtOH | n/a | 20230907 | 231958 | 55.910633 | -135.498408 | 708.44 | 34.157 | 4.140 | 0.636 |
| 14 | Chatham Seep | EX2306_D14_09B_A02B | Amphipoda | 95% EtOH | n/a | 20230907 | 231958 | 55.910633 | -135.498408 | 708.44 | 34.157 | 4.140 | 0.636 |
| 14 | Chatham Seep | EX2306_D14_09B_A03B | Hydrozoa | 95% EtOH | n/a | 20230907 | 231958 | 55.910633 | -135.498408 | 708.44 | 34.157 | 4.140 | 0.636 |
| 14 | Chatham Seep | EX2306_D14_11G_A01B | Hydrozoa | 95% EtOH | n/a | 20230907 | 235849 | 55.910978 | -135.496959 | 707.11 | 34.156 | 4.122 | 0.633 |
| 15 | Middleton Canyon | EX2306_D15_02B | Cladopathidae | 10% Formalin | Rare Fauna | 20230910 | 190535 | 59.248404 | -145.715549 | 2,195.64 | 34.607 | 1.805 | 2.198 |
| 15 | Middleton Canyon | EX2306_D15_03B | Hydrozoa | 95% EtOH | Rare Fauna | 20230910 | 194515 | 59.248469 | -145.715276 | 2,180.77 | 34.602 | 1.787 | 0.897 |
| 15 | Middleton Canyon | EX2306_D15_06B | Decapoda | 95% EtOH | Connectivity Study | 20230910 | 222038 | 59.249435 | -145.712833 | 2,056.23 | 34.597 | 1.840 | 2.069 |
| 15 | Middleton Canyon | EX2306_D15_07B | Hydrozoa | 95% EtOH | Rare Fauna | 20230910 | 223137 | 59.249493 | -145.712559 | 2,044.74 | 34.591 | 1.844 | 1.991 |
| 15 | Middleton Canyon | EX2306_D15_09B | Farrea | 95% EtOH | Rare Fauna | 20230910 | 231814 | 59.249673 | -145.711964 | 2,011.39 | 34.589 | 1.854 | 1.966 |
| 15 | Middleton Canyon | EX2306_D15_03B_A01B | Nemertea | 95% EtOH | n/a | 20230910 | 194515 | 59.248469 | -145.715276 | 2,180.77 | 34.602 | 1.787 | 0.897 |
| 15 | Middleton Canyon | EX2306_D15_06B_A01B | Amphipoda | 95% EtOH | n/a | 20230910 | 222038 | 59.249435 | -145.712833 | 2,056.23 | 34.597 | 1.840 | 2.069 |
| 15 | Middleton Canyon | EX2306_D15_06B_A02B | Ophiuroidea | 95% EtOH | n/a | 20230910 | 222038 | 59.249435 | -145.712833 | 2,056.23 | 34.597 | 1.840 | 2.069 |
| 17 | Storey Island | EX2306_D17_02B | Zoantharia | 95% EtOH | Dominant Fauna | 20230911 | 235912 | 60.758777 | -147.373806 | 360.11 | 33.045 | 5.780 | 4.894 |
| 17 | Storey Island | EX2306_D17_02B_A01B | Amphipoda | 95% EtOH | n/a | 20230911 | 235912 | 60.758777 | -147.373806 | 360.11 | 33.045 | 5.780 | 4.894 |
| 17 | Storey Island | EX2306_D17_02B_A02B | Brachiopoda | 95% EtOH | n/a | 20230911 | 235912 | 60.758777 | -147.373806 | 360.11 | 33.045 | 5.780 | 4.894 |
| 17 | Storey Island | EX2306_D17_02B_A03B | Decapoda | 95% EtOH | n/a | 20230911 | 235912 | 60.758777 | -147.373806 | 360.11 | 33.045 | 5.780 | 4.894 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Storey Island | EX2306_D17_02B_A04B | Chaetognatha | 95% EtOH | n/a | 20230911 | 235912 | 60.758777 | -147.373806 | 360.11 | 33.045 | 5.780 | 4.894 |
