



PACIFIC ISLANDS  
CLIMATE CHANGE COOPERATIVE

# 2014-2015 Annual Report



## A Note from the PICCC Chairperson Emeritus

The years of 2014 and 2015 were transformative for the Pacific Islands Climate Change Cooperative (PICCC). During these years, the PICCC staff, Steering Committee, and working group members sought to shift the strategic paradigm and pursue a new direction to address climate change across the U.S.-Affiliated Pacific Islands.

The past two years saw the finalization of the PICCC Strategic Plan, which guides our collective efforts in the pursuit of facilitating climate adaptation and fostering partnerships over the coming years. The PICCC's members and partners actively guided the planning and development of the Strategic Plan and supporting programs.

We continued paradigm-shifting efforts through strategic Adaptation Initiatives that allow for the coordination of partner resources and efforts to support a management-driven approach to climate change adaptation. In 2014 and 2015, the PICCC laid the groundwork for three of these Adaptation Initiatives: one focused on terrestrial ecosystems of Hawai'i, and two more directed toward management efforts in the broader U.S.-Affiliated Pacific.

Several successful projects also saw their culmination over the past two years. The results of these projects already are informing planning and management activities by providing a sound scientific basis for addressing climate change impacts.

The PICCC also worked to connect with partners in the Pacific and throughout the world. Membership was bolstered and broadened to better integrate partners with diverse expertise and experiences that will guide the pursuit of effective adaptation.

This Annual Report highlights just some of the Cooperative's projects, activities and accomplishments for the years of 2014 and 2015. The staff, Steering Committee, and partners across the region set in motion activities that will continue to build resilience throughout the Pacific Islands in 2016 and for years to come.

Sincerely,

*Ric Lopez*

Director, U.S. Department of Agriculture Forest Service, Pacific Southwest Research Station, Institute of Pacific Islands Forestry  
2015 PICCC Chair  
2016 PICCC Chair Emeritus

*"...The PICCC will direct its efforts during the next five years to promote climate change adaptation involving ecosystem and human-ecological interactions by influencing targeted resource management plans and actions. These efforts will focus on specific islands or atolls in Hawai'i, American Samoa, Republic of Marshall Islands, Federated States of Micronesia, Commonwealth of the Northern Mariana Islands, Guam, the Republic of Palau, or within the Marine National Monuments."*

