A Joint Climate Change Newsletter from the PICCC and the PICSC

October 2015

PACIFIC PANDANUS

NAVIGATING WITH THE BEST CLIMATE SCIENCE

Aloha, Hafa adai, Yokwe, Talofa, Alii, Mogethin, Ran allim, Kaselehlia, Hello!

As anyone living in the Pacific islands can tell you, this region hosts a range of terrestrial, marine, and freshwater ecosystems that support unique and valuable biological and cultural resources. Climate change and variability persistently threaten these fragile resources, which are integral to the well-being of our rich and diverse human communities.

In order to confront and adapt to this climate challenge, a collaboration of research, resource management, and policy decisions may come into play. The Pacific Islands Climate Science Center (PICSC) and the Pacific Islands Climate Change Cooperative (PICCC) are attempting to do just that—support and assist managers, policymakers, and communities to become more resilient and adaptable to future changes. We created this joint newsletter to share highlights from our science, research, and management-driven adaptation activities and to provide an update of the actions that our partners are taking to confront vulnerability to climate change in the region.

Each quarterly installment of the Pacific Islands Climate Newsletter will have a theme—the theme for this first issue is actionable science. Learn more about actionable science on page 2!

In this issue...

PACIFIC ISLANDS CLIMATE SCIENCE CENTER PICSC

PACIFIC ISLANDS CLIMATE CHANGE COOPERATIVE

About Us

Pacific Islands Climate Science Center

The PICSC provides expertise in developing and applying climate change science to societal and ecological challenges across the region. The mission of the PICSC is to deliver to resource managers in federal, state, and local agencies access to the best science available on climate change and other landscape-scale stressors that are impacting the region's natural and cultural resources.

Pacific Islands Climate Change Cooperative

The PICCC aims to assist those who manage native species, island ecosystems, and key cultural resources in adapting their management to climate change. The PICCC does this by connecting science, traditional knowledge and practices, and management actions to achieve adaptation.

Actionable Science

How can we be sure our science is used? Actionable science aims to be relevant and usable and inform government, community, and non-governmental organization audiences. In turn those groups can craft decisions, policies, strategies, planning, and behaviors based on the most up-to-date climate research. By working with stakeholders including resource managers and decision-makers, scientists have an opportunity to co-develop data and tools that can support informed management decisions and minimize risks and impacts associated with climate change to our Pacific island communities.

The king tide flooding in Majuro is just one major hazard that is exacerbated with sea level rise impacts associated with climate change. Photo: US Embassy Majuro

Silverswords in the House of the Sun

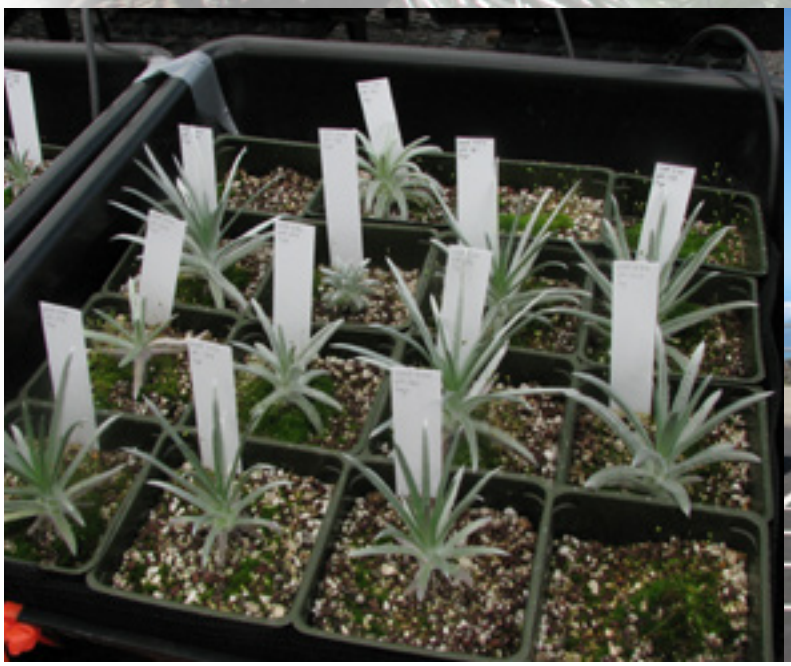
Cinder, cinder, and more cinder. Not much else to be seen up at the peak of Haleakalā Volcano in Haleakalā National Park on the Hawaiian island of Maui. Haleakalā means house of the sun, and when you stand up here at what certainly feels like the top of the world, it is a fitting name to this barren, silent place above the cloud bank. Here, in stark contrast to the dark, dry sands, you can find the Haleakalā silversword (or ʻāhinahina), an endemic and threatened Hawaiian plant, whose name belies its very shape—that of narrow silvery leaves that cut through the thin air like living swords.

