

# Papahānaumokuākea Marine National Monument

## Water Quality

### Management Issue

Prior human activities on the Northwestern Hawaiian Islands have resulted in a variety of contaminants that remain in and around the islands. Managers need to understand the extent and impacts of these land-based sources of contamination to the marine resources of the Papahānaumokuākea Marine National Monument (PMNM or Monument).

### Description

Past uses of the Northwestern Hawaiian Islands have left a legacy of contamination on many of the atolls. The Northwestern Hawaiian Islands have hosted an array of polluting human activities including guano mining, fishing camps, U.S. Coast Guard LORAN stations, various Cold War military missions, and U.S. Navy airfields and bases. Contamination at all these sites includes onshore and offshore debris such as batteries (lead and mercury), PCB-containing transformers, capacitors, and barrels of petroleum and other chemicals. Many of the common contaminants biomagnify so that small amounts found in sediment can result in significant concentrations in upper trophic levels.



*Photo: Tern Island, French Frigate Shoals, is one of the islands in the NWHI that has seen heavy past human use and still has land contamination. Photo credit: James Watt*

Several areas of contamination have been identified in the Northwestern Hawaiian Islands and include the following (Friedlander et al. 2005)

- Kure and French Frigate Shoals both have point sources of PCBs due to former U.S. Coast Guard LORAN stations. While the U.S. Coast Guard has mounted limited cleanup actions at both sites, contamination remains and is found in island soils and in nearshore sediments and biota.
- Tern Island, a part of the French Frigate Shoals atoll, was formed into a runway to serve as a refueling stop for planes en route to Midway during World War II and served as the site of various Cold War missions. Leaking underground storage tanks were a source of petroleum contamination until removed by the Army Corps of Engineers.
- The U.S. Navy built a naval air facility and submarine base at Midway Atoll and during base reduction and closure identified and cleaned up numerous sites contaminated with petroleum, pesticides, PCBs and metals. While most known areas were remediated, several areas, including unlined eroding landfills, warrant continued monitoring for potential releases.
- Plutonium from the aboveground nuclear tests in the 1960s at Johnston Atoll has been detected in corals 700 miles to the north at French Frigate Shoals

### Questions and Information Needs

- 1) Which locations within the Monument contain land-based contaminants that are measurable within surrounding waters?
- 2) When land-based contaminants are measurable in surrounding waters where is there also a corresponding measurable impact to marine organisms?
- 3) For those areas where land-based contaminants are measurable in the surrounding waters, what mitigation options are available to address the contamination?

*Updated: 5/1/2010*

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

## Scientific Approach and Actions

- Collect water samples around all known land-based sources of contamination to determine if water quality is being impacted
- Collect samples of marine life expected to be impacted by land-based sources of contamination to determine extent and level of contamination
- Using above information, determine priority areas for potential clean up or mediation activities

## Potential Key Partners and Information Sources

US Fish and Wildlife Service: Information on location; State of Hawai'i: Information on location; US Military; US Coast Guard: Logistical removal assistance

## Management Support Products

- Produce reports and scientific papers
- Presentations at scientific meetings and conferences
- Utilize field data to determine priority response locations

## Planned Use of Products and Actions

- Initiate clean up of areas of highest concern
- Restrict human activities in areas of concern
- Mitigate any affect on wildlife by restricting access to contaminated area, creating new habitats or otherwise limiting exposure

## Program References

### PMNM Management Plan

- Action Plan 3.2.3 Habitat Management and Conservation
  - Strategy HMC-2: Within 10 years, investigate and inventory sources of known contamination from historic human uses of the NWHI and, where appropriate, coordinate with responsible parties to develop plans and complete cleanup actions.
- Action Plan 3.2.2 Migratory Birds
  - Strategy MB-2: Minimize the impact of threats to migratory birds such as habitat destruction by invasive species, disease, contaminants (including oil) and fisheries interactions for the life of the plan.
- *Other Action Plans:*
  - 3.1.1 - Marine Conservation Science
  - 3.5.1 - Agency Coordination
  - 3.6.2 - Information Management
  - 3.6.3 - Coordinated Field Operations

### PMNM Condition Report

- Question 7 and Question 8 both reference the impacts of contamination on water quality

### ONMS Performance Measures

- Number of sites in which water quality, based on long term monitoring data, are being maintained or improved.

### Other Documents

- Links to Monument Goals 1, 2, 3 and 5

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