

# Quarterly Report

## November, 2013

We're still trialing our new system for reporting and we would like your feedback! Please have a chat with Katie Munkres or Deanna Spooner to let us know your thoughts. Our aim is to streamline the reporting process by providing useful templates, prompts and reminders for members while at the same time adding value by improving the substance and presentation of our reports.

As the Quarterly Report is the key mechanism for knowledge sharing amongst steering committee members, we feel this communication tool is key to the success of our cooperative. Over the coming months we will be asking members to commit to ensuring that your organization's report contribution is useful, engaging and informative. Our Communications and Partnerships Manager, Katie Munkres, will be on hand to help. Katie can answer any questions you have and provide tips on how to capture people's interest, keep their attention and present "asks" that can be translated into cooperative action. After all, that's why we get together!

In addition, we ask that all members who wish to provide a verbal update also supply this information in their written member report so that all information presented in the meeting is available in written form.

Mahalo for your feedback.

The PICCC Team

# Member Reports

Member Organization	Report Supplied	Page
American Bird Conservancy		
Bishop Museum		
Hawai'i Wetland Joint Venture		
Kamehameha Schools, Land Assets Division -- Endowment Group	YES ☺	2
National Park Service		
Micronesia Conservation Trust	YES ☺	3
National Park Service, Pacific Western Region		
National Park Service, Pacific Islands Inventory and Monitoring Program	YES ☺	4
The Nature Conservancy Hawai'i Office	YES ☺	5
NOAA National Marine Fisheries Service, Pacific Islands Regional Office		
NOAA NESDIS NCDL Climate Services / East-West Center		
NOAA Pacific Services Center		
Papahānaumokuākea Marine National Monument		
Office of Hawaiian Affairs		
Department of Interior, Office of Insular Affairs		
Pacific Science Association		
State of Hawai'i, Division of Forestry and Wildlife, Department of Land and Natural Resources		
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University of Hawai'i at Mānoa, Social Science Research Institute		
University of Hawai'i at Mānoa, Center for Conservation Research and Training		
U.S. Army Garrison Hawai'i		
U.S. Department of Agriculture Institute for Pacific Islands Forestry, Pacific Southwest Research Station		
U.S. Department of Agriculture Natural Resources Conservation Service		
U.S. Fish and Wildlife Service Ecological Services Pacific Islands Fish and Wildlife Office		
U.S. Fish and Wildlife Service, Division of Migratory Birds and Habitat Programs, Region 1		
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U.S. Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program, Region 1	YES ☺	9
U.S. Geological Survey Pacific Island Ecosystems Research Center and Pacific Coastal and Marine Science Center (non-member)	YES ☺	10
U.S. Geological Survey Pacific Islands Water Science Center	YES ☺	11

# Kamehameha Schools, Land Assets Division – Endowment Group



KAMEHAMEHA SCHOOLS

The Land Assets Division of Kamehameha Schools manages approximately 365,000 acres on five islands including 136,000 acres that are currently managed for ecosystem health. Kamehameha Schools' mission is to fulfill Pauahi's desire to create educational opportunities in perpetuity to improve the capability and well-being of people of Hawaiian ancestry. The vision of Kamehameha Schools Natural and Cultural Resource Management is, I Hawai'i no na Hawai'i i ka 'āina, Hawaiians are Hawaiians because of the land; Hawai'i is the source of ancestral identity and existence.

## We're proud to report

Lupea, a 6,000 acre unit located in Mauka Kona, is anticipated to be completely fenced by the end of FY 2013. This unit contains areas of high-quality, native, high-elevation dryland forest with some of the largest remaining stands of 'iliahi in the state.

Restoration of this unit will be challenging due to the extremely dry climate of the area. This is compounded by the on-going drought being experienced by areas across Hawai'i Island. KS is excited to embark on restoration of this unit and is excited yet apprehensive of the challenge ahead.

For more information or to find out how to work with us on this exciting project, please contact Mililani Browning (808) 430-3262 or email at [rebrowni@ksbe.edu](mailto:rebrowni@ksbe.edu)

## Can you help?

We would like help answering the following questions:

- 1) Can anyone provide direction on forest and coastal wetland management initiatives which could increase resiliency for future climate change impacts?
- 2) Do people have thoughts on how we can quantify and/or communicate the results of adaptation efforts in order to display their efficacy to affected communities?
- 3) What restoration techniques should we employ in areas like Mauka Kona which are becoming progressively more dry and are approaching a state of semi-desertification?