The Haleakalā silversword and the closely related species that make up the silversword alliance, make their homes only within the main Hawaiian Islands. These are tropical islands, of course, but at the altitude where the Haleakalā silverswords grow, it is not your typical lush jungle, but more of a desert, with little rainfall and extreme sun and wind exposure. Or, at least, that's what it has been like at the top of Haleakalā. Researcher Paul Krushelnycky has been studying what might happen to this rocky landscape if the future holds a hotter and drier climate at this altitude. How will the silverswords be affected by these changes? Will they still survive?

To answer this, Paul and his fellow researchers worked closely with the National Park Service to collect population and weather data. They use that data to model future silversword population changes in response to the environment. They also conducted drought and temperature tolerance experiments to address these issues and develop protocols for silversword planting and the planting of other species for restoration.

Park managers and interpreters can use the products that the project produced, including: climate data from the six Haleakalā stations; silversword breeding and outplanting recommendations; a population model for understanding the future responses of Haleakalā silversword to changing conditions; several peer-reviewed publications; and regular updates of relevant findings to Haleakalā National Park interpretive staff, for use in presentations to park visitors. This is an example of actionable science at work!

This research was funded in part by the PICCC and the PICSC. Funding also came from Haleakalā National Park and Hauʻoli Mau Loa Foundation.



Above: Young silverswords to be used for outplantings. Photo: J. Felts
Inset: Adult silversword. Photo: P. Krushelnycky
Background: Flowering silversword. Photo: P. Krushelnycky

Above: A mobile nursery houses young silverswords for planting and serves as an educational tool to explain climate changes that might impact the species to park visitors. Photo: J. Felts

Visualizing a Climate Change Future

How are winds and waves expected to shift across the Pacific islands due to climate change? Which areas in Saipan are the most vulnerable to climate hazards? Data like this can be useful and effective, but only if people are able to access the information and use it to visualize the future and collaborate on solutions.

The PICCC's Conservation Planning Atlas (CPA; piccc.databasin.org), powered by the Conservation Biology Institute's Data Basin, is intended to help with just that: the site provides users with free access to climate change data relevant to the Pacific islands.

To better integrate science with management actions, climate data need to be accessible. The CPA makes climate change data available to everyone, and it is especially useful for resource managers, planners, scientists and researchers, educators, and students. The data shared by scientists and institutions on the CPA are user-friendly and appeal to varying levels of technical expertise. You don't have to be a GIS expert to use and explore the data!

Featured maps of the CPA include the Saipan Social Vulnerability Index (pictured in the background), critical habitat and watersheds within the state of Hawai'i, and forest bird species range projections in the main Hawaiian Islands (pictured below).