*-The PICCC Strategic Plan  
2014-2019*

## A New Direction: The PICCC Strategic Plan

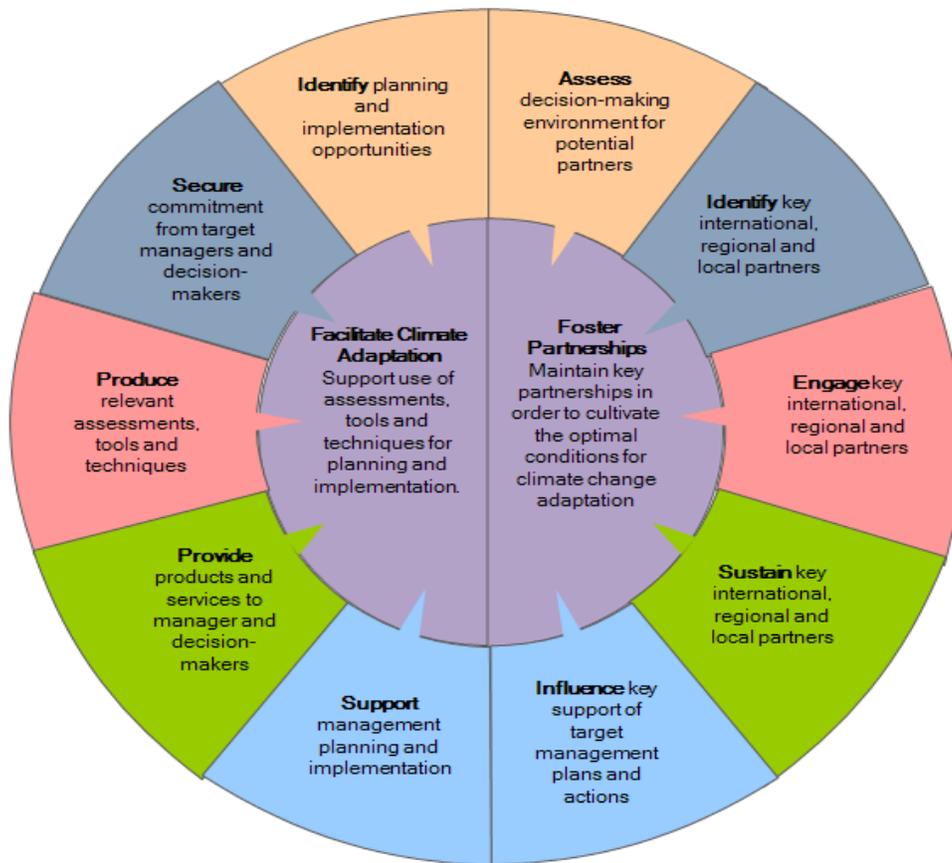
The Pacific Islands Climate Change Cooperative Strategic Plan was finalized and approved in 2014 by the Steering Committee. The Strategic Plan articulates the Steering Committee’s intent to strategically align the Cooperative’s programs and activities during the next 5 years to further assist and guide climate change adaptation within the US-affiliated Pacific.

The PICCC, along with its member organizations, articulated a Strategic Direction and established two goals to guide activities through 2019. This will provide the PICCC with ample opportunity to implement our strategic goals and evaluate the effectiveness of our strategy in pursuing climate change adaptation.

**Strategic Direction: Adaptation implemented for ecosystem functions and human-ecological functions in Hawaii and the U.S.-affiliated Pacific islands.**

Strategic Goal 1: Facilitate Climate Adaptation: The PICCC will support targeted managers and decision-makers in utilizing relevant assessments, tools, and techniques for resource management planning and implementation.

Strategic Goal 2: Foster Partnerships: The PICCC will maintain key international, regional, and local partnerships in order to cultivate the optimal conditions for climate change adaptation to occur.



This diagram demonstrates the two Strategic Goals (center, in purple) as well as major outputs for each goal, grouped into phases as follows: Assessment and Opportunity (in orange), Identification and Confirmation (in dark blue), Production and Engagement (in pink), Consultation and Visibility (in green), and Support and Influence (in light blue).

## Adaptation Initiatives

After the Strategic Plan was developed and finalized, staff and partners focused on the development and implementation of the PICCC's Adaptation Initiatives. These Adaptation Initiatives (AIs) provide for a new approach that allows the PICCC to coordinate and plan activities within discrete focal groupings that are not simply limited to science products but incorporate all related communication, consultation, evaluation, and coordination efforts.

