



## Our Vision

**Resilient and sustainable Pacific Island communities using climate information to manage risks and support practical decision making about climate variability and change.**

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## Pacific RISA: Year Four

The Pacific RISA has continued to extend its interdisciplinary multi stakeholder research and outreach to support the understanding of and responses to climate variability and change impacts in Pacific Island communities. During Year 4, the Pacific RISA program expanded its work throughout the Hawaiian archipelago and the US-Affiliated Pacific Islands using the 2012 Pacific Islands Regional Climate Assessment (PIRCA) as a springboard for diverse research and outreach activities. PIRCA workshops facilitated a knowledge exchange with many groups, including the Hawai'i Commission on Water Resource Management (CWRM), regarding the adaptive management of freshwater resources. Networks and gaps of information flow about climate change throughout the region have been identified, allowing the Pacific RISA team to build on existing linkages and to focus resources on areas that are underserved. Pacific RISA team members have contributed to workshops with water resource managers in the Republic of the Marshall Islands and American Sāmoa on resilience to drought and climate variability due to the El Niño/Southern Oscillation. New work in American Sāmoa is laying the foundation for assessing the value of multiple legal and policy tools aimed at supporting climate adaptation efforts.

## Pacific RISA Program Evaluation

In Year 4, the Pacific RISA team followed up on suggestions made by external program evaluator Dr. Susi Moser to broaden their visibility in the region by intensifying outreach and communication activities and exploring new collaborative opportunities with regional networks and organizations.

Subsequently, Dr. Moser completed an evaluation of the Pacific RISA program's success in reaching and influencing different audiences in Hawai'i and the Pacific region. She conducted key informant interviews, deployed an online survey, and analyzed event, website, and media data to 1) ascertain the perceptions of interest in and usefulness of the Pacific RISA-led 2012 PIRCA; 2) determine the geographic spread and reach of different types of stakeholders and capture interest in PIRCA information; 3) identify indicators of how the PIRCA was received; and 4) identify future information needs and ways to improve future assessments. The evaluation revealed that the PIRCA has done extraordinarily well in its outreach and influence. The Pacific RISA has been instrumental in providing timely input to the National Climate Assessment (NCA), for publicizing the PIRCA through highly visible media, and conducting inclusive, informative, and impactful outreach (Figure 1). The PIRCA has had a traceable impact on planning and policymaking at state and federal levels and has been accessed online over 1,300 times since its publication.

Dr. Moser's final report was delivered in December 2013 and shared with Pacific RISA partners, the RISA program office, and NCA/US Global Change Research Program (USGCRP) partners (Moser 2013). Recommendations from the evaluation suggest opportunities for future directions of PIRCA and NCA outreach and sustaining regional assessment efforts. Some report findings include:

### **Pacific RISA's recognized and unique strengths**

- The Pacific RISA provided timely input to the NCA.
- They were principally responsible for ensuring that the PIRCA was publicized through highly visible media.
- The Pacific RISA conducted inclusive, informative, and impactful outreach.
- The PIRCA is widely perceived as a high-quality, useful document that stakeholders view as salient, legitimate, and extremely credible.
- The PIRCA has had a traceable impact on planning and policymaking at state and federal levels. To date it has served as a reference document, a source of information for speeches by political leaders, backing for policy initiatives, and motivation to rethink management approaches.



Image 1: The Pacific Islands Regional Climate Assessment, or PIRCA, report was the focus of the Year 4 evaluation process. Here, Dr. Keener opens the meeting with a summary of the report findings during the release event in Honolulu, Hawai'i.  
Photo by Diana Kim.

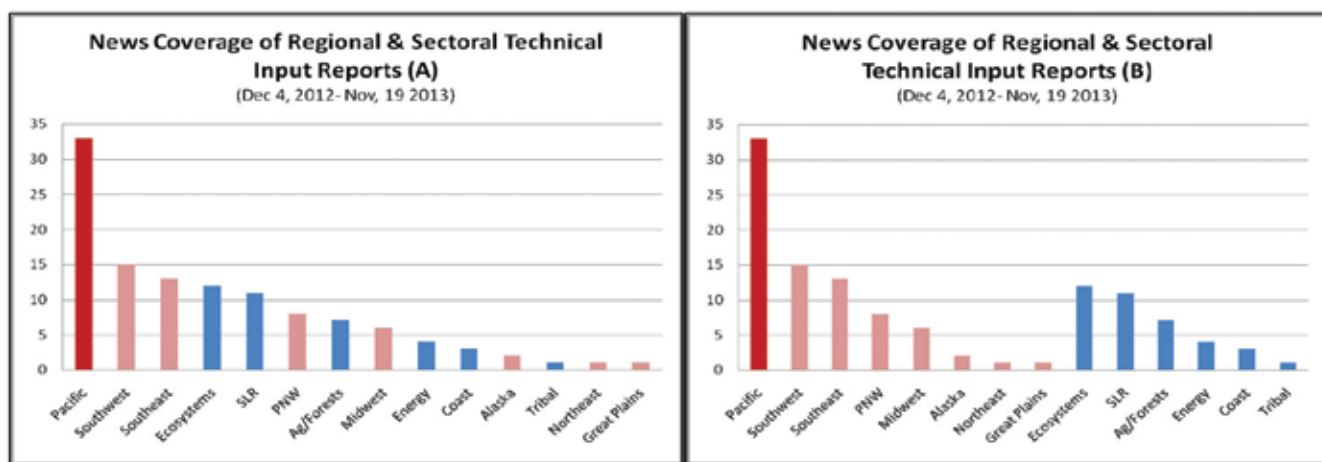


Figure 1: Comparison of news coverage for technical input reports for the NCA release. When coverage of the reports is ranked by region and sector together (left), and separately (right), the Pacific region had by far the most impact. Source: Moser 2013.

