

# 2024 NOAA Ocean Exploration Expeditions on NOAA Ship *Okeanos Explorer*

*Papahānaumokuākea Marine National Monument, Pacific Islands Heritage Marine National Monument, and Hawaiian Waters*

## Background

[Beyond the Blue: Illuminating the Pacific](#) is envisioned as a multiyear, collaborative science and research campaign aimed at bringing together partners to raise collective knowledge, understanding, and appreciation of waters in the Pacific Islands region through coastal and ocean mapping, exploration, and characterization. This year, NOAA Ocean Exploration has started working with partners to conduct multiple expeditions on NOAA Ship *Okeanos Explorer*, lead outreach and education activities and events, and build additional partnerships in support of Beyond the Blue.

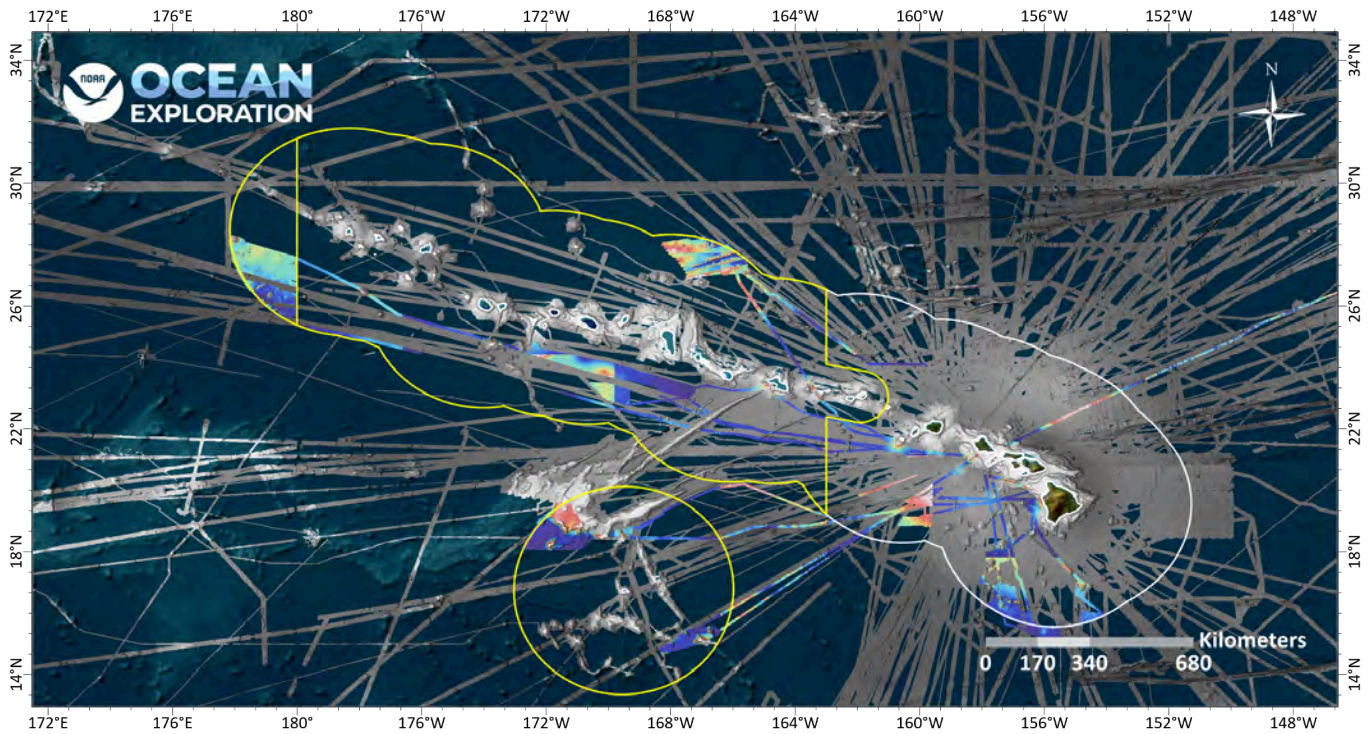
As part of the *Okeanos Explorer* 2024 field season, five expeditions were planned to collect critical mapping data in the deep waters of Hawai'i in order to establish a baseline in these areas to catalyze further exploration, research, and management activities in the region. In addition to improving fundamental understanding of the region, mapping data collected during these expeditions will inform future remotely operated vehicle (ROV) dive planning to support systematic exploration.