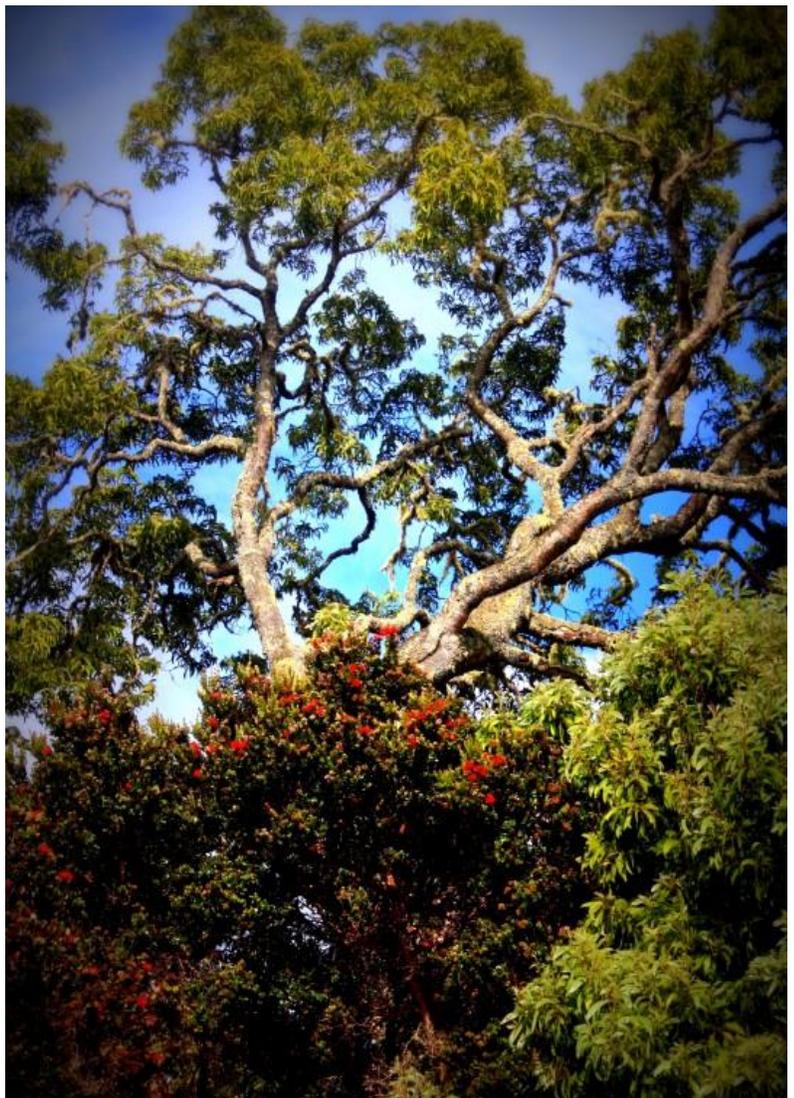
The AIs have been developed and implemented each year based on annual priorities and resource availability. The duration of each AI is dependent upon the individual needs of the selected resource manager or decision-maker to accomplish an adaptation plan or action.

### Hawaiian Islands Terrestrial Adaptation Initiative

The Hawaiian Islands Terrestrial Adaptation Initiative (HITAI) engages resource managers across each of the main Hawaiian Islands to integrate climate change science and information into planning and management efforts. In 2015, the PICCC, along with project cooperater EcoAdapt, set out to build the necessary information and establish reliable forums to achieve climate adaptation.

The HITAI incorporates a great deal of valuable information and products previously supported by the PICCC, the Pacific Islands Climate Science Center, and other partners, including downscaled climate projections for the main Hawaiian Islands and Vulnerability Assessments for plants and birds. The results of these previously funded projects inform scientific syntheses of current and future projected climate change impacts and adaptation options for terrestrial and freshwater resources within each of the main Hawaiian Islands.

In late 2015, the PICCC and EcoAdapt met with several federal and state partners in Hawai'i to introduce the HITAI objectives and identify any potential perceived obstacles to pursuing adaptation. The team also



*Hawai'i's forests are home to precious but endangered flora and fauna (Credit: Deanna Spooner, USFWS)*

identified members of a Stakeholder Working Group and held an initial meeting to assist in the identification of priorities for each island and management entity, potential focal experts to include in the climate adaptation workshops, and other informational needs.

Members of the Stakeholder Working Group include: State of Hawai‘i Department of Land and Natural Resources Division of Forestry and Wildlife, the U.S. Fish and Wildlife Service, the Pacific RISA, Kamehameha Schools, National Park Service, The Nature Conservancy, the U.S. Forest Service, U.S. Geological Survey, Kaho‘olawe Island Reserve Commission, U.S. Army Garrison Hawai‘i, and more.

