

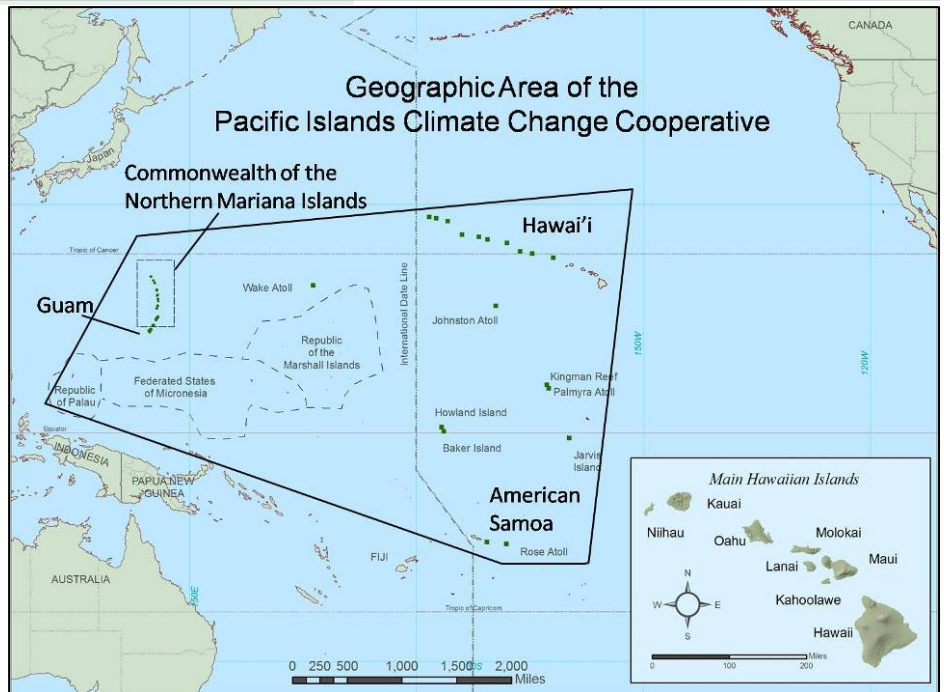


Climate Change in the Pacific

Human-caused changes in climate, ocean chemistry, and sea level will shape the Pacific and its islands in unprecedented ways. We anticipate changes in rainfall and freshwater availability, increases in wildlife diseases, the potential extinction of many rainforest species, degradation of coral reefs, and even the loss of entire low-lying islands. These changes will strongly affect island cultures and the natural resources they depend upon.

At risk are thousands of unique island plant and animal species, including 410 on the Endangered Species list; many inhabit only one island. Our network of protected areas, including 22 National Wildlife Refuges, 10 National Parks, 4 Marine National Monuments, and local and private conservation lands, provide refuge for many species. For them to flourish into the future, resource managers and the public need to know how ecological changes are likely to unfold, and what conservation actions will best perpetuate the unique natural resources of the Pacific.

To help fill this need, the Hawai'i Conservation Alliance (HCA) is facilitating establishment of the Pacific Islands Climate Change Cooperative



(PICCC). The HCA's long-established conservation leadership role provides a solid foundation for the PICCC to rapidly engage conservation managers, researchers, and the broader community in Hawai'i and the Pacific Island region.

The PICCC will provide a range of scientific and technical tools to help managers in Hawai'i, the Mariana Islands, American Samoa, and other island groups make informed decisions for landscape-scale conservation.

These tools will help managers reach explicit conservation objectives for native species and habitats in the face of climate change and ongoing threats such as fire, land conversion, and invasive species.

The PICCC steering committee is comprised of HCA members and

other key organizations, forming a cooperative partnership of Federal, State, private, indigenous, and non-governmental conservation organizations and academic institutions.

PICCC members to date:

- Hawai'i Conservation Alliance
- Hawai'i Division of Aquatic Resources
- Hawai'i Division of Forestry and Wildlife
- Hawai'i Wetland Joint Venture
- Kamehameha Schools
- National Oceanic and Atmospheric Administration
- National Park Service
- Natural Resources Conservation Service
- Pacific Science Association
- Office of Hawaiian Affairs
- The Nature Conservancy
- U.S. Army Garrison Hawai'i Natural Resources Program
- U.S. Army Corps of Engineers
- U.S. Geological Survey
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- University of Hawai'i



Palmyra Atoll, Pacific Remote Islands Marine National Monument. Ocean systems are at risk from rising temperatures, acidification, and sea level rise. Photo: J. Maragos/USFWS.

Functions of the PICCC

To meet the partnership goal, the PICCC will:

1. *Develop models* that predict how natural resources and processes may respond to climate change. The focus of modeling will be ecosystem-modifying invasive species; rare native species; common species that structure ecosystems; natural habitats such as bogs, coral reefs, or forests; and critical ecological processes such as nutrient or hydrological cycles.

2. *Assess management options using models and historical data*, and collectively determine priority conservation strategies. To make the link between modeling and management, the PICCC will assess the vulnerability of targeted species and ecosystems, and assist partners in choosing among potential management strategies based on their likelihood for success.



'Iwi, Hawai'i. Climate-related expansion of avian disease is a threat to forest birds. Photo: © Jack Jeffrey Photography.

3. *Validate ecological models and management actions* through research and coordinated monitoring. Experiments will be needed to clarify how native species respond to novel conditions. Strategic monitoring of responses to climate change and management actions will help refine models and decision-making in an adaptive management process.

4. *Provide a forum for continuous exchange, feedback, and understanding* among stakeholders, researchers, land managers, and communities. As a true



Kaena Point Natural Area Reserve, Hawai'i. Terrestrial systems are at risk from sea level rise, habitat loss, shifting habitat conditions, and expansion of invasive species and diseases.

partnership, the PICCC will serve the needs of its members, and will act as a hub of information, projections, and conservation design for any group or individual interested in conserving biodiversity in the Pacific Islands. Open public access to PICCC products will promote understanding and support of changes in conservation strategy.

PICCC Structure

Accomplishing these functions will require clear guidance and a dedicated staff. The PICCC partners will collectively determine the structure of the PICCC, the breadth of its activities, and the priority projects to be addressed by the staff.

HCA and its partners are supporting several key positions. The funding agency is indicated in parentheses.

- Cooperative coordinator (USFWS)
- Science coordinator (USFWS)
- Species modeler (USFWS)
- Landscape modeler (USFWS)
- GIS/data products specialist (USFWS-short term)
- Cultural resources planner (NPS)
- Hydrologist (USGS)
- Traditional knowledge expert (HCA)
- Administrative support (USFWS)

Additional expertise is still needed, especially in the following areas:

- Marine ecology
- Ecosystem modeling
- Social sciences
- Education and outreach
- Data management
- Monitoring

PICCC Products

PICCC will provide unique support for effective conservation in Hawai'i and other Pacific Islands. We will be working on a number of key products, including:

- Mapping potential ranges of native species and invasive species under future temperature and precipitation projections
- Publishing vulnerability assessments for rare species, native ecosystems, and keystone species.
- Developing web-based decision support tools for managers and the public.
- Predicting future potential community composition within protected areas under different climate scenarios.
- Identifying potential corridors linking present and future habitat.
- Recommending conservation and acquisition priorities based on future climate and sea level.
- Developing adaptation strategies to protect biodiversity and cultural heritage across the Pacific.

For more information, contact:

Jeff Burgett, Interim PICCC Coordinator, (808) 792-9400
Jeff_burgett@fws.gov

Or:

Deanna Spooner, Executive Director, Hawai'i Conservation Alliance, (808) 586-0916

spooner@hawaii.edu