Contact Mili if you can help or would like to partner with KS to answer these critical questions.

## Want to work together?

We would love to work with others who can assist us in identifying and communicating the cultural impacts of climate change. Please contact Mililani Browning (808) 430-3262; [rebrowni@ksbe.edu](mailto:rebrowni@ksbe.edu)

## Why we love PICCC

The recent PICCC-hosted presentations by Dr Morgan Pratchett regarding the effects of climate change on fisheries and the protocols for current fishery management in island nations were very informative and helpful. The dire predictions of fish supplies reinforced the need to restore and reinvigorate our Loko I'a, or fishponds, to help supplement our fish supplies in the future.

# Micronesia Conservation Trust



The Micronesia Conservation Trust (MCT) supports biodiversity conservation and related sustainable development for the people of Micronesia in the Federated States of Micronesia (FSM), the Republic of Palau (ROP), the Republic of the Marshall Islands (RMI), the US Territory of Guam and the Commonwealth of the Northern Mariana Islands (CNMI). MCT supports conservation across Micronesia by providing long-term, sustained funding through grant programs, building the capacity of Micronesians and Micronesian organizations to design and manage conservation programs, and providing a regional forum to bring people from government, private enterprise, and community and non-profit organizations together to collectively address the challenges of natural resource management in Micronesia.

## Did you know?

Our PIMPAC socioeconomic partners just finished a training and assessment in the Walung community in Kosrae. This isolated coastal community, which is only currently accessible by boat, was selected in response to concerns related to climate change and community vulnerability.

During the workshop the Micronesia Challenge socioeconomic indicators were field tested for the first time. The training collaborated with and supported the ongoing European Union Global Climate Change Alliance Project, facilitated through the University of South Pacific, Pacific Center for Sustainable Development, which is focused on non-formal training in community interaction, rapid assessments, V&A assessments, community planning, adaptation planning, climate change adaptation, and disaster risk management for three pilot sites in FSM. Access the report at: [http://pimpac.org/images/KosraeSEMP\\_Final\\_Report\\_Walung\\_Sept%202013.pdf](http://pimpac.org/images/KosraeSEMP_Final_Report_Walung_Sept%202013.pdf)

## Our current projects and programs

Erosion control has been identified as a key climate change adaptation action for many Pacific Island nations. We have received many requests for tools to assist resource managers in understanding, selecting and executing the most appropriate and environmentally sound erosion control measures. Meghan Gombos and Berna Gorong have been in Fiji developing training materials for an erosion control training planned for January.

## Can you help?

MCT and PIMPAC have implemented the Adapting to a Changing Climate workshop in all of its primary partner jurisdictions, except Guam and Hawaii. TNC has secured funding for a workshop in Guam, which is currently planned for the week of 10-14 March 2014. I am interested in collaborating with any organization that would be interested in supporting a training in Hawaii. If you are interested, please contact me at [michael.lameier@noaa.gov](mailto:michael.lameier@noaa.gov) or 944-2274. Reports from previous trainings are available at <http://pimpac.org/activities.php?pg2=2&pg3=8>

# National Park Service, Pacific Islands Inventory and Monitoring



The National Park Service (NPS) is a bureau of the U.S. Department of the Interior. The NPS manages the 401 parks of the National Park System. The NPS also helps administer dozens of affiliated sites, the National Register of Historic Places, National Heritage Areas, National Wild and Scenic Rivers, National Historic Landmarks, and National Trails.

The Pacific Island Network - Inventory and Monitoring Program is a major component of the National Park Service's strategy to improve park management through greater reliance on scientific information. The Pacific Island Network (PACN) is one of 32 National Park Service Inventory & Monitoring networks of national parks linked by geography and shared natural resource characteristics. Spanning islands in American Samoa, Guam, the Northern Mariana archipelago, and Hawaii, the Pacific Island Network encompasses an area as large as the continental United States.

## We're proud to report on our newest outreach materials

The Pacific Island Inventory and Monitoring Program would like to spotlight two new climate change science communication projects based on original artwork by Rochelle Mason. The art is an abstract depiction of a Big Island landscape from mauka to makai including native fish, birds, plants, and other animals in a split perspective. One side has the current richness of life, while the other side shows a future Hawaii affected by climate change.