| 17 | Storey Island | EX2306_D17_02B_A05B | Polychaeta | 95% EtOH | n/a | 20230911 | 235912 | 60.758777 | -147.373806 | 360.11 | 33.045 | 5.780 | 4.894 |
| 18 | Gumby Ridge | EX2306_D18_02B | Balticina | 95% EtOH | Characteristic of Site | 20230912 | 191331 | 59.07455 | -147.012799 | 1,865.07 | 34.556 | 2.015 | 1.517 |
| 18 | Gumby Ridge | EX2306_D18_03B | Coraliidae | 95% EtOH | Rare Fauna | 20230912 | 205206 | 59.073802 | -147.012 | 1,805.71 | 34.539 | 2.117 | 1.269 |
| 18 | Gumby Ridge | EX2306_D18_05B | Lophaster | 95% EtOH | Connectivity Study | 20230912 | 210040 | 59.073847 | -147.012022 | 1,804.30 | 34.535 | 2.142 | 1.322 |
| 18 | Gumby Ridge | EX2306_D18_06B | Cladorhizidae | 95% EtOH | Characteristic of Site | 20230912 | 210636 | 59.073746 | -147.011885 | 1,806.61 | 34.536 | 2.133 | 1.253 |
| 18 | Gumby Ridge | EX2306_D18_07B | Serpulidae | 95% EtOH | Characteristic of Site | 20230912 | 214943 | 59.073343 | -147.011697 | 1,768.26 | 34.534 | 2.150 | 1.285 |
| 18 | Gumby Ridge | EX2306_D18_08B | Acanthogorgiidae | 95% EtOH | Rare Fauna | 20230912 | 215249 | 59.073352 | -147.011782 | 1,768.60 | 34.537 | 2.144 | 1.245 |
| 18 | Gumby Ridge | EX2306_D18_03B_A01B | Polynoidae | 95% EtOH | n/a | 20230912 | 205206 | 59.073802 | -147.012 | 1,805.71 | 34.539 | 2.117 | 1.269 |
| 18 | Gumby Ridge | EX2306_D18_08B_A01B | Anemone | 95% EtOH | n/a | 20230912 | 215249 | 59.073352 | -147.011782 | 1,768.60 | 34.537 | 2.144 | 1.245 |
| 18 | Gumby Ridge | EX2306_D18_09G_A01B | Bryozoa | 95% EtOH | n/a | 20230912 | 215520 | 59.073305 | -147.01174 | 1,768.28 | 34.536 | 2.143 | 1.295 |
| 19 | Lone Island | EX2306_D19_03B | Ptychogastria | 5% Formalin | Rare Fauna | 20230913 | 202912 | 60.702171 | -147.699118 | 608.91 | 33.130 | 5.761 | 4.691 |
| 19 | Lone Island | EX2306_D19_04B | Demospongiae | 95% EtOH | Dominant Fauna | 20230913 | 205008 | 60.702174 | -147.699398 | 593.70 | 33.126 | 5.758 | 4.710 |
| 19 | Lone Island | EX2306_D19_06B | Caryophyllia | 95% EtOH | Rare Fauna | 20230913 | 214246 | 60.702334 | -147.699877 | 561.02 | 33.116 | 5.763 | 4.742 |
| 19 | Lone Island | EX2306_D19_03B_A01B | Polynoidae | 95% EtOH | n/a | 20230913 | 202912 | 60.702171 | -147.699118 | 608.91 | 33.130 | 5.761 | 4.691 |
| 19 | Lone Island | EX2306_D19_04B_A01B | gastropoda | 95% EtOH | n/a | 20230913 | 205008 | 60.702174 | -147.699398 | 593.70 | 33.126 | 5.758 | 4.710 |

