Seafloor Mapping Offshore Howland and Baker Islands (NA166)

September 28-October 25, 2024

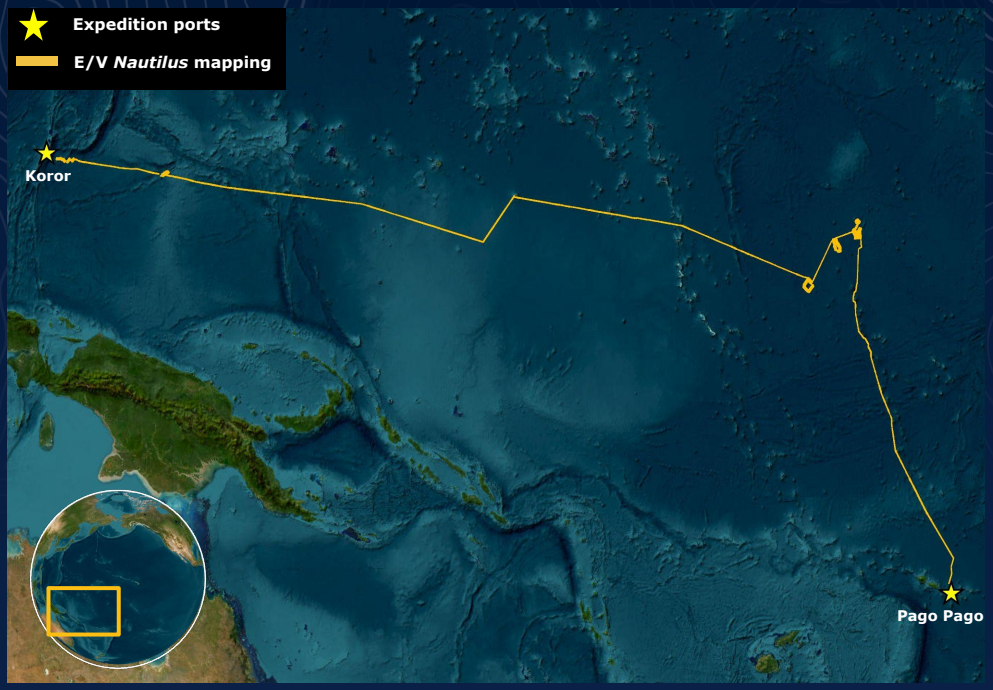
Geographic Focus: Howland & Baker Islands, and transit route between American Samoa and Palau

Main Operations: Seafloor mapping using ship-based sonars and topside marine fauna surveys

Sponsor: NOAA Ocean Exploration via the Ocean Exploration Cooperative Institute

Expedition Webpage: www.NautilusLive.org/cruise/NA166

- **26** days at sea
- **55,151** km^2 of seafloor mapped
- **360** hours of marine fauna surveys
- **1** educator sailed on expedition
- **4** students sailed on expedition
- **84** live ship-to-shore interactions
- **4,510** ship-to-shore participants
- **37,674** live stream views
- **4,451,159** social media views

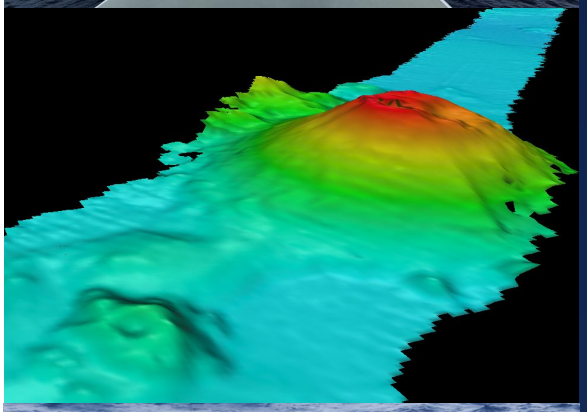


OVERVIEW

From September 28-October 25, 2024, E/V *Nautilus* conducted a telepresence-enabled expedition to map seafloor in the US Exclusive Economic Zone surrounding the islands of Howland and Baker, as well as other areas along the transit route between American Samoa and Palau. The expedition used E/V *Nautilus*' hull-mounted sonars to map large stretches of seafloor in six different countries across the Pacific, focusing on areas that had not been previously surveyed. In addition to mapping, the expedition included topside surveys for seabirds, mammals and other marine fauna from the observation deck on E/V *Nautilus*. Alongside technical experts, the expedition included the participation of students and educators via the OET Seafloor Mapping and Hydrography Internship Program, and the OET Science Communication Fellowship Program.