One product will be a poster that has additional interpretative information and will be used as a participation prize during our interpretative outreach games at festivals and fairs. The other product will be a 2014 calendar that uses the artwork to spotlight a different climate change theme every month (human health, coral reefs, vegetation, etc.). We also actively distribute these products to teachers. We find calendars to be an effective outreach product - they are often looked at every day for a year!

For more information contact Greg Kudray, [gkudray@nps.gov](mailto:gkudray@nps.gov), 808-985-6183.

# The Nature Conservancy



The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends. In Hawai'i, we maintain a network of preserves on five islands, totaling 36,000 acres of native Hawaiian ecosystems. But by working in partnership with other land managing agencies, individuals and organizations, we help protect over 200,000 acres of these amazing Hawaiian landscapes. Working with local communities around the state, we are helping conserve marine resources for future generations.

## Our current projects and programs

In the He'eia ahupua'a, which drains into Kāne'ohe Bay, TNC is working closely with the local community & the community group Kāko'o 'Ōiwi, to restore 200 acres of abandoned lands to functioning taro lo'i. The lo'i will provide numerous benefits to the local community, including: (1) increased food security, (2) a source of sustainable income, and (3) restoration of an important cultural practice. This project is designed to also decrease sediment and nutrient levels in the run-off entering Kāne'ohe Bay. Preliminary research shows promising results. A series of three lo'i at He'eia effectively reduced suspended material in the water (as measured by water clarity or turbidity) by as much as 50% following a large rain event.

## Did you know?

PICCC members missed out on a presentation of one of our biologists, Dr. Dwayne Minton on November 7. Hosted by TNC and Mālama Maunalua, he reported on the results of monitoring following the huge alien algae removal project (The Great Huki) at Maunalua Bay, an example of an attempt to increase resilience and diversity of a nearshore system by counteracting a major threat. TNC occasionally sets up these kinds of presentations and cordially invites our PICCC partners to attend. contact Evelyn Wight, [ewight@tnc.org](mailto:ewight@tnc.org)

## Can you help?

We realize that the new PICCC Vulnerability Assessment for native flowering plants and forest birds includes some major implications on management for key rare elements of biodiversity. We want to see an assessment of the vulnerabilities displayed geospatially against protection and management efforts. How will that geography need to shift in the coming decades for all islands?

## Can you join us?

We continue to advocate for more research on water dynamics of native versus alien forests (along the lines of Tom Giambelluca) toward a cost/benefit assessment of native watershed protection. On the other side of the coin, we desire clear demonstrations of the impacts of alien species on watershed function.

## Why we love PICCC

TNC's association with PICCC has led to a new project in Sāmoa, assisting with CC planning there. The newly-developed Plant VA of PICCC promises to identify our regions and species most at risk of CC-related habitat loss, and inform our future strategies in acquisition and management. For more info, contact Sam 'Ohu Gon III, 5876241 [sgon@tnc.org](mailto:sgon@tnc.org)

# Trust for Public Land

The Trust for Public Land conserves land for people, ensuing livable communities for generations to come. Our work in Hawai'i has focused on the protection of coastal/shoreline lands, heritage lands that perpetuate Hawaiian culture, and working lands that contribute to Hawai'i's self-sufficiency.



## Our current projects and programs

Across Hawai'i, tens of thousands of acres are for sale. This includes productive agricultural acreage and rare wilderness land, for which development proposals can prompt public controversy and costly litigation. These landscapes hold *mo'olelo* (stories) that tie us to Hawai'i's ancestral past, even as they connect us to today's flourishing native culture. Agricultural lands support diverse crops and food security. And wilderness lands are beautiful places to roam and explore.

The best way to preserve these lands is to balance development with conservation based on a scientifically sound planning process that takes the land's special values into account. The Trust for Public Land and the Office of Hawaiian Affairs are now working on such a plan, known as a Greenprint. After launching on O'ahu, the Greenprint will expand to cover the entire state.