| Dive # | Site Name | Sample #*DO | Field Sample ID | Preservative | Collection Rationale | Date | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (C) | DO (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | Lone Island | EX2306_D19_05G_A01B | Brachiopoda | 95% EtOH | n/a | 20230913 | 211201 | 60.702365 | -147.699778 | 579.87 | 33.125 | 5.760 | 4.696 |
| 19 | Lone Island | EX2306_D19_05G_A02B | Polychaeta | 95% EtOH | n/a | 20230913 | 211201 | 60.702365 | -147.699778 | 579.87 | 33.125 | 5.760 | 4.696 |
| 19 | Lone Island | EX2306_D19_05G_A03B | Corallimorpharia | 95% EtOH | n/a | 20230913 | 211201 | 60.702365 | -147.699778 | 579.87 | 33.125 | 5.760 | 4.696 |
| 19 | Lone Island | EX2306_D19_05G_A04B | Hydrozoa | 95% EtOH | n/a | 20230913 | 211201 | 60.702365 | -147.699778 | 579.87 | 33.125 | 5.760 | 4.696 |
| 19 | Lone Island | EX2306_D19_05G_A06B | Caprellidea | 95% EtOH | n/a | 20230913 | 211201 | 60.702365 | -147.699778 | 579.87 | 33.125 | 5.760 | 4.696 |
| 19 | Lone Island | EX2306_D19_06B_A01B | Brachiopoda | 95% EtOH | n/a | 20230913 | 214246 | 60.702334 | -147.699877 | 561.02 | 33.116 | 5.763 | 4.742 |
| 19 | Lone Island | EX2306_D19_06B_A02B | Decapoda | 95% EtOH | n/a | 20230913 | 214246 | 60.702334 | -147.699877 | 561.02 | 33.116 | 5.763 | 4.742 |
| 19 | Lone Island | EX2306_D19_06B_A03B | Hiatellidae | 95% EtOH | n/a | 20230913 | 214246 | 60.702334 | -147.699877 | 561.02 | 33.116 | 5.763 | 4.742 |
| 19 | Lone Island | EX2306_D19_06B_A04B | Serpulidae | 95% EtOH | n/a | 20230913 | 214246 | 60.702334 | -147.699877 | 561.02 | 33.116 | 5.763 | 4.742 |
| 19 | Lone Island | EX2306_D19_06B_A05B | chaetognatha | 95% EtOH | n/a | 20230913 | 214246 | 60.702334 | -147.699877 | 561.02 | 33.116 | 5.763 | 4.742 |
| 19 | Lone Island | EX2306_D19_06B_A06B | Isopoda | 95% EtOH | n/a | 20230913 | 214246 | 60.702334 | -147.699877 | 561.02 | 33.116 | 5.763 | 4.742 |
| 19 | Lone Island | EX2306_D19_08G_A01B | Epizoanthus | 95% EtOH | n/a | 20230914 | 000307 | 60.702584 | -147.703509 | 478.15 | 33.039 | 5.905 | 4.764 |
| 19 | Lone Island | EX2306_D19_08G_A02B | Pectinidae | 95% EtOH | n/a | 20230914 | 000307 | 60.702584 | -147.703509 | 478.15 | 33.039 | 5.905 | 4.764 |
| 19 | Lone Island | EX2306_D19_08G_A03B | Trichobranchidae | 95% EtOH | n/a | 20230914 | 000307 | 60.702584 | -147.703509 | 478.151001 | 33.0390014 6 | 5.90500021 | 4.7639999 39 |

* Biological sample numbers with "_A##" indicate associate samples.

