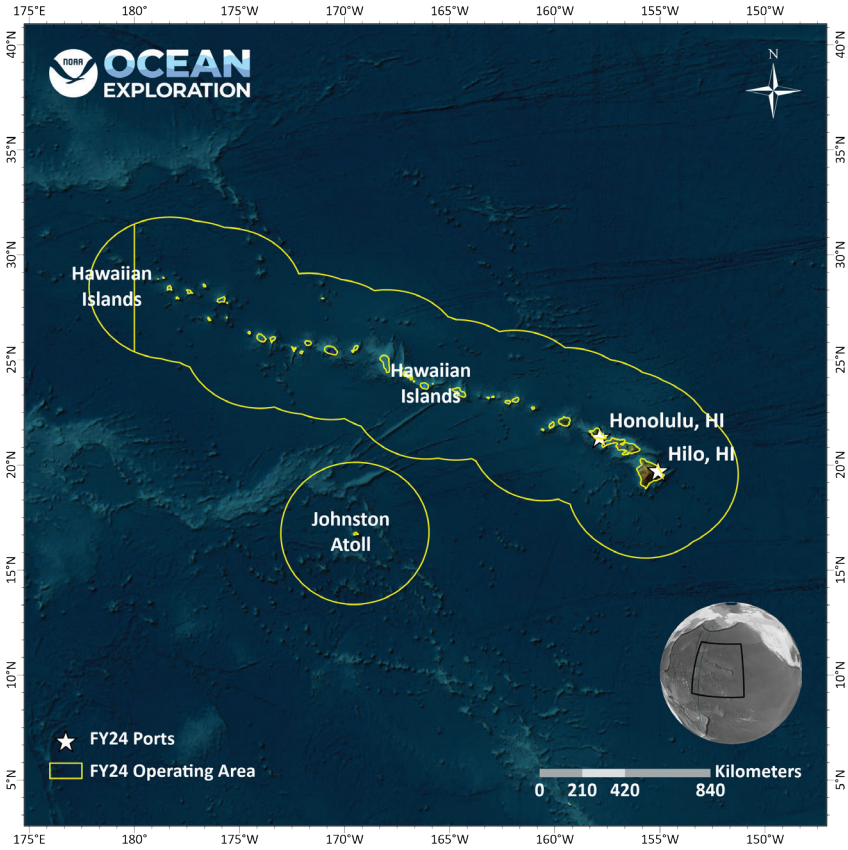
2024 Hawai'i and Johnston Atoll Overview

(EX2401, EX2402, EX2403, EX2404, EX2405, EX2406, EX2407)

OVERVIEW

From April 2024 through October 2024, NOAA Ocean Exploration and partners will conduct a series of telepresence-enabled ocean exploration expeditions on NOAA Ship *Okeanos Explorer* to improve knowledge about unexplored and poorly understood deepwater areas of Hawai'i and Johnston Atoll. Data collected will establish a baseline in these areas to catalyze further exploration, research, and management activities in the region.



Anticipated extent of the Fiscal Year 2024 operating area. Conducted expeditions will provide high-resolution information about seafloor features and associated marine habitats and an opportunity for scientists, students, and managers to engage in exploration of largely unknown areas in real time.

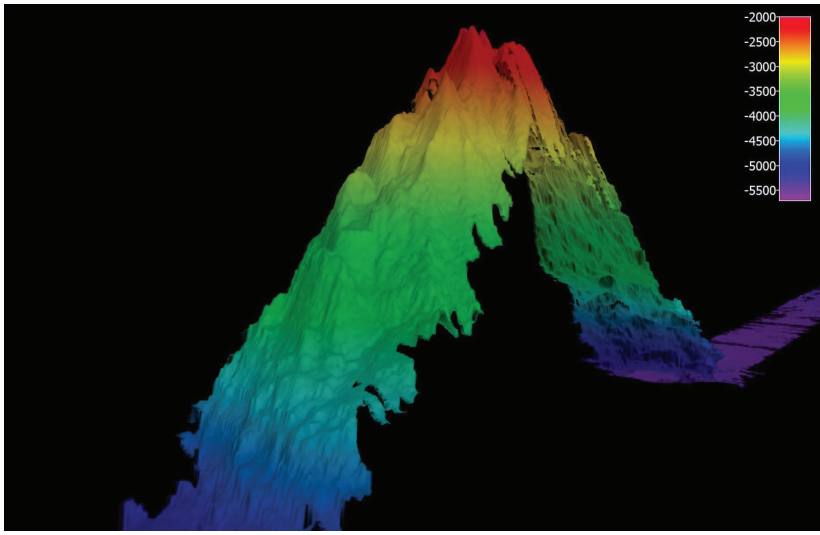
The waters in this region span a diverse range of ecosystems and dynamic geological environments, and are home to cultures with long histories of ocean voyaging and exploration. They contain some of the last relatively pristine marine ecosystems on the planet and harbor numerous protected species, as well as undiscovered shipwrecks and cultural landscapes sacred to the Indigenous peoples of the Pacific. The biological, ecological, cultural, and geological significance of these areas has led to the designation of marine protected areas, including the Papahānaumokuākea Marine National Monument and the Pacific Remote Islands Marine National Monument.