### Adaptation Initiatives in the Broader Pacific

For developing the next two Adaptation Initiatives, the PICCC Steering Committee looked to address the needs of communities in the Western Pacific. These Initiatives allow us to partner on climate adaptation efforts at both local and regional scales.



*Mangroves provide critical environmental benefits, habitat and protection for the island ecosystem in Micronesia (Credit: Stefan Krasowski, Flickr)*

The **Micronesian Mangrove Adaptation Initiative** (MMAI) is intended to build local capacity on Pohnpei and throughout Micronesia to increase coastal and community resilience. By providing tools to determine climate change impacts and other stresses on mangroves, communities and local governments can plan adaptation actions to alleviate these stresses while maintaining the critical ecological and economic services of this important coastal ecosystem.

The PICCC is partnering and building on the work of several federal, local, and non-profit partners in Micronesia to accomplish this

effort, including the Micronesian Conservation Trust and the Conservation Society of Pohnpei. Technical

assistance is also being provided by The Nature Conservancy, U.S. Geological Survey, U.S. Forest Service, U.S. Fish and Wildlife Service, and the University of Tasmania.

The **Pacific Island Agroforestry Adaptation Initiative** (PIAAI) is intended to identify and improve the capacity of local agroecosystems to sustain food security and cultural ecosystem services under a changing climate. The goal of the PIAAI is to identify and promote locally relevant climate change education and adaptation opportunities within the agricultural sectors of the U.S.-Affiliated Island territories of American Sāmoa, Guam, and the Commonwealth of the Northern Mariana Islands. The PICCC is partnering with the University of Hawai'i's College of Tropical Agriculture and Human Resources and the Cooperative Extension Service of the Pacific Islands Land Grant Institutes to develop climate science literacy in each of the identified territories. The Department of the Interior's Office of Insular Affairs also provided funding for the PIAAI.



*Taro is a main staple of agriculture across the Pacific Islands (Credit: Christopher Hu, Flickr)*

## Project Highlights

As we worked to develop and implement our new Strategic Direction, multiple other projects were also being completed. The valuable insights and results from these projects will be incorporated into the PICCC's new strategic direction and Adaptation Initiatives. The years of 2014 and 2015 saw the completion of many projects for the PICCC, including those highlighted below:

- ✚ **Traditional Ecological Knowledge in Ka'upulehu:** With support from the PICCC, researchers at the University of Hawai'i at Mānoa and community members of Ka'upulehu, in the north Kona region on Hawai'i Island, co-developed tools and resources to document both baseline Traditional Ecological Knowledge and changes over time. This project focuses on the need for place-based observations to complement global climate change models by explaining in more detail how climate is changing locally, what the ecological and social impacts are, and how people



*This image represents all of the iconic natural and cultural resources in the Ka'upulehu community. For more information on this map, please visit the [University of Hawai'i at Mānoa portal](#).*

can adapt.

- ✦ **Projections of future distribution of cloud forests in Hawai'i:** Researchers provided insight into the future and potential movement of Hawaiian cloud forest ecosystem in response to projected warming and drying.
- ✦ **Future wind and wave projections for the Pacific islands:** Scientists used global models to better understand the changes in winds and waves and the ways in which this will impact erosion, damage to infrastructure, and freshwater supplies across the Pacific.
- ✦ **Landcover mapping in the Mariana Islands:** Scientists obtained baseline data about landcover in order to develop and refine predictive tools that can help guide the conservation of native species, communities, and ecosystems in rapidly changing island environments of the Mariana Islands.



Wave projections, landcover mapping, and cloud forest projections were just a few of the projects completed in 2014 and 2015. (Photo credits, left to right: Michelle Reynolds, USGS; US Pacific Air Forces; Miquel Viera)

## Examining Vulnerability in Hawai'i

How will climate change impact the flora and fauna in the state of Hawai'i? To answer this question, the PICCC team and our partners set out to expand upon the plant vulnerability research that began in 2013, while also exploring the future for Hawai'i's native forest birds.