## How it will work

To create the Greenprint, our planning team will:

- engage residents during interviews, in polling, and at stakeholder meetings and "SpeakOuts" (booths at community events)
- establish the value residents place on cultural, recreational, and natural resources, including *heiau* (places of worship), fishponds, farms, ranches, parks, conserved lands, drinking water protection, and the restoration of *lo'i kalo* (wetland taro patches)
- integrate this value-based data with science-based land data from sources such as The Nature Conservancy and the Pacific Islands Climate Change Cooperative
- create GIS maps and models that display the best opportunities for land conservation based on prioritized human values and scientific data

## Can you help?

The Trust for Public Land and the Office of Hawaiian Affairs are co-convening the O'ahu Greenprint (PICCC GIS guru Patrick Grady is a member of the technical advisory team). The Greenprint is a tool for voluntary conservation of privately owned land, and identifies what the community's priorities are for land conservation. We hope to include relevant climate layers such as Chip Fletcher's sea level rise data. If you have GIS data you think would be relevant to this effort, please contact Lea Hong at [lea.hong@tpl.org](mailto:lea.hong@tpl.org) 524-8563. More info about the Oahu Greenprint is attached.

## Can you join us?

Our next Island Leadership Team meeting for the O'ahu Greenprint is October 30, from 6-8 at Mo'ilili Community Center. If you would like to attend or come to future meetings, please email Lea Hong at [lea.hong@tpl.org](mailto:lea.hong@tpl.org).

# University of Hawai'i at Hilo, Office of Research



The University of Hawai'i at Hilo is a public university with a portfolio of distinguished undergraduate programs and select graduate and professional degrees that seek to improve the quality of life of the people of Hawai'i Island and state. We are committed to excellence in higher education and learning with aloha. We inspire our students to explore, investigate and discover, through the cultivation of innovation, creativity, and critical thinking. Our faculty and students undertake research activities that enhance both our students' learning and our university's contribution to society.

## Our current projects and programs

We currently have four ongoing projects that are funded through UHH's direct Pacific Islands Climate Science Center support. They are as follows, with lead principle investigators identified:

1. Stand level water-use in forests of contrasting rainfall regimes: assessing the impacts of future drying on native Hawaiian ecosystems, R. Ostertag – UHH Biology, with co-PIs from USDA Forest Service and UH Mānoa Geography and Natural Resources and Environmental Management
2. Real-time observations of benthic ocean chemistry on two coral reefs in West Hawai'i, Steven Colbert and Jim Beets – UHH Marine Science
3. Reconstructing pre-historic climate variability in Hawaii and the tropical Pacific using tree rings, Pat Hart – UHH Biology, with co-PIs from USGS PIERC, Lamont-Doherty Earth Observatory and UH Mānoa School of Ocean and Earth Science and Technology
4. Epiphytes as a bioindicator, Jon Price – UHH Geography and graduate student, Scarlett Kettwich, 2013 George Melendez Wright Climate Change Initiative Fellow

Please contact the principal investigators directly or Sharon Ziegler-Chong: [ziegler@hawaii.edu](mailto:ziegler@hawaii.edu), 808-933-0759.



# Hawaiian and Pacific Islands National Wildlife Refuges, National Wildlife Refuge System



Hawaiian and Pacific Island National Wildlife Refuges include 22 refuges. Ten were set aside primarily to benefit Hawai'i and Guam's endangered waterbirds, rare and unique forest bird species, and threatened and endangered plants. The other 12 Refuges include a widespread collection of coral reef, deep ocean, and atolls and islands important seabirds and shorebirds across the Pacific. Refuges also manages the Rose Atoll, Marianas Trench, and Pacific Remote Islands Marine National Monument, and co-manages the Papahānaumokuākea Marine National Monument.

## Did you know?

On Oahu Forest and Hakalau Forest National Wildlife Refuges work is commencing on a Cooperative Recovery Initiative benefiting 27 plant species facing imminent extinction. The rarity of these plants has led to their placement on the Hawaii "Plant Extinction Prevention" (PEP) list, species having fewer than 50 individual plants remaining in the wild. The project is designed to protect the species' habitat and provide secure areas to outplant individuals where they exist presently or historically. The project consists of building/maintaining exclusion fences to protect remaining plants from feral pigs, ungulate removal from fenced areas, construction of greenhouses, propagation of 22 species in greenhouses, and the post-propagation outplanting of 25-100 individuals of each species into the fenced areas.

For More Information Contact:

Steve Kendall, Hakalau Forest  
808-443-2300 ext. 228  
Steve\_Kendall@fws.gov

Dave Ellis, Oahu Forest  
808-637-6330 ext. 26  
Dave\_Ellis@fws.gov

# U.S. Geological Survey Pacific Islands Ecosystems Research Center



The U.S. Geological Survey Pacific Islands Ecosystems Research Center provides scientific leadership in support of national, regional, and local needs to understand, conserve, and manage natural resources in Pacific island ecosystems. Our mission is to ensure the long-term health and sustainability of Pacific island ecosystems by providing reliable, effective and relevant science.