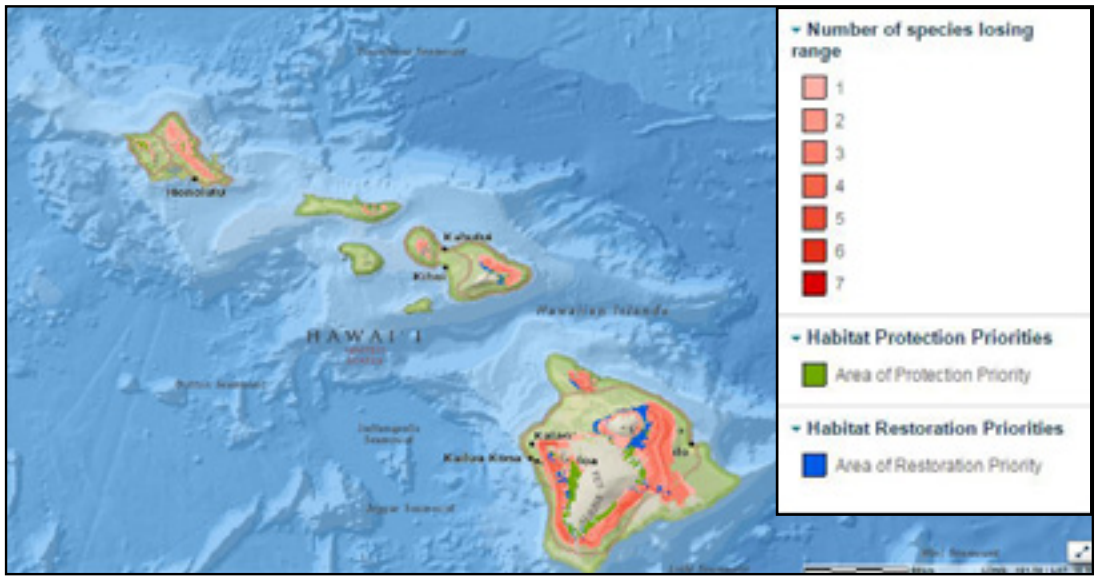
Resource managers and decision-makers can use maps like these to inform decisions and priorities for protection, restoration, and even where to apply limited funding.

"The CPA is intended to be a convenient and user friendly, science-based mapping platform that provides for easy viewing, creating, and sharing of data sets from around the Pacific islands region. The use of the CPA can save users' time and resources by enabling them to access and collaborate on information for free," says Patrick Grady, the PICCC's Data and GIS Manager.

Beyond the access to the Pacific islands datasets, the PICCC's CPA also links to the broader Data Basin website, which provides access to thousands of biological, physical, and socio-economic datasets.

So use the CPA to access climate change data, upload your own content, and visualize data in ways that were never before possible. "The more that people across the Pacific have access to this information," says Grady, "the greater the ability for the data to inform conservation efforts throughout the Pacific islands."

Have you explored the PICCC CPA? Visit piccc.databasin.org to check it out.



The Forest Birds Challenges and Opportunities map illustrates the range predictions for 20 species of forest birds included in the vulnerability assessment funded by the PICCC, as well as habitat restoration and protection. Map: piccc.databasin.org

Background map: Saipan Social Vulnerability Index, illustrating relative levels of vulnerability to climate impacts among Saipan's villages. Map: piccc.databasin.org

Climate Waves

Hawaiʻi downscaling workshop brings climate modeling, ecological impact, and resource management together for exchange

On September 16-17, 2015, the PICSC sponsored a workshop convened with the Pacific Regional Integrated Sciences and Assessments and PICCC at the East-West Center in Honolulu, Hawaiʻi. The "Workshop on Climate Downscaling and its Application in High Hawaiian Islands" brought together top climatologists from the Pacific to discuss and compare different climate modeling methods and results, best practices for applications, and agreement on ways forward to increase applicability through co-development of climate modeling products.

Commentary by Dr. Jeremy Littell, Alaska Climate Science Center, with Dr. Martyn Clark of the National Center for Atmospheric Research and Mr. Barry Usagawa from the Honolulu Board of Water Supply listening. Photo: S. Hasegawa, East-West Center External Affairs