**Table D3.** Inventory of water samples collected for eDNA analysis during EX2306.

| Dive # | Site Name | Sample # | Preservative | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (°C) | Dissolved Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Kodiak Shelf | EX2306_D01_07W | DNA/RNA Shield | eDNA | 20230824 | 231750 | 55.928406 | -152.918316 | 2,253.07 | 34.61 | 1.78 | 2.32 |
| 1 | Kodiak Shelf | EX2306_D01_08W | DNA/RNA Shield | eDNA | 20230824 | 234200 | 55.928021 | -152.919885 | 1,512.66 | 34.50 | 2.29 | 0.99 |
| 1 | Kodiak Shelf | EX2306_D01_09W | DNA/RNA Shield | eDNA | 20230825 | 000603 | 55.927545 | -152.920669 | 759.44 | 34.27 | 3.43 | 0.44 |
| 1 | Kodiak Shelf | EX2306_D01_10W | DNA/RNA Shield | eDNA | 20230825 | 001919 | 55.925513 | -152.921557 | 352.99 | 34.00 | 4.30 | 1.01 |
| 1 | Kodiak Shelf | EX2306_D01_06W | DNA/RNA Shield | eDNA | 20230824 | 824T00 | 55.927765 | -152.920456 |  | 34.65 | 1.56 | 3.41 |
| 2 | Kodiak Seep | EX2306_D02_08W | DNA/RNA Shield | eDNA | 20230825 | 234840 | 56.924476 | -149.557821 | 1,398.11 | 34.49 | 2.34 | 0.86 |
| 2 | Kodiak Seep | EX2306_D02_09W | DNA/RNA Shield | eDNA | 20230826 | 002611 | 56.922274 | -149.562402 | 234.76 | 33.88 | 4.06 | 0.98 |
| 2 | Kodiak Seep | EX2306_D02_07W | DNA/RNA Shield | eDNA | 20230825 | 230405 | 56.924994 | -149.557436 | 2,753.96 | 34.64 | 1.61 | 3.03 |
| 2 | Kodiak Seep | EX2306_D02_05W | DNA/RNA Shield | eDNA | 20230825 | 221003 | 56.92445 | -149.554051 | 4,231.07 | 34.68 | 1.47 | 4.48 |
| 2 | Kodiak Seep | EX2306_D02_06W | DNA/RNA Shield | eDNA | 20230825 | 221032 | 56.924445 | -149.555564 | 4,217.74 | 34.68 | 1.48 | 4.44 |
| 3 | Giacomini Seamount | EX2306_D03_12W | DNA/RNA Shield | eDNA | 20230826 | 233528 | 56.489106 | -146.319049 | 272.20 | 33.95 | 4.01 | 0.76 |
| 3 | Giacomini Seamount | EX2306_D03_04W | DNA/RNA Shield | eDNA | 20230826 | 185539 | 56.491915 | -146.312745 | 858.07 | 34.36 | 2.97 | 0.52 |
| 3 | Giacomini Seamount | EX2306_D03_06W | DNA/RNA Shield | eDNA | 20230826 | 193800 | 56.491597 | -146.313779 | 1,036.49 | 34.40 | 2.88 | 0.54 |
| 3 | Giacomini Seamount | EX2306_D03_01W | DNA/RNA Shield | eDNA | 20230826 | 171516 | 56.492299 | -146.311803 | 894.75 | 34.35 | 3.02 | 0.54 |
| 4 | Quinn Seamount | EX2306_D04_09W | DNA/RNA Shield | eDNA | 20230827 | 231647 | 56.354148 | -145.137043 | 1,853.22 | 34.55 | 2.07 | 1.38 |

| Dive # | Site Name | Sample # | Preservative | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (°C) | Dissolved Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Quinn Seamount | EX2306_D04_01W | DNA/RNA Shield | eDNA | 20230827 | 175729 | 56.356835 | -145.125266 | 376.39 | 34.00 | 4.16 | 1.10 |