## Our current projects and programs

The U.S. Geological Survey Pacific Islands Ecosystems Research Center is currently working on some exciting research projects.

1. Along with our PICCC partners, we are looking forward to the imminent publication of a vulnerability assessment for Hawaiian plants under a changing climate (Lucas Fortini).
2. Along the same lines, we are working to publish research forecasting the distribution of habitat for Hawaiian plants (Jim Jacobi)
3. We are continuing low-level research on the effect of climate change on Kauai forest birds (Carter Atkinson)

For more information on these projects, please contact Gordon Tribble.

# U.S. Geological Survey Pacific Coastal and Marine Science Center



The U.S. Geological Survey Pacific Coastal and Marine Science Center conducts multidisciplinary scientific research in the coastal and offshore areas of California, Oregon, Washington, Alaska, Hawaii, and other US Pacific Islands; and in other waterways of the United States.

The overall goal of the USGS Coastal and Marine Geology Program is to provide the scientific information, knowledge, and tools required to ensure that decisions about land and resource use, management practices, and future development in the coastal zone and adjacent watersheds can be evaluated with a complete understanding of the probable effects on coastal ecosystems and communities, and a full assessment of their vulnerability to natural and human-driven changes.

## Our current projects and programs

1. As part of the FY2010-2014 Pacific Coral Reef Project, the USGS-PCMSC continues to develop records of climate change, as derived from geochemical records, over the last several decades to centuries from coral cores in Hawaii, Guam, and American Samoa.
2. The USGS-PCMSC, funded by PICCC/PICSC, is using global climate model and coupled numerical wave model output to provide hourly data and statistical measures of wave height, wave period, wave direction, wind speed, and wind direction for DOI-managed coastal parks and refuges, DOD facilities, and other US-affiliated Pacific Islands in the central and western Pacific Ocean for the recent past and future projections for two different future global emission scenarios.
3. The USGS-PCMSC is leading a joint effort with USGS-PIWSC, USGS-NRP, NOAA, and University of Hawaii that is funded by DOD to provide basic understanding and specific information on storm ocean surface wave-induced inundation of atoll islets that house DOD installations and assess the resulting impact of sea-level rise and storm-wave inundation on infrastructure and freshwater availability under a variety of sea-level rise and climatic scenarios, based on historic information, sea-level rise predictions, and GCM wind, wave, and precipitation output.

Contact: Curt Storlazzi, US Geological Survey, +1-831-460-7521, [cstorlazzi@usgs.gov](mailto:cstorlazzi@usgs.gov)

## Why we love PICCC

Membership in the PICCC has increased communication which has led, in turn, to better coordination amongst researchers working on climate change issues in the Pacific region. The PICCC cooperative has resulted in the development of new research efforts that have been funded.

# U.S. Geological Survey Pacific Islands Water Science Center



The Pacific Islands Water Science Center (WSC) is one of 48 Water Science Centers U.S. Geological Survey. The Water Science Center's mission is to provide reliable, impartial, timely information needed to understand the quantity and quality of water resources in Hawai'i and the U.S. affiliated islands in the Pacific. For more information visit <http://hi.water.usgs.gov/about/>

## Our current projects and programs

USGS Pacific Islands Water Science Center Pacific RISA continues to analyze hydrologic trends in concurrent streamflow and rainfall data from American Samoa, Guam, Federated States of Micronesia, and Hawaii. Monitoring of streamflow and rainfall at long-term trend stations continued with support from the State of Hawaii Commission on Water Resource Management and County of Maui Department of Water Supply.

## We're proud to report

Delwyn Oki of the USGS Pacific Islands Water Science Center gave a presentation on "approaches for assessing the benefits on watershed restoration on water availability" at the Hawaii Water Works Association Conference on October 24, 2013. Here is link to the presentation - [http://hi.water.usgs.gov/HWWA\\_oki\\_20131024.pdf](http://hi.water.usgs.gov/HWWA_oki_20131024.pdf)

## Can you help?

There are several statistical and dynamical downscaling efforts underway for the State of Hawaii. Members will need assistance in evaluating which to use in their planning and management efforts.