This report summarizes these six expeditions ([EX2402: Hawai'i Mapping](#), [EX2403: Papahānaumokuākea Mapping 1](#), [EX2404: Papahānaumokuākea Mapping 2](#), [EX2405: Johnston Atoll Mapping 1](#), [EX2406: Johnston Atoll Mapping 2](#), and [EX2501: Papahānaumokuākea Mapping 3](#)) and additional information can be found on the [NOAA Ocean Exploration website](#).

## 2024 Mapping Coverage Summary

In total, **these six expeditions mapped approximately 251,901 square kilometers of seafloor deeper than 200 m using multibeam sonar within the U.S. EEZ. This includes 136,685 square kilometers of the Papahānaumokuākea Marine National Monument, 43,840 square**

kilometers of Johnston Atoll, and 71,376 square kilometers of the Hawaiian EEZ outside of Marine National Monuments. The three expeditions to Papahānaumokuākea increased the Monument’s modern mapping coverage by approximately 9%. The two expeditions to Johnston Atoll mapped approximately 10% of the Johnston unit of the Pacific Islands Heritage Marine National Monument.



*Map of high-resolution bathymetric data added by NOAA Ship Okeanos Explorer in the 2024 field season. Previously existing data is displayed in grayscale with new coverage displayed in color. Yellow boundaries represent the Papahānaumokuākea Marine National Monument and the Johnston Atoll Unit of the Pacific Islands Heritage Marine National Monument.*

## EX2402: Hawai'i Mapping

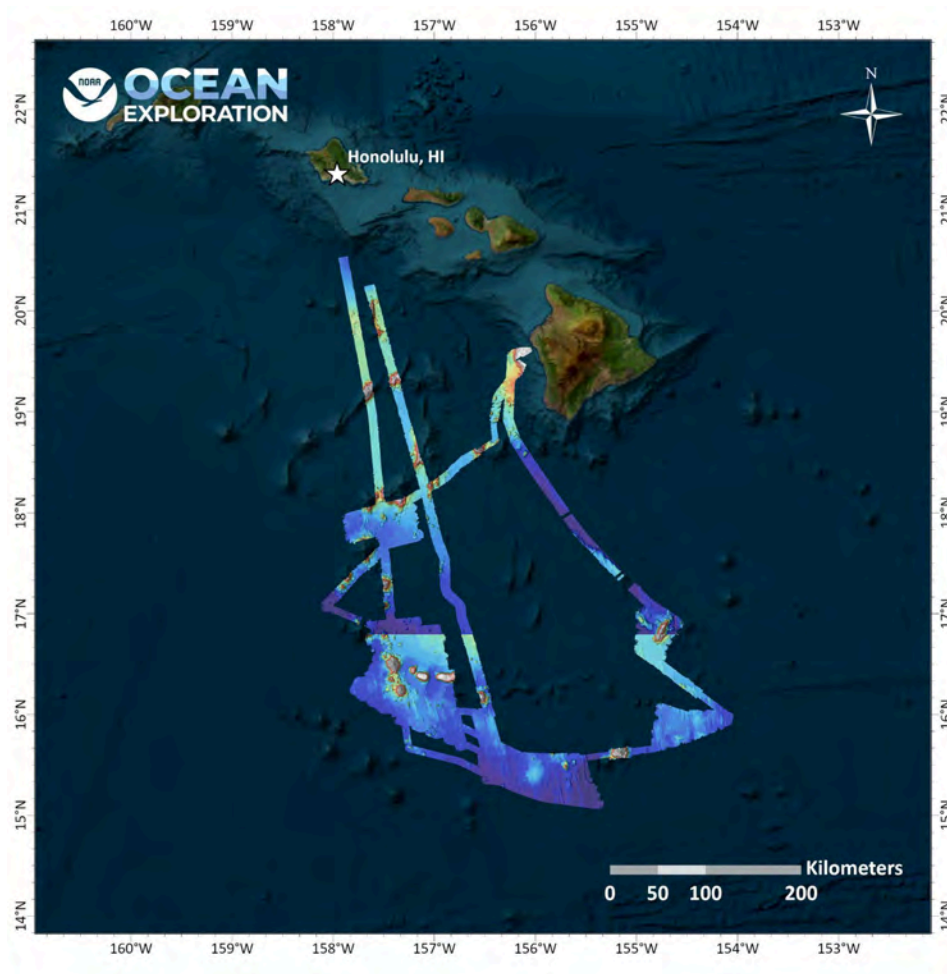
**Expedition Dates:** May 14 - June 9, 2024 | **Days at Sea:** 27