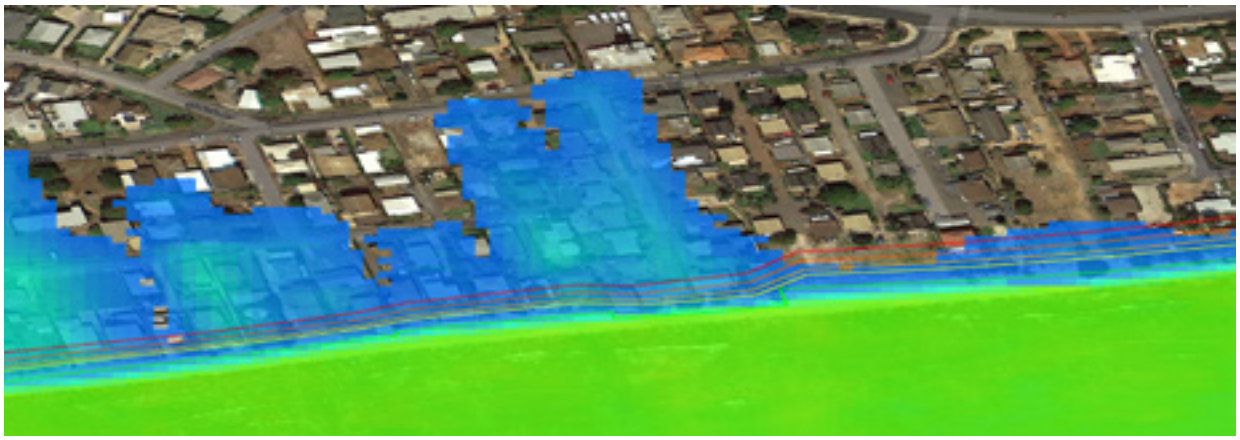
An ʻiʻiwi--a forest bird native to the Hawaiian islands. Photo: R. Kohley

Climate science and the future of Hawaiʻi Forest Bird recovery

On September 24-25, 2015, scientists, resource managers, and conservationists convened at the Hawaiʻi Forest Bird Conservation Forum in Honolulu, Hawaiʻi. Vulnerability assessments, habitat predictions, and avian disease models developed with support from PICSC and PICCC formed a foundation for discussion of the magnitude of challenges to recovery, along with priorities and means to conserve populations of native forest birds across the islands.

Hawaiʻi's Interagency Climate Adaptation Committee contemplates implications of sea level rise

On September 22, 2015, the Hawaiʻi ICAC was briefed with sea level rise predictions developed by Dr. Charles Fletcher (School of Ocean and Earth Sciences, University of Hawaiʻi at Mānoa) and his team, who conducted the research with support from state agencies, PICCC, and the PICSC.



Example of sea level rise predictions for differing points in the future for a length of coast in the main Hawaiian Islands. Photo: C. Fletcher.

More Climate Waves

Resilient Lands and Waters Initiative

The Resilient Lands and Waters Initiative is an initiative from President Obama to recognize key areas across the United States where successful partnerships are working to improve the resilience of landscapes and seascapes in the face of climate change. The President designated three locations in Hawai'i to be part of this initiative: He'eia, West Maui, and West Hawai'i. The PICCC, PICSC, NOAA, EPA, TNC, and other local partners are collaborating in this endeavor to support forward-looking conservation strategies to address stressors including changes in rainfall, drought, and sea-level rise.

At the end of October an expert team from the USGS EROS Data Center and Geography Mission Area will collect coastal and ocean topographical data at the He'eia site to share with partner efforts assessing best practices for management at the watershed. This collaborative mapping effort at He'eia is sponsored by the PICSC.



Photos: D. Spooner, US Fish and Wildlife Service

Pacific People's Lunar Conference on Climate Change

The Lunar Conference, which took place on 25-27 September 2015 in Honolulu, Hawai'i, joined peoples of the Pacific who are looking to renew and reestablish the use of the moon calendar to understand the cycles of people and places. This understanding can be applied to observe the present state of one's self and surroundings, and therefore, observe changes in both. Here are some thoughts from those who took part in the conference...

"Living by the moon was developed as one tool for survival. This technique necessitates the development of an understanding of the relationship and effect the moon has on a particular 'aina (geographical area)." -E. Perry

"People are used to having the media and meteorologists tell them what the weather is and is going to be instead of observing and feeling it themselves. ...As we begin to reconnect more to our environment, one example being the following of a moon calendar, we become monitors to changes in our environment and begin to recognize clues and patterns." -N. Puniwai

"The mahina (moon) not only dictates farming and fishing, but can be implemented into every aspect of life." -C. Kauahi

More on the conference can be found in this University of Hawaii news article or at the Aimalama website.

Bringing glaciers back to the Pacific...