MAPPING SUMMARY

Over 55,151 km^2 of seafloor were mapped over the course of the expedition, including 11,484 km^2 in the US Exclusive Economic Zone around the islands of Howland and Baker, in an area that is being considered for the establishment of a new National Marine Sanctuary where seven different seamounts were mapped. In addition to dedicated mapping operations around the islands of Howland and Baker, the expedition included transit mapping operations covering 2,290 km^2 of seafloor in American Samoa, 6,800 km^2 in the Republic of Kiribati, 2,826 km^2 in Tokelau, 3,447 km^2 in the Republic of the Marshall Islands, 21,123 km^2 in the Federated States of Micronesia, and 1,974 km^2 in Palau. All of these data will be publicly archived, and contribute directly to Seabed 2030, the US National Strategy for Ocean Mapping, Exploration, and Characterization, and the Beyond the Blue: Illuminating the Pacific campaign.



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TOPSIDE MARINE FAUNA SURVEYS

In addition to seafloor mapping, the expedition included topside surveys on the abundance and diversity of seabirds and other marine animals. Surveys were conducted during daylight hours for a cumulative time of 360 hours, during which trained observers documented over 1,300 individuals from 29 bird species, including 26 species of seabirds, 2 species of shorebirds, and one species of landbird. Noteworthy records included Tropical Shearwaters, Bulwer's Petrels, Mottled Petrels, Leach's Storm Petrels, as well as large numbers of migrating Short-tailed Shearwaters. Furthermore, the topside fauna surveys documented five species of cetaceans, dolphins, manta rays, schools of tuna, flying fish, a turtle, and a black marlin.

ACKNOWLEDGEMENTS

Thanks to the captain and crew of E/V *Nautilus,* the Nautilus Corps of Exploration, the Ocean Exploration Trust, and all that supported the expedition from shore. The expedition was funded by NOAA Ocean Exploration via the Ocean Exploration Cooperative Institute, and executed under permits 2024-003 authorized by the Department of Marine and Wildlife Resources of American Samoa, 12543-24005 authorized by the US Fish and Wildlife Service, 2024-007 authorized by the Ministry of Foreign Affairs and Trade of New Zealand, 7/24 authorized by the Ministry of Fisheries and Marine Resources Development of the Republic of Kiribati, US86-24 authorized by the Republic of Marshall Islands Ministry of Foreign Affairs and Trade, FM24-VC20241RS-25421 authorized by the National Oceanic Resource Management Authority of the Federated States of Micronesia, and RE-24-17 authorized by the Palau Ministry of Natural Resources, Environment, and Tourism.

EDUCATION & OUTREACH

Live feeds from the expedition received 37,674 views, with expedition content posted OET's TikTok, Instagram, X, Facebook, and LinkedIn social media accounts garnering over 4.45 million impressions over the course of the expedition. While at sea, the team created seven new blogs with highlight images and background information, and hosted 84 live ship-to-shore interactions with schools, community events, and professional meetings, reaching over 4,510 people across 28 US States, American Samoa, Canada, and the United Kingdom. The expeditions included the participation of three student interns via the OET Seafloor Mapping and Hydrography Internship Pogram, and one educator via the OET Science Communication Fellowship Program. Throughout their time at sea, these students and educators obtained practical instruction on how to acquire, process, and archive data collected by the E/V *Nautilus* systems.

DATA ACCESS

All mapping and environmental data collected on this expedition have been sent to repositories for archiving and public distribution. Ship navigation, meteorological and seafloor mapping data have been sent to the Marine Geoscience Data System, and seafloor mapping data have been sent to the Rolling Deck to Repository, both of which provide gateways through which data are also cataloged in the NOAA National Centers for Environmental Information. Marine fauna observations will be summarized in a publicly-available report to the Secretariat of the Pacific Regional Environment Programme. Background information, highlight images, and educational materials are also available via the expedition website. These data sets are also available from OET upon request.