**Expedition Coordinator:** Sam Cuellar (samuel.cuellar@noaa.gov)

### Expedition Summary

- **Bathymetry mapping coverage: 43,113 square kilometers (14,465 square nautical miles)** in waters deeper than 200 meters (656 feet), including nearly **35,515 square kilometers (22,068 square nautical miles) within the U.S Exclusive Economic Zone (EEZ)**
- Focused **multibeam backscatter surveys** near the edge of the U.S. EEZ **targeted areas of interest for the U.S. Geological Survey** to improve the understanding of the shape and composition of the seafloor in this area.
- Several **unnamed and unmapped seafloor features**, including **two seamounts and one guyot mapped** in the southwest portion of the mapped area.
- **Conducted a live ship-to-shore interaction with a school group in Guam**, to communicate the goals of the expedition and the importance of ocean exploration.
- **Completed mapping of Newell Seamount**, which was previously only partially mapped

### Expedition Summary Map



# EX2403: Papahānaumokuākea Mapping 1

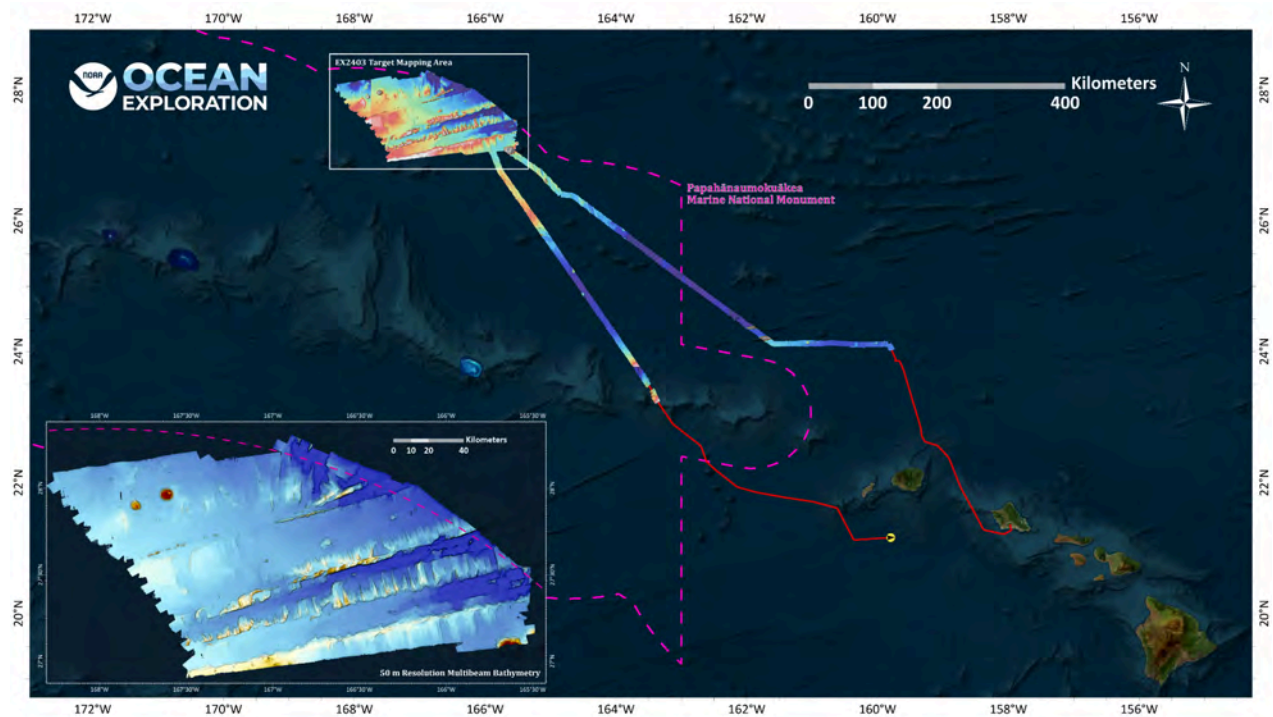
**Expedition Dates:** June 21 - July 9, 2024 | **Days at Sea:** 19