How can learning about glaciers inform science translation work here in the islands? Read more about Heather Kimball's eye-opening experience at the Northwest Climate Science Center's Climate Boot Camp and how it will focus her career, in a less glacial path, on the PICSC university website.

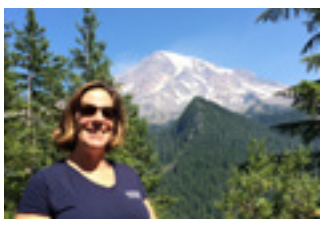
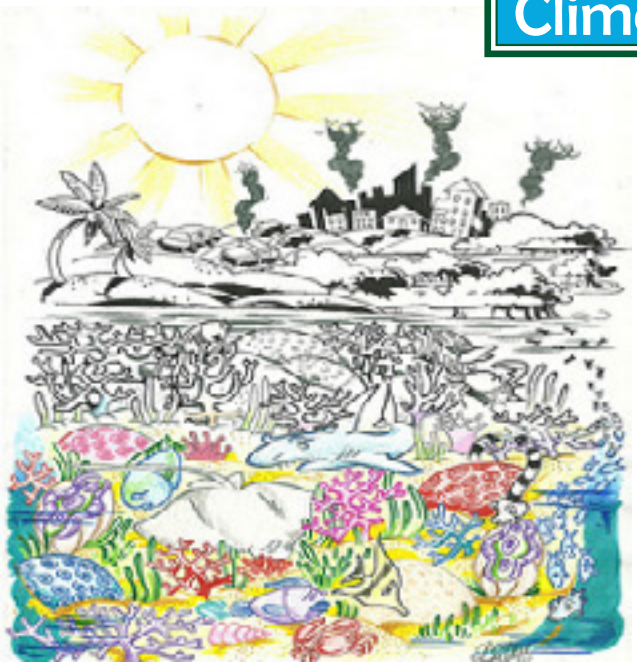


Photo: S. Laursen

Climate in Action



Elsai Tellai of Palau depicts how she sees climate impacts on the environment. Photo: United Nations Development Programme Flickr

Urgent action on climate change policy needed in Palau and across the world

Palau recently revealed the Climate Change Policy for Climate and Disaster Resilient Low Emissions Development. Proactive action in Palau is seen as essential, because climate change is a very real threat to livelihoods and communities of the Pacific people.

Along with revealing the Palau Climate Change Policy, the President of Palau, His Excellency Tommy Remengesau Jr., has called for urgent global action on climate change. President Remengesau recently addressed the UN General Assembly and noted that although there is still time to tackle climate change, countries throughout the world must join together to build a more sustainable future.

American Samoa is doing its part to #standupforthepacific

The goal of the #standupforthepacific and #ourstruggleisreal social media campaigns is to make a strong presence online before the United Nations Climate Change Conference takes place in Paris in November 2015. Kim McGuire of American Samoa's Coral Reef Advisory Group says, "The people of the Pacific are aiming to show world leaders that we care about the consequences of climate change. Wearing red and posting the messages #standupforthepacific and #ourstruggleisreal is a way that we can collectively make a strong statement. If more people join the movement internationally our message can become even more powerful."

For more information visit the #standupforthepacific facebook page or the #ourstruggleisreal facebook page.

Clockwise from left: the staff of Department of Marine and Wildlife Resources, dance champion Pili of Fagatogo, and a class from Matafao Elementary, all hold #standupforthepacific signs. Photos: Coral Reef Advisory Group

Calendar

Recent events...

September

3	M. Bassiouni, USGS Water Sciences Center: Low-flow streams in HI—Webinar
15	Exploring Theory & Application of Climate Downscaling—Webinars
16-17	Climate Downscaling Workshop
21	PICSC Virtual Stakeholder Advisory Council Meeting
24-25	2015 Forest Bird Symposium
25-27	Pacific People's Lunar Conference on Climate Change

Coming up...