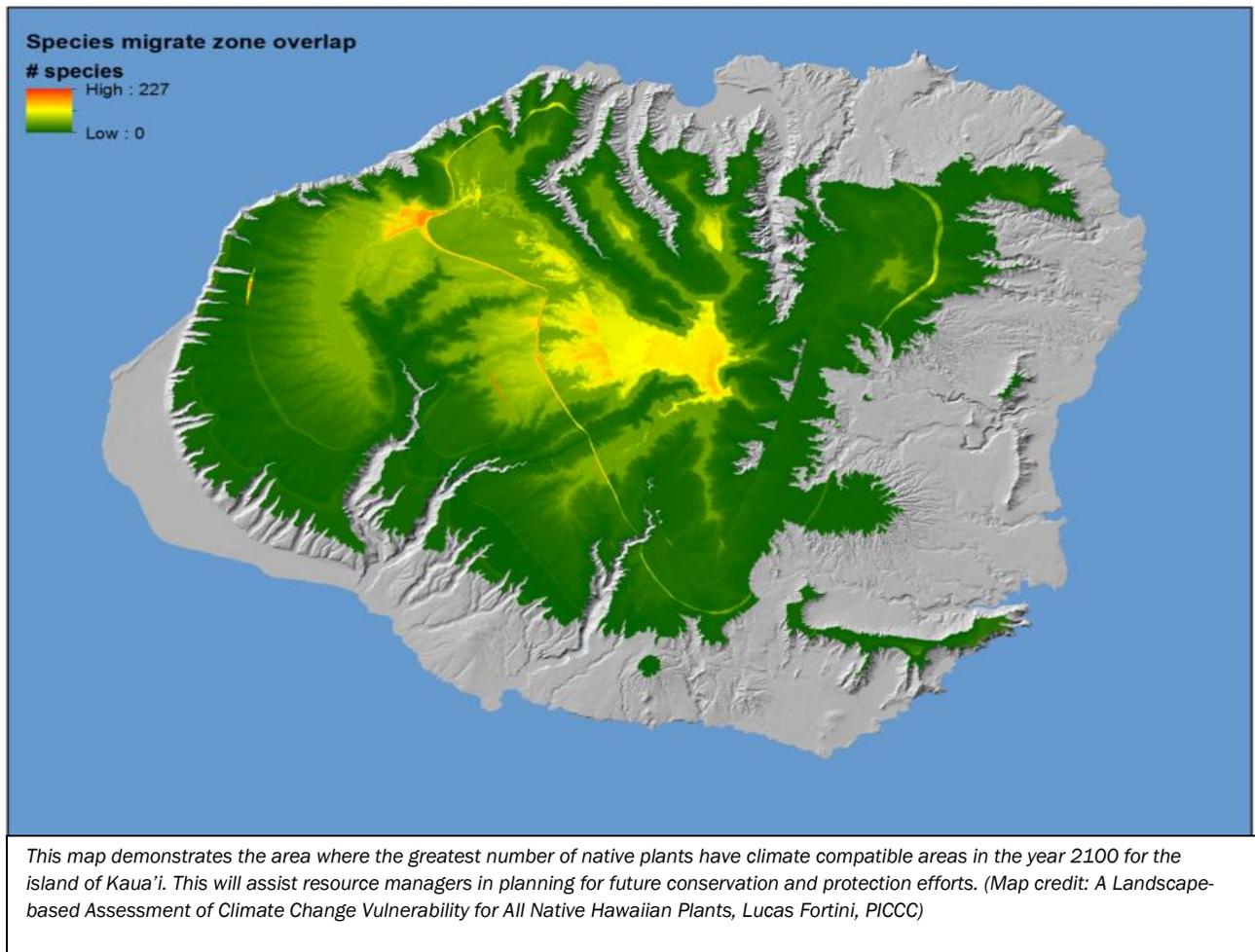
### Plant Vulnerability Assessment

The PICCC led an interdisciplinary team of scientists to complete what may be the largest vulnerability assessment ever for the US, estimating the likelihood and degree of climate change impacts on all native Hawaiian plants (over 1,000 species). This assessment found that by the year 2100, there is projected to be an overall 39% decrease in the area where native plants are likely to persist. But the scientists found that if habitat quality could be improved through key management actions, the number of climate vulnerable species would drop.



