



NURP Voyage to the Aleutians: Understanding Alaska's Deep Sea Frontiers

Why investigate the Aleutians?

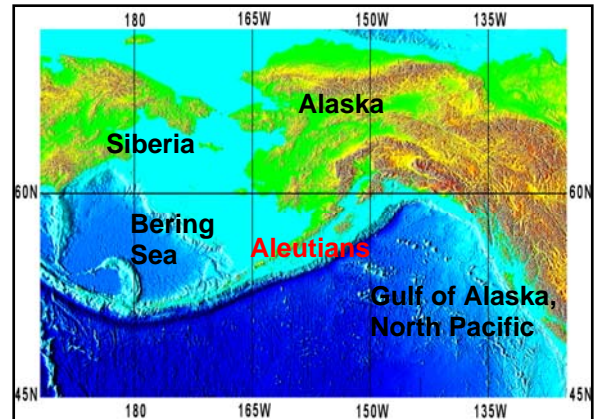
Located between the Bering Sea and North Pacific Ocean and situated over the boundary of two tectonic plates, Alaska's Aleutian Archipelago experiences frequent volcanic activity and earthquakes. Undersea mountain ranges, a deep ocean trench, and a vast array of marine life characterize much of the region's marine environment. The waters surrounding the Aleutian Islands contain the world's largest concentration of marine mammals and richest fishing grounds.

The Aleutians' remote location and severe weather patterns have hindered extensive research of its unique marine life and distinct marine geology. In 2004, NOAA's Undersea Research Program (NURP), through its West Coast and Polar Regions (WCPR) Undersea Research Center at the University of Alaska Fairbanks, funded a five week expedition to the Aleutian Islands and Gulf of Alaska to investigate the region's many undocumented features.

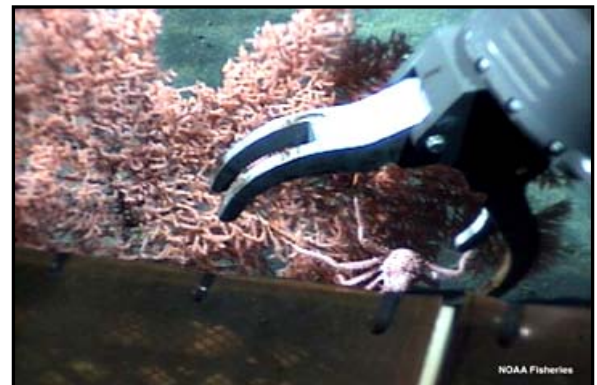
The scientific data collected on this expedition can potentially be applied towards management of the area's marine ecosystem, which experiences a heavy volume of commercial fishing. The Aleutians are home to the largest fishing port in the United States, Dutch Harbor, which for the past 15 years has held the top slot for fish and shellfish landings.

Cruise Logistics

The crew departed Dutch Harbor on July 10, 2004 aboard the Scripps Institution of Oceanography's R/V *Roger Revelle*, which was equipped with a deep-sea camera system, a multibeam sonar system, and *Jason II*, a remotely operated vehicle capable of diving to a depth of 6,500 meters (21,320 feet). During the second half of the expedition, the crew provided live updates via the Alaska Fisheries Science Center's website: <http://www.afsc.noaa.gov/abl/MarFish/coralscruise.htm>.



Jason II is brought aboard the *Revelle*. Tanaga Island, Aleutians. Photo: Tom Bolmer, Woods Hole.



Jason II's manipulator arm closes in on black coral and deepwater king crab at 2160 m. Amlia Island, Aleutians, Photo: NOAA Research

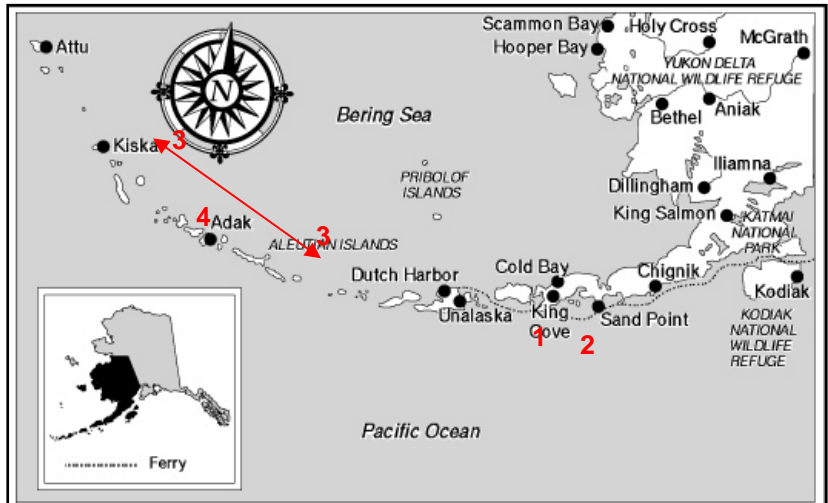
Research

The expedition's four science teams conducted investigations and gathered data pertaining to the Aleutians' deep-sea corals, deep-sea canyons, seamounts, submarine landslides and tsunamis.

At a **submarine landslide**, Dr. Anthony Rathburn's team (1 (see map below)) investigated the biota recovery that follows a major seafloor disturbance. Research results may be applied towards management of the margin ecosystems associated with such major disruptions. Drs. Gerard Fryer and Jonathan Martin (1) collected sediment samples at the Ugamak Slide to determine if it was of the right age and sufficient magnitude to generate the Pacific-wide tsunami of 1946, which killed 167 people.

To understand the origin and evolution of seamounts, or undersea volcanoes, Dr. Randall Keller and colleagues (2) investigated two **ancient seamounts** to determine if new volcanic eruptions and venting of fluids occur as the seamounts move toward the Aleutian Trench. Dr. Amy Baco-Taylor (2) collected data to determine the distribution of **deep sea gorgonian corals** on seamounts at depths below 2700m. To date, deep-sea corals in the region had been documented to a depth of only 350 m.

Led by NOAA biologist Dr. Robert Stone (3), scientists investigated an extensive portion of the Aleutians at a depth range of 350 m to 2950 m to identify the existence and distribution of **deep sea coral gardens** and **associated fish species**. The goal, to construct a model that predicts the distribution of coral habitat throughout the central Aleutians, may be applied towards management of the region's fisheries and corals. To understand the relationship between continental crust and juvenile island crust, which have strikingly different rock compositions, Dr. Gene Yogodzinsky and colleagues (4) collected samples from the walls of **Adak Canyon**, which offers deep exposures of island crust.



The Aleutians archipelago. Red numbers indicate data collection sites.

Archived data and fisheries bycatch specimens suggest the Aleutians may harbor the world's greatest abundance and diversity of cold-water corals, a type of coral that thrives in deeper, cooler waters.



Left: Deep-sea coral and sponge gardens, 160 m. Plumose hydroid is in center, bright orange. A gorgonian coral within yellow demo sponges is at far right. Adak Island, Aleutians. Photo: Alberto Lindner, NOAA Fisheries.

For further information contact:
Jennifer R. Reynolds, WCPR Science Director
NOAA/NURP, Fairbanks
jreynolds@guru.uaf.edu



Barbara Moore, NURP Director
1315 East West Highway, R/NURP
Silver Spring, MD 20910
Barbara.Moore@noaa.gov