**Expedition Coordinator:** Thomas Morrow (thomas.morrow@noaa.gov)

## Expedition Summary

- **Bathymetry mapping coverage: 42,272 square kilometers (14,183 square nautical miles)** in waters deeper than 200 meters (656 feet), including nearly **41,086 square kilometers (25,529 square nautical miles) within the U.S Exclusive Economic Zone (EEZ).**
- Focused **multibeam bathymetry and backscatter surveys along the Murray Fracture Zone**, revealing new insight into the 100 million year old history of the now-extinct Pacific-Farallon Spreading Center.
- **Mapped a previously unnamed and unmapped 1,300 meter seamount** with interesting features mapped, including a 2.4 kilometer-wide caldera.
- **Hosted Native Hawaiian community liaisons, Malia Evans and Makoa Pascoe**, to highlight the Native Hawaiian knowledge and practices that were an important part of the history of the monument. This effort was developed in partnership with NOAA's Office of National Marine Sanctuaries.
- **Conducted live ship-to-shore interactions with the Hui Mālama i ke Ala 'Ūlili Keiki Papa** community summer mentorship program and the **Punahou School on O'ahu.**
- **Trained three Explorer-in-Training interns** in ocean mapping data acquisition and processing as well as **one science communication Explorer-in-Training.**

## Expedition Summary Map



## EX2404: Papahānaumokuākea Mapping 2

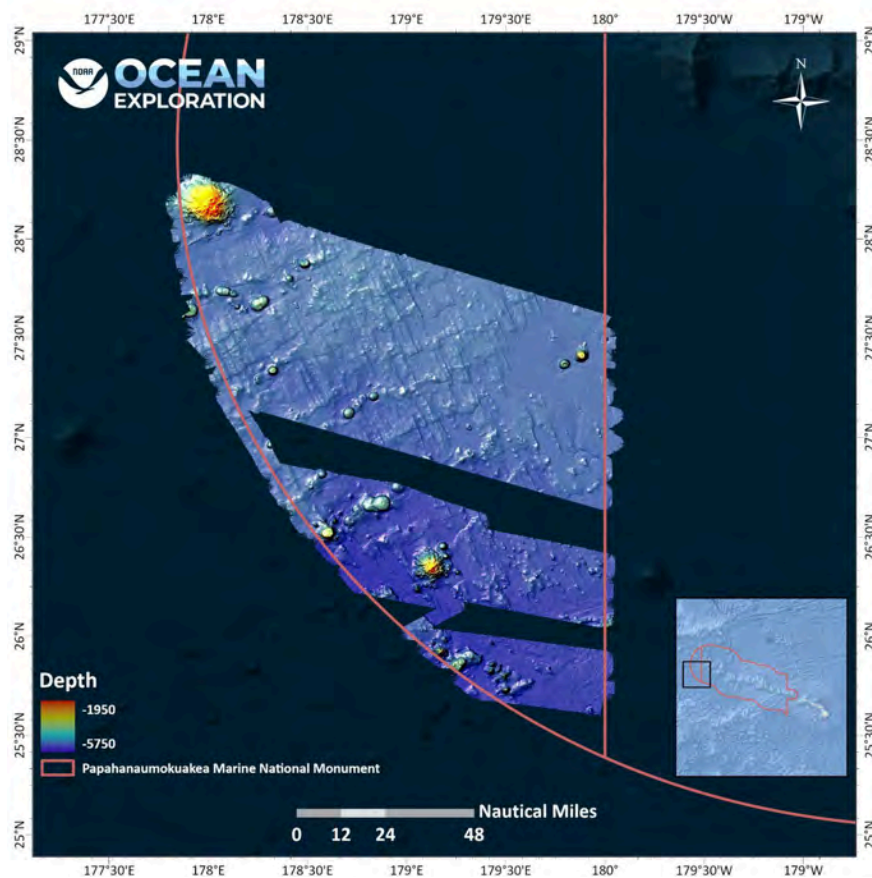
**Expedition Dates:** July 18 - August 12, 2024 | **Days at Sea:** 26