*Geranium arboretum* is just one native Hawaiian plant which is gravely threatened by climate change. (Photo credit: Forest and Kim Starr)

In 2014, the plant vulnerability assessment work was further developed and updated along with colleagues from the U.S. Fish and Wildlife Service, University of Hawai'i at Hilo, U.S. Geological Survey, The Nature Conservancy, and the U.S. Department of Agriculture Natural Resources Conservation Service. The group also made significant progress on modeling efforts to provide an initial approximation of overall expected vegetation changes in Hawai'i under future climate scenarios. This work underpinned discussions regarding restoration and habitat prioritization. Refinement of these efforts continue to be supported by the PICCC, Pacific Islands Climate Science Center, U.S. Geological Survey Pacific Islands Ecosystem Research Center, and U.S. Fish and Wildlife Service.



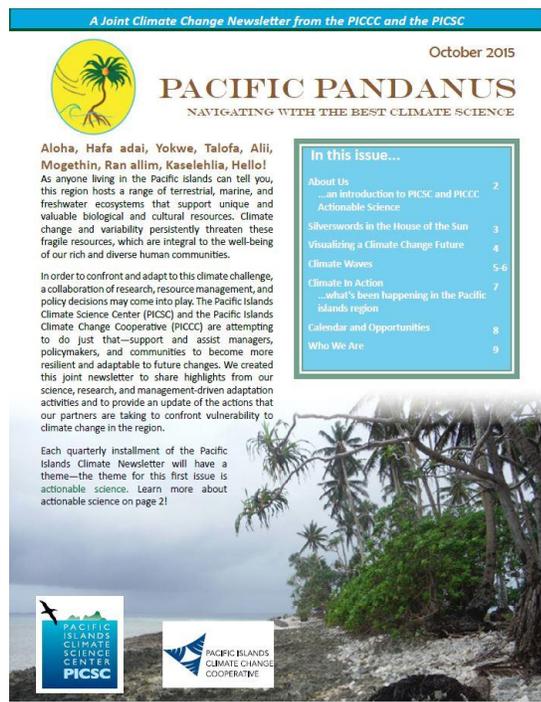
## Bird Vulnerability Assessment

Through the work of the PICCC Core team staff and partners throughout the state of Hawai'i and the federal government, a vulnerability assessment was completed that focused on native Hawaiian bird species. Native forest birds, a vital part of Hawaiian culture and ecosystems, have been under threat for many years due to habitat loss and degradation, predators, and disease. The research examined the impacts of temperature and precipitation shifts for each bird species and found that the ranges will likely be drastically reduced for all of the birds by 2100. Most of these are projected to have less than 100 square kilometers left of livable habitat by the end of the century. The authors concluded that the state of Hawai'i should begin looking at ways to avert some of the worst projected impacts by pursuing major collaborative efforts targeting protection, conservation, and recovery actions.



The l'iwi bird is a highly recognizable symbol of Hawai'i. (Photo credit: Noah Kahn, US Fish and Wildlife Service)

The [forest bird vulnerability assessment](#) research was published in [PLOS ONE](#) on October 2015, and was featured in various media outlets including the Honolulu Star Advertiser, Audobon Magazine, Frontiers of Ecology and the Environment, and Live Science. The PICCC staff also worked with partners including The Nature Conservancy and U.S. Fish and Wildlife Service to present the results of this work to natural resource managers in order to enhance the use of the data within conservation efforts.