| 4 | Quinn Seamount | EX2306_D04_07W | DNA/RNA Shield | eDNA | 20230827 | 223016 | 56.354582 | -145.135612 | 1,901.15 | 34.56 | 2.00 | 1.57 |
| 4 | Quinn Seamount | EX2306_D04_10W | DNA/RNA Shield | eDNA | 20230828 | 001755 | 56.352144 | -145.140051 | 402.12 | 34.02 | 4.17 | 0.95 |
| 5 | Surveyor Seamount | EX2306_D05_12W | DNA/RNA Shield | eDNA | 20230828 | 235310 | 56.086495 | -144.305569 | 381.67 | 34.08 | 3.90 | 0.77 |
| 5 | Surveyor Seamount | EX2306_D05_09W | DNA/RNA Shield | eDNA | 20230828 | 213054 | 56.088451 | -144.30211 | 490.93 | 34.15 | 3.74 | 0.63 |
| 5 | Surveyor Seamount | EX2306_D05_01W | DNA/RNA Shield | eDNA | 20230828 | 172118 | 56.09122 | -144.298363 | 642.81 | 34.16 | 3.75 | 0.64 |
| 6 | Durgin Guyot | EX2306_D06_07W | DNA/RNA Shield | eDNA | 20230829 | 231418 | 55.807043 | -141.750564 | 1,032.89 | 34.37 | 2.95 | 0.51 |
| 6 | Durgin Guyot | EX2306_D06_01W | DNA/RNA Shield | eDNA | 20230829 | 173407 | 55.80637 | -141.746169 | 1,269.68 | 34.44 | 2.61 | 0.63 |
| 6 | Durgin Guyot | EX2306_D06_08W | DNA/RNA Shield | eDNA | 20230830 | 001757 | 55.808351 | -141.752336 | 442.77 | 34.06 | 4.19 | 0.80 |
| 7 | Deep Discover Dome | EX2306_D07_12W | DNA/RNA Shield | eDNA | 20230830 | 224301 | 55.011575 | -140.835451 | 3,171.58 | 34.66 | 1.55 | 3.46 |
| 7 | Deep Discover Dome | EX2306_D07_06W | DNA/RNA Shield | eDNA | 20230830 | 203139 | 55.01287 | -140.83325 | 3,228.77 | 34.66 | 1.54 | 3.51 |
| 7 | Deep Discover Dome | EX2306_D07_01W | DNA/RNA Shield | eDNA | 20230830 | 182420 | 55.013656 | -140.832209 | 3,287.95 | 34.66 | 1.54 | 3.58 |
| 7 | Deep Discover Dome | EX2306_D07_13W | DNA/RNA Shield | eDNA | 20230831 | 001749 | 55.010895 | -140.839153 | 423.46 | 34.02 | 4.33 | 1.06 |
| 8 | Denson Seamount | EX2306_D08_12W | DNA/RNA Shield | eDNA | 20230831 | 234041 | 54.135053 | -137.385477 | 1,272.42 | 34.46 | 2.54 | 0.66 |
| 8 | Denson Seamount | EX2306_D08_01W | DNA/RNA Shield | eDNA | 20230831 | 172845 | 54.138298 | -137.379614 | 1,456.40 | 34.46 | 2.52 | 0.69 |
| 8 | Denson Seamount | EX2306_D08_13W | DNA/RNA Shield | eDNA | 20230901 | 001516 | 54.135205 | -137.384605 | 452.05 | 34.03 | 4.39 | 1.05 |

| Dive # | Site Name | Sample # | Preservative | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (°C) | Dissolved Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | Ernest Sound | EX2306_D09_05W | DNA/RNA Shield | eDNA | 20230903 | 002642 | 55.965815 | -132.079875 | 126.31 | 33.15 | 5.99 | 2.98 |
| 9 | Ernest Sound | EX2306_D09_04W | DNA/RNA Shield | eDNA | 20230903 | 001558 | 55.965689 | -132.079762 | 266.90 | 33.33 | 5.93 | 2.87 |
| 9 | Ernest Sound | EX2306_D09_03W | DNA/RNA Shield | eDNA | 20230902 | 225130 | 55.966088 | -132.081071 | 419.31 | 33.36 | 5.94 | 2.85 |