These regions were identified as a geographic priority area during the 2020 Consortium for Ocean Leadership Workshop to Identify National Ocean Exploration Priorities in the Pacific and were added to the Strategic Priorities for Ocean Exploration and Characterization by the Interagency Working Group on Ocean Exploration and Characterization. There is still much to be learned about the deep-ocean environment in this region and its geological and biological systems and how they influence each other.

As we increasingly look to the deep ocean for the resources it holds and the services it can provide, more data are needed so we can sustainably manage and protect it. There is a lot of ocean to explore, but exploration in one area can help us better understand similar habitats in other areas and the biodiversity and ecological processes that these habitats support. Exploration also contributes to our understanding of the geological history and processes, including geohazards, of the planet as a whole.

This series of expeditions will contribute to a multiyear, multipartner cooperative research and exploration campaign in U.S. and international waters throughout the remote Pacific Islands. Data and information collected during the *Beyond the Blue: Illuminating the Pacific* campaign are intended to expand the footprint of coastal and ocean mapping, exploration, and characterization throughout the Pacific Islands region. Throughout the duration of *Beyond the Blue*, NOAA Ocean Exploration and campaign partners will work to create and maintain meaningful relationships to improve collaboration across the U.S. government, with Indigenous communities, and local stakeholders through thoughtful engagement, inclusive collaboration, and public-private partnerships. Building upon previous work in the region, including the 2015 - 2017 Campaign to Address Pacific monument Science, Technology, and Ocean NEeds (CAPSTONE) and work sponsored by NOAA Ocean Exploration through the NOAA Ocean Exploration Cooperative Institute (OECI), this campaign is intended to provide a foundation of publicly accessible information relevant to a variety of sectors and communities, all with the aim of building our collective knowledge of the Pacific Islands region.

A scorpion fish, seen next to a mushroom coral, observed at 460 meters (1,509 feet) depth during the Deep-Sea Symphony: Exploring the Musicians Seamounts (EX1708) expedition in 2017 as part of the Campaign to Address Pacific monument Science, Technology, and Ocean NEeds (CAPSTONE).



Seamount mapped on the return voyage to Honolulu, Hawaii, during the Mountains in the Deep: Exploring the Central Pacific Basin (EX1705) expedition in 2017.

Collectively, these expeditions will use *Okeanos Explorer*'s deepwater acoustic systems (Kongsberg EM 304 multibeam sonar, Simrad EK60 and EK80 split-beam fisheries sonars, Knudsen 3260 chirp sub-bottom profiler sonar, and Teledyne acoustic Doppler current profiler), NOAA Ocean Exploration's dual-bodied deepwater remotely operated vehicle (ROV) system, and a high-bandwidth satellite connection for real-time ship-to-shore communications. Conductivity, temperature, and depth (CTD) rosette operations are also expected.

PLANNED EXPEDITIONS

NOAA and partners will conduct seven telepresence-enabled expeditions throughout Hawai'i and Johnston Atoll in support of *Beyond the Blue* during 2024. Live data from multibeam sonar mapping operations will be shared in real time with shore-based participants and the public. Expedition numbers, ports of call, and operational modes are as follows:

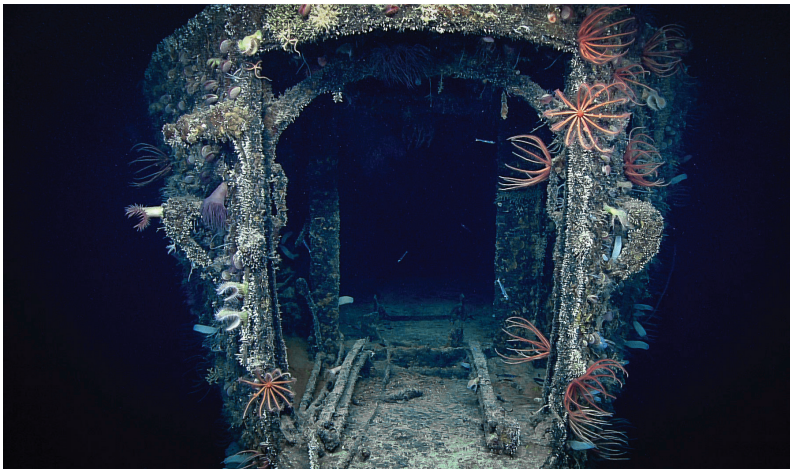
- **EX2401: April to May 2024, Vallejo, California, to Honolulu, Hawai'i:** Mapping shakedown expedition to test mapping systems and collect acoustic data of seafloor and sub-seafloor geomorphology in deep water between the U.S. West Coast and the Hawaiian Islands.

- **EX2402: May to June 2024, Honolulu, Hawai'i, to Honolulu, Hawai'i:** Mapping expedition in Hawaiian waters to collect acoustic data of seafloor and sub-seafloor geomorphology.

- **EX2403: June to July 2024, Honolulu, Hawai'i, to Honolulu, Hawai'i:** Mapping expedition to the Papahānaumokuākea Marine National Monument to collect acoustic data of seafloor and sub-seafloor geomorphology.

- **EX2404: July to August 2024, Honolulu, Hawai'i, to Honolulu, Hawai'i:** Mapping expedition to the Papahānaumokuākea Marine National Monument to collect acoustic data of seafloor and sub-seafloor geomorphology.

- **EX2405: August to September 2024, Honolulu, Hawai'i, to Hilo, Hawai'i:** Mapping expedition to explore deepwater areas of the Johnston Atoll unit of the Pacific Remote Islands Marine National Monument.



The stern of the USS *Baltimore*, which was used for laying sea mines during World War I, seen during the Deep-Sea Symphony: Exploring the Musicians Seamounts (EX1708) in 2017.

A large aggregation of brisingid sea stars seen during the 2016 Hohonu Moana: Exploring Deep Waters off Hawai'i (EX1504) in and around the Papahānaumokuākea Marine National Monument.

Rounded cobbles with an iron and manganese coating, potentially representing anancient beach where rocks were rounded by wave action. Seen during the Exploring Deep Sea Habitats Near Kingman Reef & Palmyra Atoll expedition aboard Exploration Vessel *Nautilus*. *Image courtesy of OET/NOAA.*

