

# Papahānaumokuākea Marine National Monument

## Deep Water Habitat Research

### Management Issue

A vast majority of the Papahānaumokuākea Marine National Monument (PMNM or Monument) encompasses habitats beyond depths accessible to researchers using conventional SCUBA (>100 feet). Relatively little is known about these deep water habitats or the organisms that populate them, despite the large area of the Monument that they represent. More information is necessary to establish biodiversity baselines found at greater depths in order to effectively manage and protect them.

### Description

The Census of Coral Reefs (2006) and annual Northwestern Hawaiian Islands Reef Assessment and Monitoring Program expeditions (between 2000 and 2006) revealed many previously unreported and undescribed species of reef invertebrates and corals. This work was conducted entirely within the shallow areas of the monument. These areas are relatively well-explored and still they have not been sufficiently surveyed. It is therefore certain that in deep water habitats, where to date relatively little work has been undertaken, explorations will reveal many discoveries.

Initial efforts in this realm confirm that such discoveries do exist: in 2007, the PMNM sponsored submersible dives which found not only new species but five new genera of deep octocorals. And in 2009 the first research expedition to PMNM to implement deep water diving surveys of fish revealed 17 new records for the NWHI and resulted in the collection of one undescribed species. Clearly additional explorations and analyses are needed to adequately characterize and document these deep-water habitats. In addition, surveys and explorations to date have yet to adequately characterize the actual degree of endemism in the Northwestern Hawaiian Islands. Up to 25 percent of the shallow-water organisms found in the Hawaiian Islands are endemic. It is unknown what level of endemism occurs in deep-water habitats.



*Advances in technology, such as this manned submersible, allow for the exploration of the deep coral reefs. Recent expeditions have found many new species, indicating that we are just beginning to understand this vast unexplored habitat. Photo credit PMNM*

### Questions and Information Needs

- 1) What are the different deep water habitat types in the Monument?
- 2) What is the range and extent of those deep-water habitat types?
- 3) Do human activities or climate change impact these habitats?
- 4) Which habitat types are most critical to protect?
- 5) Are there Habitat Areas of Particular Concern or Essential Fish Habitat designated habitats within the deep waters of the monument?
- 6) How do the deep water ecosystems interact with the shallow water ecosystem?
- 7) How do protected species utilize deep water habitats?

### Scientific Approach and Actions

- Conduct workshop to determine data availability, methodologies, and select sites for additional research
- Develop deep water habitat classification scheme for the monument
- Collect bathymetric data (including backscatter) for all deep-water habitats within the Monument
- Ground truth bathymetric data
- Analyze human use information relative to deep-water habitat to determine if any management actions are necessary to protect resources
- Conduct assessments of biodiversity and connectivity

*Updated: 5/1/2010*

*For More Information -- <http://www.sanctuaries.noaa.gov/science/assessment>*

## Potential Key Partners and Information Sources

University of Hawai'i's Hawai'i Institute of Marine Biology; Hawai'i Undersea Research Lab; School of Ocean and Earth Science Technology; NOAA Office of Ocean Exploration; NOAA/NMFS/PIFSC; State of Hawaii, DLNR

## Management Support Products

- Develop habitat map from ground-truthed bathymetric data
- Develop GIS analysis tool that can be used to determine if further protection may be warranted
- Develop species list for deep water habitats

## Planned Use of Products and Actions

- Utilize information collected on deep-water habitats to develop education and outreach products that inform the public of the marine resources of these areas
- Utilize habitat maps to inform monk seal foraging efforts, areas of high biodiversity and areas for future research



*Deep water primnoids, found in the Northwestern Hawaiian Islands. Photo credit: Amy Baco*

## Program References

### PMNM Management Plan

- Action Plan 3.1.1 Conservation Science
  - Strategy MCS-1: Continue and expand research, characterization and monitoring of marine ecosystems for the life of the plan
- *Other Action Plans:*
  - 3.2.1 - Threatened and Endangered Species
  - 3.2.2 - Migratory Birds
  - 3.3.2 - Alien Species
  - 3.5.1 - Agency Coordination
  - 3.6.2 - Information Management
  - 3.6.3 - Coordinated Field Operations

### PMNM Condition Report

- Sea habitats are still largely unexplored: Question 9.

### Other Documents

- Monument Goals 1, 2, 3, 4 and 5

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