| 9 | Ernest Sound | EX2306_D09_01W | DNA/RNA Shield | eDNA | 20230902 | 182201 | 55.966406 | -132.082177 | 545.52 | 33.37 | 5.94 | 2.83 |
| 10 | Behm Canal | EX2306_D10_06W | DNA/RNA Shield | eDNA | 20230904 | 001542 | 55.225707 | -131.086671 | 373.86 | 33.28 | 6.09 | 3.22 |
| 10 | Behm Canal | EX2306_D10_02W | DNA/RNA Shield | eDNA | 20230903 | 225834 | 55.225744 | -131.086175 | 401.49 | 33.28 | 6.09 | 3.24 |
| 10 | Behm Canal | EX2306_D10_01W | DNA/RNA Shield | eDNA | 20230903 | 214433 | 55.22513 | -131.084948 | 576.28 | 33.29 | 6.10 | 3.19 |
| 11 | Cordova Bay | EX2306_D11_13W | DNA/RNA Shield | eDNA | 20230905 | 000032 | 54.723113 | -132.54065 | 314.67 | 33.43 | 6.12 | 3.15 |
| 11 | Cordova Bay | EX2306_D11_08W | DNA/RNA Shield | eDNA | 20230904 | 214222 | 54.721962 | -132.538503 | 321.70 | 33.48 | 6.07 | 3.09 |
| 11 | Cordova Bay | EX2306_D11_09W | DNA/RNA Shield | eDNA | 20230904 | 221210 | 54.721923 | -132.539077 | 327.14 | 33.48 | 6.07 | 3.08 |
| 11 | Cordova Bay | EX2306_D11_05W | DNA/RNA Shield | eDNA | 20230904 | 203702 | 54.722469 | -132.537904 | 331.91 | 33.50 | 6.06 | 3.05 |
| 11 | Cordova Bay | EX2306_D11_01W | DNA/RNA Shield | eDNA | 20230904 | 172342 | 54.724383 | -132.537115 | 483.24 | 33.52 | 6.08 | 3.02 |
| 12 | Noyes Canyon | EX2306_D12_09W | DNA/RNA Shield | eDNA | 20230905 | 233534 | 55.030731 | -134.51627 | 1,453.61 | 34.48 | 2.47 | 0.90 |
| 12 | Noyes Canyon | EX2306_D12_06W | DNA/RNA Shield | eDNA | 20230905 | 215804 | 55.0314 | -134.517585 | 1,513.74 | 34.49 | 2.40 | 0.93 |
| 12 | Noyes Canyon | EX2306_D12_01W | DNA/RNA Shield | eDNA | 20230905 | 175232 | 55.033089 | -134.520282 | 1,633.37 | 34.52 | 2.23 | 1.21 |
| 12 | Noyes Canyon | EX2306_D12_10W | DNA/RNA Shield | eDNA | 20230906 | 001806 | 55.030772 | -134.511476 | 357.85 | 33.91 | 5.02 | 2.02 |

| Dive # | Site Name | Sample # | Preservative | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (°C) | Dissolved Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Chatham Seep | EX2306_D14_13W | DNA/RNA Shield | eDNA | 20230908 | 001537 | 55.911388 | -135.497189 | 371.65 | 33.96 | 5.07 | 1.77 |
| 14 | Chatham Seep | EX2306_D14_04W | DNA/RNA Shield | eDNA | 20230907 | 204456 | 55.91006 | -135.499334 | 699.24 | 34.16 | 4.12 | 0.64 |
| 14 | Chatham Seep | EX2306_D14_12W | DNA/RNA Shield | eDNA | 20230908 | 000130 | 55.911138 | -135.496994 | 706.83 | 34.16 | 4.13 | 0.63 |
| 14 | Chatham Seep | EX2306_D14_08W | DNA/RNA Shield | eDNA | 20230907 | 225853 | 55.910578 | -135.49811 | 708.65 | 34.16 | 4.12 | 0.65 |
| 14 | Chatham Seep | EX2306_D14_02W | DNA/RNA Shield | eDNA | 20230907 | 201047 | 55.910104 | -135.499135 | 705.26 | 34.16 | 4.11 | 0.63 |