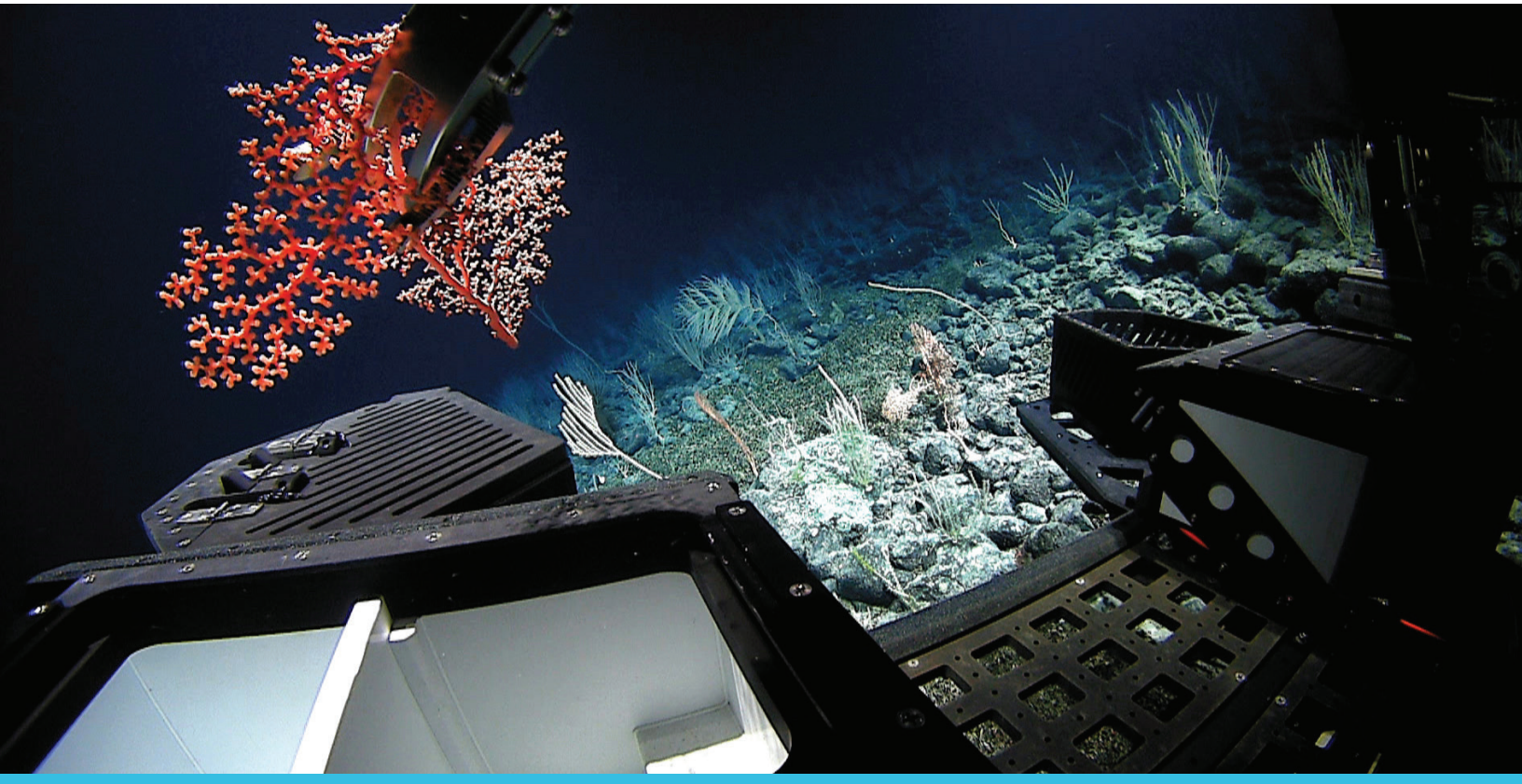
- **EX2406: September to October 2024, Hilo, Hawai'i, to Honolulu, Hawai'i:** Mapping expedition to explore deepwater areas of the Johnston Atoll unit of the Pacific Remote Islands Marine National Monument.

- **EX2407: October to November 2024, Honolulu, Hawai'i, to Honolulu, Hawai'i:** Mapping expedition to the Papahānaumokuākea Marine National Monument to collect acoustic data of seafloor and sub-seafloor geomorphology.

A diversity of deep-sea corals and sponges seen during the Ala 'Aumoana Kai Uli expedition expedition into the Papahānaumokuākea Marine National Monument aboard Exploration Vessel *Nautilus*. *Image courtesy of OET/NOAA.*

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. In subsequent years, ROV dives from 250 to 6,000 meters in depth are expected to explore deep-sea coral and sponge habitats, important areas for marine resources, fracture zones (and related geohazards), and the water column.

NOAA will incorporate the results of the 2024 call for input and priorities from resource managers to establish expedition objectives and refine the operating areas.



GOALS

NOAA priorities for the deep waters of Hawai'i and Johnston Atoll combine science, education, outreach, and open data to provide a better understanding of this important marine region. Specific goals include:

- Improve knowledge of unexplored deepwater areas in this region to inform management needs for sensitive habitats, geological features, and potential resources.
- Collect high-resolution bathymetry in areas with no or low-quality sonar data to extend bathymetric mapping coverage in support of the National Strategy for Mapping, Exploring, and Characterizing the United States Exclusive Economic Zone and Seabed 2030.
- Characterize water column habitats using acoustics and emerging technologies.
- Collect data to enhance predictive capabilities for vulnerable marine habitats, seafloor composition, seamount formation, plate tectonics, hydrothermal vents, critical minerals, and submarine geohazards.
- Investigate biogeographic patterns of deep-sea ecosystems and connectivity for use in broader comparisons of deepwater habitat throughout the Pacific basin and to better understand how these ecosystems are responding to climate change and other stressors.
- Map, survey, and sample geological features, including fault and fracture zones, hydrothermal vents, and extinct polymetallic sulfide systems to better understand the geological context of the region and improve knowledge of past and potential future geohazards.
- Engage a broad spectrum of the scientific community and public in telepresence-based exploration and provide publicly accessible information and data products to spur further exploration, research, and management activities.
- Conduct operations that are co-developed with Native Hawaiian researchers and community members, emphasizing culturally relevant and respectful approaches.