## Communicating Climate Change

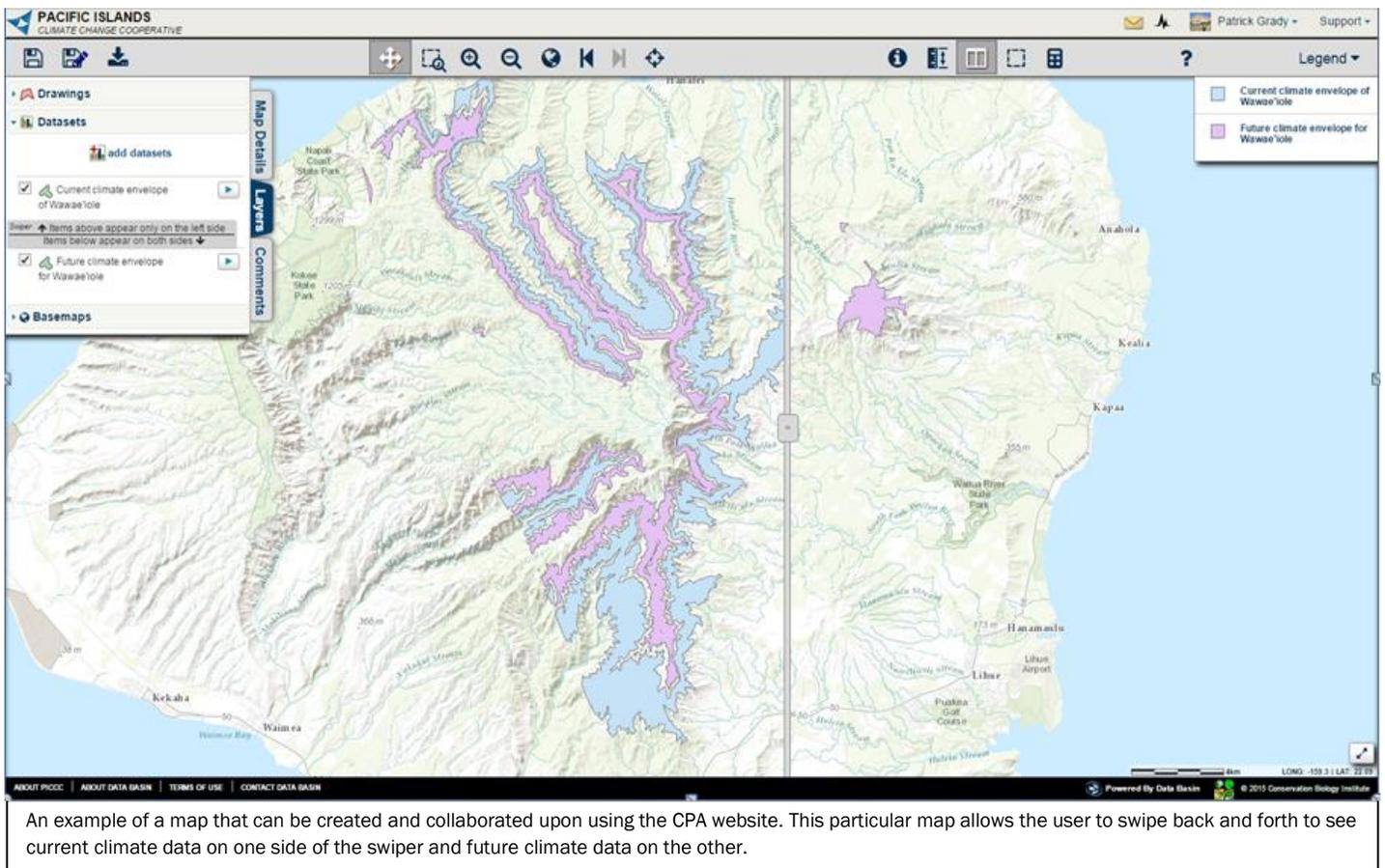
In early 2015, the PICCC released its Communications Strategy in support of our Strategic Plan. Over the intervening months, the PICCC staff completed several new projects designed to improve outreach and communications. These include:

- ✚ A [newly-designed website](#), that enables easy access to projects, events, and a blog for news items
- ✚ Social media accounts on [Facebook](#) and [Twitter](#)
- ✚ A new quarterly newsletter, [the Pacific Pandanus](#) (see photo, left), presented in partnership with the Pacific Islands Climate Science Center
- ✚ Two Story Maps, which help tell our stories in an informative and interactive way:
  - [The PICCC Project Story Map](#), displaying PICCC project information, locations, and essential data was released in conjunction with the new website.

- [The Forest Bird VA Story Map](#) focused on the forest bird vulnerability assessment and supported the outreach efforts of that project

## Making Science Accessible: the Conservation Planning Atlas

In 2014, the PICCC staff, the Data Working Group, and in the Conservation Biology Institute worked to develop the PICCC's [Conservation Planning Atlas](#) (CPA). The CPA is a collaborative data portal and workspace for PICCC members and others to visualize and plan management responses to the challenges posed by climate change. This online tool allows partners to access geospatial datasets, share data, and work collaboratively on projects within a secure environment via our website. The CPA allows users to share data safely while developing multi-partner management solutions.



## Organizational Growth

Last, but not least, the PICCC team grew to support our new strategic direction. Please reach out to us with your questions about the PICCC's programs and projects!

## PICCC Steering Committee

American Bird Conservancy  
Bernice Pauahi Bishop Museum  
Hawai'i Conservation Alliance  
Hawaiian Islands Land Trust  
Pacific Birds Habitat Joint Venture  
Kamehameha Schools, Land Assets Division  
Micronesian Conservation Trust  
United States Department of the Interior, National Park Service  
The Nature Conservancy, Hawai'i Office  
National Oceanic and Atmospheric Administration  
Office of Hawaiian Affairs  
Pacific Science Association  
State of Hawai'i, Department of Land and Natural Resources  
Trust for Public Land, Hawaiian Islands Program  
University of Hawai'i  
United States Army Corps of Engineers  
United States Army Garrison Hawai'i  
United States Department of Agriculture, Institute for Pacific Islands Forestry  
United States Department of Agriculture, Natural Resources Conservation Service  
United States Department of the Interior, Fish & Wildlife Service  
United States Department of the Interior, Office of Insular Affairs  
United States Department of the Interior, United States Geological Survey

**2016-2017**

### PICCC Executive Council

Chairperson: **Gordon Tribble**, United States Geological Survey, Pacific Islands Ecosystems Research Center

Vice-Chairperson: **Sharon Ziegler-Chong**, University of Hawai'i, Hilo

Chairperson Emeritus: **Ric Lopez**, United States Forest Service, Institute of Pacific Islands Forestry

Member-At-Large: **Namaka Whitehead**, Kamehameha Schools

Member-At-Large: **Jonathan Ching**, Office of Hawaiian Affairs

Ex-Officio Member: **John Marra**, National Oceanic and Atmospheric Administration, National Environmental Satellite, Data and Information Service, National Centers for Environmental Information

Ex-Officio Member: **Dave Helweg**, Department of Interior, Pacific Islands Climate Science Center

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We gratefully acknowledge the support of the organizations that fund and administer the Cooperative's Team positions: United States Fish and Wildlife Service, Pacific Region, Science Applications Program; National Park Service Climate Change Response Program and Pacific West Region; United States Geological Survey Pacific Island Ecosystems Research Center; Department of the Interior Pacific Islands Climate Science Center; University of Hawai'i at Mānoa, Pacific Biosciences Research Center, Center for Conservation Research and Training; and University of Hawai'i at Hilo, Office of Research.

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For more information about the PICCC, please visit: <http://piccc.net>

For more information about the LCC Network, please visit: <http://lccnetwork.org>