**Expedition Coordinator:** Sam Candio (samuel.candio@noaa.gov)

### Expedition Summary

- **Bathymetry mapping coverage: 77,183 square kilometers (47,959 square nautical miles)** in waters deeper than 200 meters (656 feet), including nearly **76,072 square kilometers (47,269 square nautical miles) within the U.S Exclusive Economic Zone (EEZ).**
- Focused **surveys west of antimeridian inside Papahānaumokuākea Expansion Zone.**
- **Hosted Native Hawaiian community liaison, Kalā Hind Boyd,** to highlight the Native Hawaiian knowledge and practices that are an important part of the history of the monument. This effort was developed in partnership with NOAA's Office of National Marine Sanctuaries.
- **Conducted live ship-to-shore interactions with school groups and community organizations,** including the Council for Native Hawaiian Advancement, to communicate the goals of the expedition and the importance of ocean exploration.
- **Trained three Explorer-in-Training interns** in ocean mapping data acquisition and processing.
- **Mapped previously unmapped seamounts,** including one rising more than 3,000 meters above the surrounding seafloor.

### Expedition Summary Map



## EX2405: Johnston Atoll Mapping Mapping 1

**Expedition Dates:** August 19 - September 7, 2024 | **Days at Sea:** 20

**Expedition Coordinator:** Shannon Hoy (shannon.hoy@noaa.gov)

### Expedition Summary

- **Bathymetry mapping coverage: 29,750 square kilometers (8,673 square nautical miles)** in waters deeper than 200 meters (656 feet), including **22,590 square kilometers (6,586 square nautical miles)** within the U.S Exclusive Economic Zone (EEZ).

## EX2406: Johnston Atoll Mapping Mapping 2

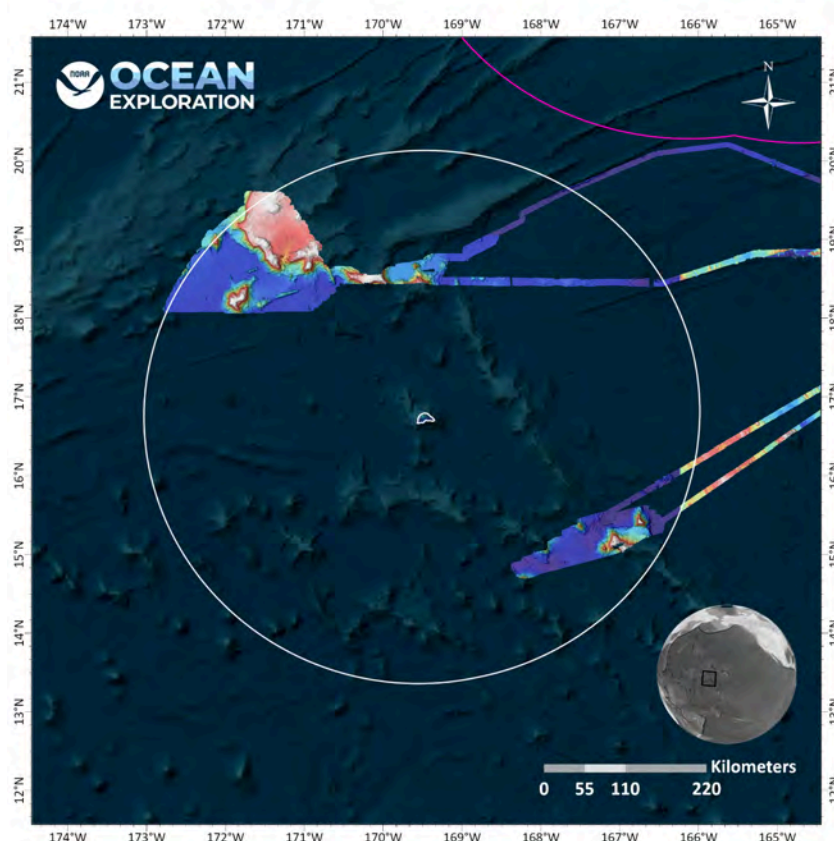
**Expedition Dates:** September 14 - October 10, 2024 | **Days at Sea:** 27

**Expedition Coordinator:** Thomas Morrow (thomas.morrow@noaa.gov)

### Expedition Summary

- **Bathymetry mapping coverage: 49,044 square kilometers (14,299 square nautical miles)** in waters deeper than 200 meters (656 feet), including **32,873 (9,584 square nautical miles)** within the U.S Exclusive Economic Zone (EEZ).
- **Trained three Explorer-in-Training interns** in ocean mapping data acquisition and processing.

