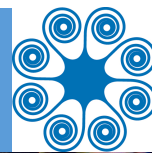


# Rapid Vulnerability Assessment and Adaptation Strategies for the National Marine Sanctuary and Territory of American Samoa



## ***Project Goal and Objectives:***

The overarching goal of this project is to assess regional vulnerabilities of natural resources and ecosystem services to climate change and to develop adaptation actions for the National Marine Sanctuary and Territory of American Samoa.

## ***Background:***

The ocean systems and the interdependent lives and economies that are protected by our National Marine Sanctuaries are affected by diverse and compounding stresses. These include marine debris and pollution, human development, fishing practices, climate change, and ocean acidification. Sanctuary planning and management help to ensure that the natural systems on which marine life and human communities depend are healthy and sustainable for generations to come despite these far-reaching stressors. Resource managers often recognize the threats climate change poses to the resilience, health, and ecosystem services of the special coastal and ocean places they protect, yet are still struggling with how to develop appropriate management actions.

## ***Methods***

This project involved three steps of the Adaptation Planning Process (Figure 1):

1. **Identify Conservation Targets.** A survey was sent to experts to prioritize focal resources that are most valuable and potentially vulnerable to climate and non-climate stressors.
2. **Assess Vulnerability to Climate Change.** Convened a two-day workshop with village leaders, scientists, resource managers, conservation practitioners, and other stakeholders to collaboratively assess the vulnerability of 10 focal resources.
3. **Identify Management Actions.** Convened a two-day workshop with stakeholders, including those who participated in the first workshop, to use the findings of the vulnerability assessment to inform the development of climate-informed adaptation strategies and actions to conserve priority resources.

## ***Key Partners and Participants:***

- National Marine Sanctuary of American Samoa
- Sanctuary Advisory Council
- Village Leaders
- American Samoa Government
- Natural resource managers
- Private sector entities
- Non-governmental organizations
- Scientists

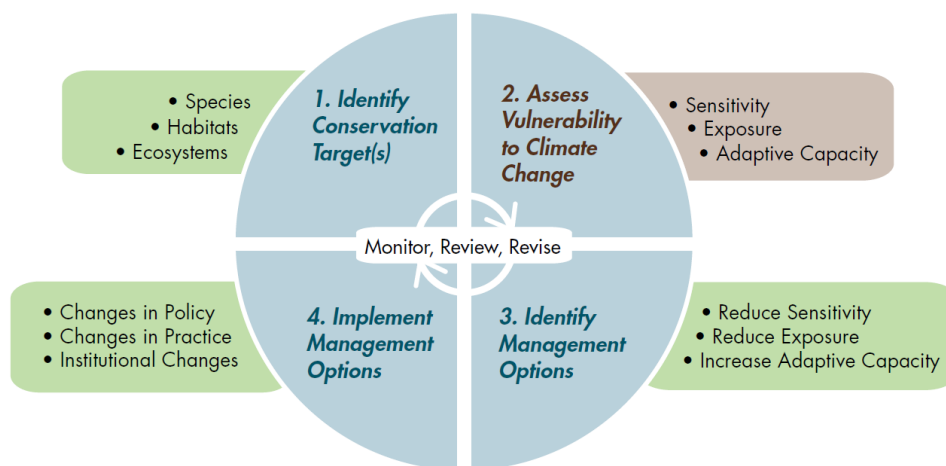


Figure 1. Adaptation Planning Process

### ***Vulnerability Assessment Results:***

Rankings for each vulnerability component (i.e., sensitivity, exposure, adaptive capacity) were then combined into an overall vulnerability score. The table below depicts the results of the vulnerability of the ten focal resources over the next 20 years<sup>1</sup> as well as confidence scores.

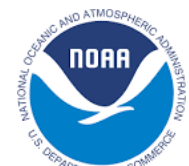
<b>FOCAL RESOURCE</b>	<b>VULNERABILITY</b>	<b>CONFIDENCE SCORE</b>
Coral Reef Habitat	Moderate	High
Mangrove Habitat	Low-Moderate	High
Water Quality	Moderate	High
Giant Clam	Moderate	High
Herbivore Reef Fish	Low-Moderate	High
Charismatic Reef Fish	Low-Moderate	High
Reef Piscivores	Low-Moderate	High
Pelagic Fish	Moderate	High
Sharks and Rays	Low-Moderate	Moderate
Sea Turtles	Moderate	Moderate

### ***Adaptation Strategy Development Results***

#### **Top Ranked Current and Future Climate-Informed Recommended Actions**

<b>RESOURCE</b>	<b>CLIMATE-INFORMED ACTIONS</b>
Coral Reef Habitat	<ul style="list-style-type: none"> <li>• Support sewer upgrades and expansions, new wastewater treatment plans, proper septic tank installation, and cesspit removal</li> <li>• Plant more trees/vegetation in coastal areas and in villages to reduce runoff</li> <li>• Select corals that do not bleach for restoration projects</li> </ul>
Mangroves	<ul style="list-style-type: none"> <li>• Increase use of stream catchments to catch debris</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>• Improve sewage effluent quality and sewage treatment (UV lights)</li> <li>• Increase public education and outreach</li> <li>• Pass and enforce anti-littering bill (currently under review by local government)</li> <li>• Find alternatives to untreatable/disposable pollutants</li> </ul>
Giant Clam	<ul style="list-style-type: none"> <li>• Create hatchery for clam stocking and genetic study of giant clams between different islands to diversify seed source Increase public education and outreach</li> <li>• Enforce and develop new harvest regulations to avoid overharvest</li> </ul>
Reef Fish	<ul style="list-style-type: none"> <li>• Utilize fishing regulations and ensure enforcement</li> </ul>
Sharks & Rays	<ul style="list-style-type: none"> <li>• Increase research to identify spawning/rearing critical habitat</li> </ul>
Sea Turtles	<ul style="list-style-type: none"> <li>• Engage village councils to enforce laws</li> <li>• Monitor turtles/eggs; satellite tagging to track migration routes</li> <li>• Create citizen science program to track turtle/nest presence</li> <li>• Increase education (importance of beaches and light use)</li> <li>• Use turtle-friendly street lights</li> </ul>

This project is funded by the National Marine Sanctuary Foundation and led by EcoAdapt with support of National Marine Sanctuary Program, Greater Farallones National Marine Sanctuary, and the National Marine Sanctuary of American Samoa.



<sup>1</sup> Participants selected the 20-year timeframe