October

19-23	LCC Virtual All-Hands Meeting
19-23	Wildlife Society Meeting, Winnipeg, Manitoba

November

10-13	International Congress on Coastal and Marine Tourism, Kailua-Kona, HI

December

3	PICCC Steering Committee Meeting
15-19	American Geophysical Union Fall Meeting, San Francisco, CA

Opportunities

- The **Pacific Exchange Emerging Professionals (PEEP) Program** seeks to provide professional development opportunities for the next generation of conservation leaders. PEEP participants will become part of a larger network of conservation professionals who share resource stewardship concerns across a large, complex biocultural area between Hawai'i, and the Micronesian, Melanesian, or Polynesian archipelagos. Applications are due **October 30**. Visit the HCA website to read more.

- Nominations are open until **November 1** for the AAAS (American Association for the Advancement of Science) **Leshner Leadership Institute for Public Engagement with Science**, focused on climate change in its first year. This program convenes mid-career scientists for a one-week training who demonstrate leadership in their research careers and in promoting meaningful dialogue between science and society. Visit the AAAS website to read more.

- The **Organization for Tropical Studies** (OTS) is seeking Research Mentors (ABD or PhD only) for the Native American and Pacific Islanders Research Experience (NAPIRE) Program at the Las Cruces Biological Station in Costa Rica from June 20 to August 3, 2016. This is a highly rewarding research internship program for minority undergraduates enrolled in accredited colleges in the US and Pacific Island Territories. Apply by **November 30**. Visit the OTS website vacancies page for application information.

- The **Early Climate Career Forum**, hosted by the Northeast Climate Science Center, houses articles, online discussion forums, and job opportunities for students and professionals in climate-related careers. Visit the ECCF website to read more.

Staff In Focus

Maria Kottermair

Maria is a GIS Professional with the PICSC through the University of Guam. Her background is in environmental science and she has lived on Guam for over a decade, with frequent travels to other Pacific islands, especially to remote atoll islands of Micronesia. In recent years, her work expanded to these areas, combining her love and fascination for the people and culture of Micronesia and for GIS.

Olivia Schubert

Olivia joined the PICCC in March of this year, and works part-time as Administrative Assistant and part-time Research Assistant. Olivia graduated from the University of Hawai'i at Mānoa in 2012, where she earned a Master's Degree in Geography focusing on Global Environmental Change. She loves being outdoors, especially with her two dogs.

Who We Are

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PICSC University website ***PICSC Federal website***

PICSC Partners & Stakeholders
Carnegie Institution for Science • Pacific Regional Integrated Science and Assessment program • Stanford University • University of California–Santa Barbara • U.S. Department of Agriculture, Forest Service • Yale University • U.S. Geological Survey, Pacific Region Office • State of Hawai'i, Department of Land and Natural Resources, Division of Aquatic Resources • State of Hawai'i, Department of Land and Natural Resources, Division of Forestry and Wildlife • State of Hawai'i, Office of Hawaiian Affairs • State of Hawai'i, Office of Planning • National Oceanic and Atmospheric Administration (NOAA), NESDIS Climate Services Pacific • NOAA, Office of National Marine Sanctuaries • NOAA, Pacific Islands Region Office • NOAA, Pacific Services Center • U.S. Army Corps of Engineers • U.S. Department of Agriculture, Agricultural Research Services • U.S. Department of Agriculture, Natural Resources Conservation Service • U.S. Department of Defense • U.S. Department of Interior, National Park Service, West Region • U.S. Department of Interior, Office of Insular Affairs • U.S. Department of Interior, Office of Native Hawaiian Relations • U.S. Fish and Wildlife Service, National Wildlife Refuge System • U.S. Fish and Wildlife Service, Pacific Islands Office, Ecological Services • U.S. Geological Survey, Pacific Island Ecosystems Research Center • U.S. Geological Survey, Pacific Islands Water Science Center • American Bird Conservancy • Hawaii Conservation Alliance • Kamehameha Schools Bishop Estate • Micronesia Conservation Trust • The Nature Conservancy

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Do you have climate work that you would like us to highlight in our next quarterly newsletter? Please send in submissions to the editors: snash@hawaii.edu & whitney.peterson@piccc.net To be added to or removed from the mailing list please also contact the editors by email.

Sarah Nash **Writers & Editors** Whitney Peterson