For more information please contact Stephen Anthony, [santhony@usgs.gov](mailto:santhony@usgs.gov)

# Core Team Report

## Big news for the Pacific region

### Hawai'i signs Majuro Declaration

The State of Hawai'i signed on to the Majuro Declaration (discussed in the last quarterly report) becoming the first sub-national government to do so.

## On the burner *(cool stuff we're working on now)*

### PICCC strategizes ways to become more effective (Strategic Planning Update)

In case you missed it, our last PICCC Quarterly Steering Committee Retreat was a day-long strategic planning extravaganza. A big mahalo to all those who participated in person or otherwise!

Although our progress was stalled by the government shutdown, work on PICCC's Strategic Plan resumed on Oct. 17. Since then, we've been busy reviewing and consolidating your feedback and the finding of the Sept 25<sup>th</sup> retreat. From all this rich material, we've development of a draft Strategic Direction statement (which you will already know about if you did your homework).

A draft of the Strategic Direction and Goal Statements were distributed to the Steering Committee on Nov. 5 for review and decision making. Pending approval, the PICCC team will re-engage the Planning Working Group to further develop the logic models and operational steps needed to have the Strategic Plan ready for approval by December 31.

### Helping our island Landscape Conservation Cooperative (LCC) partners

The PICCC was invited by the Caribbean LCC (CLCC) to attend their upcoming Steering Committee meeting and workshop to further development of a Strategic Conservation Framework. Given PICCC current strategic planning efforts and similar conservation and adaptation issues, the CLCC felt it would be beneficial for PICCC to share its perspectives and lessons learned. Stanton Enomoto will be heading to San Juan, Puerto Rico to attend these meetings from December 9-13.

### Greenprinting Oahu – PICCC lends a hand to Trust for Public Lands

The PICCC was invited to participate in the Trust for Public Lands (TPL) recently launched Oahu Greenprint project. Similar to other TPL projects on the mainland, the Oahu Greenprint is a strategic plan with a GIS visualization that identifies community priorities for conservation. PICCC staff members Stanton Enomoto and Patrick Grady are participating on the Steering Committee and Technical Advisory Committee. Completion of the Oahu Greenprint is scheduled for summer 2014.

**Want to help?** The Technical Advisory Team is a group of experts that assists in identifying the best GIS data available to use for the Greenprint. If you aren't part of the Greenprint committee

already, any ideas or suggestions from PICCC members can be passed on through Patrick Grady so please see Patrick if you or your mapping teams would like to get involved.

## Data on tap

We're pleased to report that all of the PICCC funded projects for 2012 have submitted data management plans. This will be important in helping us help you to access important data sets now and in the future. Patrick and Jeff have also been compiling a list of all the PICCC funded projects and the relevant data products they will result in. We will share this list far and wide as soon as it completed.

## Science Stuff

### PICCC's report on Hawaiian plant vulnerability about to hit the press

You've been hearing about it for months. It's had a long gestation period and is fondly referred to in the office as Lucas's second child. It's big, it's bad and it's about to hit a library near you! Within a matter of days our long-awaited vulnerability assessment for Hawaiian plants will be released. We're telling you about it first, but everyone is going to want to know what climate change will mean for our local greens! So, please be ready to help spread the news far and wide when we give the signal. If you are prepared to help field media calls regarding what the report's findings could mean for Hawaii and for natural resource managers, we could use some volunteers. Please let Katie or Lucas know you are willing and able to assist.

### The report's findings

No surprises that like other climate change projections the news is ...well, bad. Hawaii is set to maintain the dubious honor of leading the world in the rate of extinctions. By 2100 at least 55 native Hawaiian plants are expected to lose all suitable habitat. Most surprising finding? This list includes 17 species currently thought to be secure.

The report has detailed projections for over 1,000 species of plants. To get the skinny on your favorite stems, you'll need to explore the 100+ page report for yourself.

### What's the big deal?

This vulnerability assessment is possibly the largest in scope ever conducted in the United States, with over 1000 species considered, 319 of which are listed as either endangered or threatened under the U.S. Endangered Species Act of 1979. The report fills a critical knowledge gap for resource managers in the region. Assessment information can be used in several conservation-related prioritization decisions including what to conserve (e.g. which species to focus on), where to conserve (e.g. prioritizing new protected areas), how to conserve (i.e. prioritize management actions and conservation strategies), along with research and monitoring prioritization decisions. This vulnerability assessment provides important information that can guide adaptive stem ecosystem management planning and implementation. The report shows that despite the fact that there are multiple recognized threats to island ecosystems that may have greater urgency than climate change, there are many occasions where acting on climate change information is both feasible and warranted.