### EX2405 & EX2406 Expedition Summary Map



# EX2501: Papahānaumokuākea Mapping 3

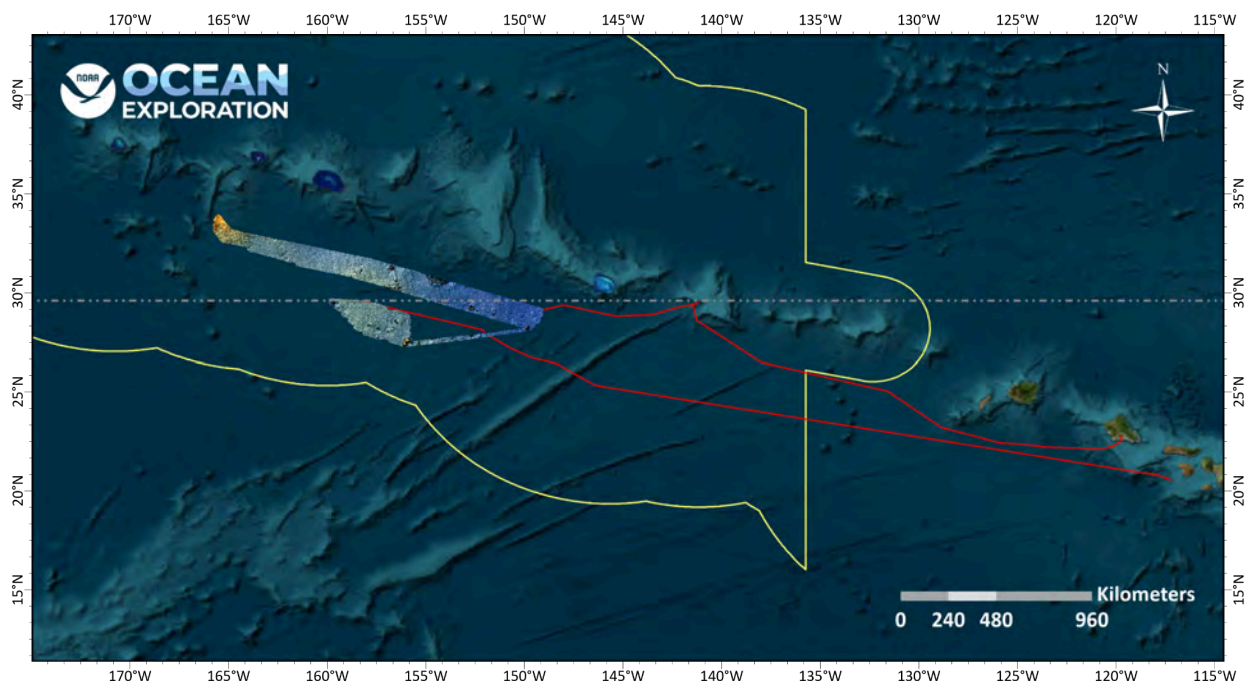
**Expedition Dates:** October 19 - November 12, 2024 | **Days at Sea:** 25

**Expedition Coordinator:** Trish Albano (trish.albano@noaa.gov)

## Expedition Summary:

- **Bathymetry mapping coverage: 43,029 square kilometers (12,545 square nautical miles)** in waters deeper than 200 meters (656 feet), all within the U.S Exclusive Economic Zone (EEZ).
- **Conducted 12 live ship-to-shore interactions** with school groups and community organizations.
- **Hosted Native Hawaiian community liaisons, Pīkake Kuniyoshi and Kalau‘ihilani Robins,** to highlight the Native Hawaiian knowledge and practices that were an important part of the history of the monument. This effort was developed in partnership with NOAA’s Office of National Marine Sanctuaries.
- Mapped **focused survey areas southeast of Nalukākala (Maro Reef)** in the Monument expansion zone.
- **Trained three Explorer-in-Training interns** in ocean mapping data acquisition and processing.

## Expedition Summary Map:



## Accessing Data from the 2024 field season:

- [Okeanos Explorer Live Operations Map](#)
- [NOAA Ocean Exploration Live Stream](#) (displays live data collection while underway)
- [NOAA Ocean Exploration Data Atlas](#) (data for completed expeditions have been submitted to archive and will be available approximately 180 days of the expedition's completion)