| 15 | Middleton Canyon | EX2306_D15_10W | DNA/RNA Shield | eDNA | 20230910 | 232039 | 59.249803 | -145.711906 | 2,008.07 | 34.59 | 1.86 | 2.00 |
| 15 | Middleton Canyon | EX2306_D15_08W | DNA/RNA Shield | eDNA | 20230910 | 223359 | 59.249572 | -145.712516 | 2,041.51 | 34.59 | 1.84 | 2.05 |
| 15 | Middleton Canyon | EX2306_D15_01W | DNA/RNA Shield | eDNA | 20230910 | 182616 | 59.248444 | -145.715873 | 2,217.37 | 34.60 | 1.81 | 2.24 |
| 15 | Middleton Canyon | EX2306_D15_11W | DNA/RNA Shield | eDNA | 20230911 | 002033 | 59.251069 | -145.711925 | 351.40 | 33.89 | 4.45 | 1.46 |
| 15 | Middleton Canyon | EX2306_D15_04W | DNA/RNA Shield | eDNA | 20230910 | 195315 | 59.248455 | -145.715054 | 2,180.74 | 34.60 | 1.79 | 2.25 |
| 17 | Storey Island | EX2306_D17_04W | DNA/RNA Shield | eDNA | 20230912 | 002715 | 60.758885 | -147.373366 | 165.74 | 32.69 | 5.77 | 5.77 |
| 17 | Storey Island | EX2306_D17_03W | DNA/RNA Shield | eDNA | 20230912 | 000102 | 60.75877 | -147.373782 | 358.86 | 33.04 | 5.77 | 4.92 |
| 17 | Storey Island | EX2306_D17_01W | DNA/RNA Shield | eDNA | 20230911 | 225049 | 60.760213 | -147.372574 | 395.46 | 33.07 | 5.76 | 4.83 |
| 18 | Gumby Ridge | EX2306_D18_11W | DNA/RNA Shield | eDNA | 20230912 | 231620 | 59.072764 | -147.011203 | 1,736.50 | 34.55 | 2.04 | 1.46 |
| 18 | Gumby Ridge | EX2306_D18_10W | DNA/RNA Shield | eDNA | 20230912 | 222908 | 59.073241 | -147.01138 | 1,757.65 | 34.52 | 2.16 | 1.30 |
| 18 | Gumby Ridge | EX2306_D18_04W | DNA/RNA Shield | eDNA | 20230912 | 205344 | 59.073768 | -147.011934 | 1,805.55 | 34.54 | 2.11 | 1.33 |

| Dive # | Site Name | Sample # | Preservative | Collection Rationale | Date (yyyymmdd) | UTC Time (hhmmss) | Latitude (dd) | Longitude (dd) | Depth (m) | Salinity (ppt) | Temp (°C) | Dissolved Oxygen (mg/l) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | Gumby Ridge | EX2306_D18_01W | DNA/RNA Shield | eDNA | 20230912 | 190413 | 59.074656 | -147.012727 | 1,865.18 | 34.56 | 2.03 | 1.58 |
| 18 | Gumby Ridge | EX2306_D18_12W | DNA/RNA Shield | eDNA | 20230913 | 001806 | 59.067448 | -147.010166 | 422.12 | 33.99 | 4.23 | 1.10 |
| 19 | Lone Island | EX2306_D19_09W | DNA/RNA Shield | eDNA | 20230914 | 002112 | 60.702756 | -147.702299 | 176.51 | 32.73 | 5.79 | 5.46 |
| 19 | Lone Island | EX2306_D19_07W | DNA/RNA Shield | eDNA | 20230913 | 225559 | 60.702568 | -147.700732 | 512.12 | 33.11 | 5.76 | 4.75 |
| 19 | Lone Island | EX2306_D19_02W | DNA/RNA Shield | eDNA | 20230913 | 200035 | 60.702103 | -147.698968 | 618.16 | 33.13 | 5.76 | 4.68 |
| 19 | Lone Island | EX2306_D19_01W | DNA/RNA Shield | eDNA | 20230913 | 192032 | 60.702074 | -147.69842 | 643.35 | 33.13 | 5.76 | 4.66 |