### Where to get it

The report will be published electronically as a Hawai'i Cooperative Studies Unit Technical Report with the reference:

Fortini, L. B., J. P. Price, J. D. Jacobi, A. E. Vorsino, J. M. Burgett, K. W. Brinck, F. A. Amidon, S. E. Miller, S. M. Gon, G. F. Koob, E. H. Paxton. 2013. *A landscape-based assessment of climate change vulnerability for all native Hawaiian plants*. Hawai'i Cooperative Studies Unit Technical Report. Hilo, HI, USA: University of Hawai'i at Hilo.

### **Bad news for birds**

A model-intensive effort by a multi-agency team led by Lucas Fortini is showing very clear links between current climate and forest bird distributions. Using the latest projections from climate models still under development, this project is indicating that species ranges will move uphill, shrink, and even disappear as the climate warms Fortini says.

"We are considering all of the most up to date climate information for the archipelago. We're utilizing data from the recently released rainfall atlas dataset and the three and one km resolution dynamic downscaled climate projections by Kevin Hamilton's group to make sure we have the best projections possible."

This massive modeling effort is earmarked for completion by the end of the year. Once the modeling is finished, the report will follow.

### **Initial review complete for 2014 request for funding proposals**

Twenty-eight Statements of Interest (SOIs) have been reviewed for the FY2014 research PICCC science funding. Full proposals will be solicited next week following decision-making by the Science Working Group. The Request for Proposals (RFP) specifically asked for projects focused on the impacts of sea level rise and changing precipitation and emphasized the importance of direct connections between researchers and resource managers. The RFP also gave priority to projects that incorporate non-traditional knowledge systems or approaches (e.g. use of traditional ecological knowledge). See Jeff Burgett if you have questions on this process.

### **On the seventh day of Christmas, PICCC gave to me.... seven project reports!**

Seven PICCC projects will submit final reports in December. These include:

- Kevin Hamilton's dynamical climate downscaling for Hawai'i
- Chip Fletcher's study of sea level rise impacts to wetlands
- Paul Jokiel's study of coral responses to temperature, pH, and depth
- Brian von Herzen's study of reef cooling to combat bleaching events
- Dylan Kesler's study of Micronesian bird's responses to vegetation change
- Brian Schubert's study on use of Mamane tree rings to estimate past rainfall
- Jeff Maynard's work on global projections of coral bleaching and acidification

Merry Christmas from the PICCC!

## Impact of pH on coral reefs quantified

According to recent PICCC-funded research, sea water is heating up to the point where coral reefs around the world will bleach annually within the next 50-70 years. But what about ocean pH? A second publication from Jeff Maynard and his team reveals that changing ocean chemistry will speed up decimation of the world's coral reefs. A pre-publication version of this research is now available online in Global Change Biology (2013), doi: 10.1111/gcb.12394 or <http://onlinelibrary.wiley.com/doi/10.1111/gcb.12394/full>

Please see Jeff Burgett for more details.

## Reef demise projected and mapped on Google Earth

Want to know when rising sea temperature and changing ocean chemistry will combine to wreak havoc on a reef near you? Now you can find out thanks to a new PICCC-funded Google Earth-based planning tool that depicts the future decade in which a given coral reef location will exceed critical levels of stress (due to ocean acidification and high sea temperatures). Using this tool, managers, planners and others can examine different climate change scenarios and assess the timeframes required for management actions to increase reef resilience and prepare communities for inevitable changes in coral reef ecosystems. We are hoping to attract the interest of people around the world with this unique tool. A link to the Google Earth maps can be found in the latest publication by Maynard and crew.

## Let's have a chat!

We love hearing from you so please give us a call, send us an email or drop by our office for a chat whenever the opportunity arises! Here are some contact details for the PICCC core team (and don't forget to connect with other PICCC members too):

**Jeff Burgett**  
Science Coordinator  
[jeff.burgett@piccc.net](mailto:jeff.burgett@piccc.net)  
808 687 6175 ext 1002

**Lucas Fortini**  
Research Ecologist  
[lucas.fortini@piccc.net](mailto:lucas.fortini@piccc.net)  
808 687 6175 ext 1011

**Patrick Grady**  
GIS and Data Manager  
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