HOW TO GET INVOLVED

NOAA Ocean Exploration's expeditions onboard *Okeanos Explorer* are an open collaboration with the science community and local stakeholders, Indigenous communities, and resource managers. Throughout the field season, there will be a number of opportunities to collaborate in the expeditions. Video feeds and data will be streamed to shore in real time through the oceanexplorer.noaa.gov website, allowing for active engagement of interested participants from shore. Shore-side team members may participate in the expedition by providing input into the day-to-day operations of the ship, reviewing the latest data coming off the ship, and assisting in the generation of a standard suite of products. Participating scientists represent the broad interests of the marine science community, contribute to real-time annotation and data logging, and help identify and engage a community of explorers to contribute to the expedition from shore.

Information about *Okeanos Explorer*'s capabilities and how to participate in expeditions is available on the NOAA Ocean Exploration website. Individuals interested in actively participating and receiving updates about this series of expeditions should request a collaboration tools account. If you are interested in discussing specific details or have questions, please contact:

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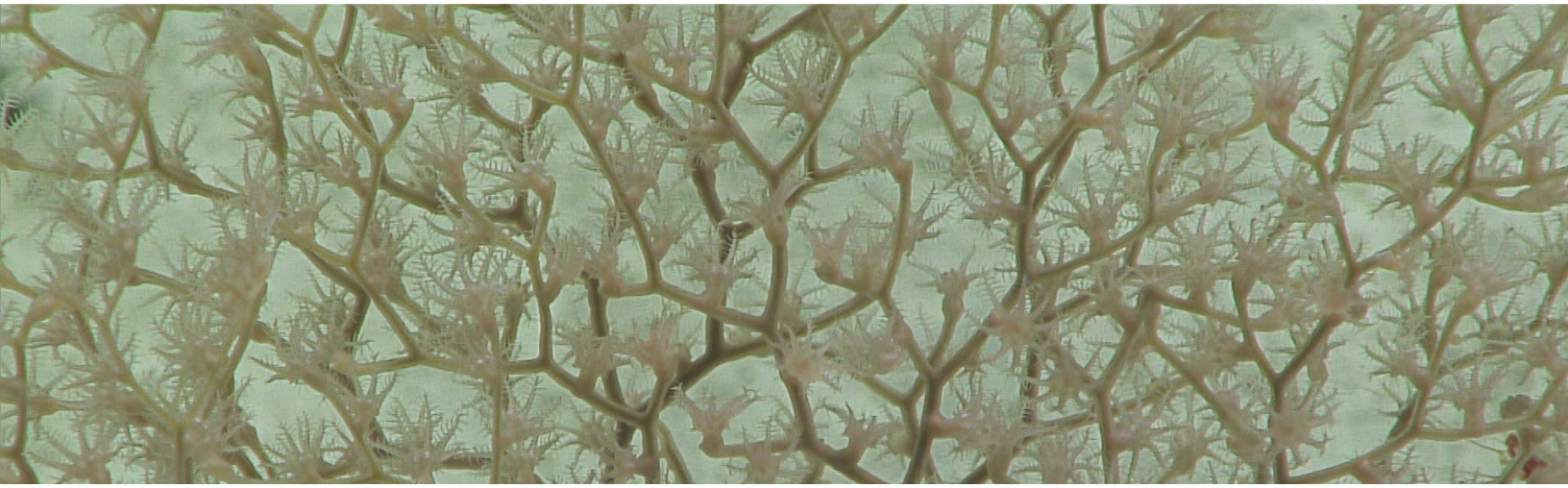

NOAA Ocean Exploration is dedicated to exploring the unknown ocean, unlocking its potential through scientific discovery, technological advancements, partnerships, and data delivery. We are leading national efforts to fill gaps in our basic understanding of the marine environment, providing critical ocean data, information, and awareness needed to strengthen the economy, health, and security of the United States and the world.

NOAA OCEAN EXPLORATION
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