

# National Marine Sanctuary of American Samoa

## Resource Characterization and Monitoring

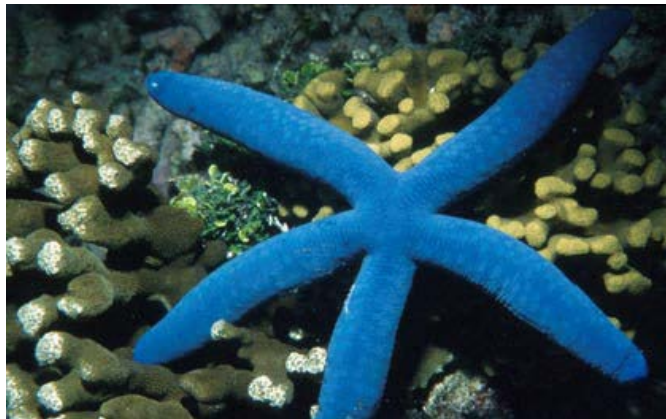
### Management Issue

The status and spatial distribution of the physical, biological and cultural resources of the National Marine Sanctuary of American Samoa (NMSAS or Sanctuary) need to be further described and monitored so that they can be effectively managed.

### Description

A great deal of comprehensive mapping of geological features and benthic biological assemblages has been done in American Samoa, however there is still a need for finer scale resolution in mapping in the sanctuary. Largely due to logistic and operational constraints, past and current monitoring activities occur in the day-time and account for benthic sessile and few mobile shallow water species. There is substantial information lacking for nocturnal, mesophotic and deepwater resources. Surveys that collect information on abundance, population, benthic community structure and cover; and feeding and reproductive behaviors need to be done.

Additionally, because coral reefs are dynamic and change not only due to disturbance but also because of general ecological processes, concurrent monitoring is a necessity to understand the status of these marine resources.



*Blue sea star on Porites sp. coral. Photo credit: Kip Evans*

### Questions and Information Needs

- 1) For previously unmapped areas, what are the existing habitats, shallow and deep water and what is the extent of each?
- 2) What are the physical characteristics associated with those habitats?
- 3) How are the habitats changing over time?
- 4) Are there areas that are sensitive to human activities?
- 5) Are there high biodiversity areas?
- 6) What are the current populations of key species?
- 7) Which are essential habitats for spawning and juvenile recruitment?
- 8) What are the temporal and spatial patterns of spawning and juvenile recruitment activities?
- 9) What are the ecosystem trophic level interactions?
- 10) What is the status of water quality?

### Scientific Approach and Actions

- Collect complete bathymetry of deep and shallow water areas using LIDAR and multi-beam sonar
- Collect point survey observation data for physical, biological and cultural resources
- Map, characterize and assess coral reefs and their associated habitats
- Compile existing data sets of surveys and monitoring data and determine compatibility and limitations
- Analyze monitoring data to determine changes in the environment
- Assess population levels and biodiversity of key species
- Analyze biological life histories layered with species distribution to determine temporal reproductive sensitivity
- Study physical oceanography and genetic connectivity to understand the role of source and sink of larval resources
- Model trophic interactions
- Use advanced technical diving and drop camera technology to complete deep water mapping

*Updated: 5/26/2011*

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

## Key Partners and Information Sources

Hawai'i Institute of Marine Biology; NOAA/NMFS/PIFSC/Coral Reef Ecosystems Division; NOAA/NMFS/PIFSC/CRED/Pacific Benthic Habitat Mapping Program; NOAA/NMFS/Pacific Islands Fisheries Center; NOAA/NOS/National Center for Coastal Ocean Science; NOAA/NMFS/PIRO, US Fish and Wildlife Service; US Geological Survey/Biological Resources Division; USGS/BRD/National Biological Information Infrastructure/Pacific Basin Information Node; Territorial Government of American Samoa, American Samoa Department of Marine and Wildlife Resources, The National Park Service of American Samoa

## Management Support Products

- Temporally and diurnally referenced benthic dataset & habitat use map
- Ecosystem models
- Enhanced physical maps
- Particularly sensitive areas marked for targeted monitoring

## Planned Use of Products and Actions

- Species/habitat modeling; climate change modeling; impact analysis; decision support tools
- Management access to data in a form that is easily used and can be tailored to specific management questions
- Enhanced development of education and outreach products

## Program References

### NMSAS Management Plan

- Action Plan 4.1 Marine Conservation Science
  - Strategy MCS-1: Continue and expand research, characterization and monitoring of marine ecosystems for the life of the plan.
  - Strategy MCS-3: Conduct population assessments and identify temporal marine zoning needs and assess biogeographic conditions within five years
  - Strategy MCS-4: Continue to map and characterize habitats and the associated physical properties within three years
  - Strategy MCS-5: Continue to enhance research and monitoring programs throughout the life of the plan



*Acropora hyacinthis* tabletop corals. Photo credit: Kip Evans

### FBNMS Condition Report

- These activities will support all questions of the NMSAS Condition Report

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