## Hawai'i-Pacific Highlights of the Third US National Climate Assessment

On May 6, 2014 the East-West Center and Pacific RISA hosted a briefing for the release of the Pacific Islands Regional chapter of the Third National Climate Assessment. Moderated by Pacific RISA Principal Investigator (PI) Dr. Victoria Keener, the event featured an introduction by William Aila, Director and Chair of the Hawai'i Department of Land and Natural Resources, as well as a panel of authors from the Pacific chapter of the report. The briefing was well attended by local media, including three local TV stations that featured the event on the evening news. More than 80 people were in attendance, including Rep. Chris Lee, Chairman of the House Environment committee; Bill Tam, Deputy Director of the Department of Land and Natural Resources; other state and federal employees working on climate change; staff members from Rep. Hanabusa and Rep. Gabbard's offices; University of Hawai'i (UH) faculty; East-West Center staff; and students. Local news stations, Hawai'i Public Radio, and print media conducted interviews with Pacific RISA team members Drs. Keener and John Marra, resulting in highly visible news reports and publications, including articles in SCIENCE magazine and the Huffington Post. A video of the briefing can be found at <http://vimeo.com/94289546>.



**Image 2: Dr. Keener moderates a panel of authors representing the Hawai'i and Pacific Islands chapter of the newly released 2014 US National Climate Assessment. The well attended public event featured statements from the authors as well as a moderated discussion between the panel and decision makers and natural resource managers from the local, state, and national levels.**

**Photo by Rachel Nunn.**

## Research Updates

### Climate Adaptation Policy Research

The water policy white paper produced by Pacific RISA and the Center for Island Climate Adaptation and Policy (ICAP; Wallsgrove and Penn 2012) has been well received by Hawai'i water managers. Extending this work, East-West Center Project Specialist Richard Wallsgrove is now undertaking an analysis of American Sāmoa's water management scheme, with a special focus on adaptation. The need for adaptive tools is especially acute in the context of managing vital water resources. The assessment describes American Sāmoa's water resources and then identifies patterns of climate change and variability that could strongly impact freshwater quality and quantity including: 1) changes in rainfall; 2) changes in stream flow; 3) increasing temperature; and 4) changes in sea level. Stakeholder insights into freshwater issues in American Sāmoa will be combined with results from existing studies on groundwater and surface water to better understand the context for decision making, and preliminary results indicate there is a need for expanded water quality monitoring and further assessment of potential alternative sources of clean drinking water. Although American Sāmoa enjoys relatively abundant resources, developing and maintaining sustainable water sources is a clear priority for government, business, and water users at the village level. Overall, the lack of high quality, consistent data makes it difficult to determine trends in water quality and anticipate possible future problems associated with climate variability and change.

### American Sāmoa Groundwater Sustainability Study

The UH Water Resources Research Center (WRRC) is evaluating the future sustainability of groundwater resources in American Sāmoa, led by Pacific RISA PI Dr. Aly El-Kadi, UH graduate student Christopher Schuler, and American Sāmoa Community College (ASCC) faculty member Randy DeWees. Planning and project development has occurred throughout the reporting period with input from partner agencies, including the American Sāmoa Power Authority (ASPA), American Sāmoa Environmental Protection Agency (ASEPA), and the ASCC. To date, the study team has: 1) reviewed hydrologically and geologically relevant literature for the region; 2) compiled a GIS database of the historical water quality record; and 3) completed water quality analysis for all samples collected in 2013. More samples were collected during the summer of 2014 (Image 3). Strong relationships with local partners have been formed, and the team has developed a preliminary understanding of the correlation between anthropogenic activities and nutrient contamination of groundwater.

The research team continues to:

- Identify potential contaminant sources in well capture zones.
- Assess each well under the direct influence of surface water to evaluate potential freshwater contribution.
- Identify potential land use impacts to the wells, including inputs from soils, fertilizers, cesspools, septic tanks, and piggeries.

Development of a conceptual hydrological model (MODFLOW) for the island of Tutuila, American Sāmoa, is underway, with continued data acquisition for calibration and recharge. The model will estimate sustainable aquifer yields under current and future water uses, including a limited number of scenarios of drought and land use changes, and incorporating climate effects where climate data is available.



**Image 3: Faga'alu stream sampling for dissolved radon, nutrients, and isotopes.  
Photo by Christopher Schuler.**

## **Drought and Freshwater Resources in the US-Affiliated Pacific Islands**

In collaboration with partners from the Pacific Regional Climate Information System (PaCIS) and the Pacific Islands Climate Science Center, Pacific RISA PIs Drs. Keener and Finucane, with Project Assistant Duncan McIntosh, supported the development of a Drought Dashboard for the Republic of the Marshall Islands (RMI) by identifying key characteristics of: 1) regional stakeholders; 2) climate-sensitive decisions and information needs; and 3) the broader contextual factors that influence drought management decisions. Interviews were conducted with decision makers from a range of organizations, including the College of the Marshall Islands, the International Federation of the Red Cross, the Micronesia Conservation Trust, NOAA National Weather Service and Weather Service Office, the US Department of Agriculture, and the US Forest Service. Information from the final stakeholder report was instrumental in the development of the Drought Dashboard for the RMI, and Mr. McIntosh delivered a talk on preliminary findings at the project workshop, “Pacific Islands Climate Services Dialog: Preserving Freshwater Resources and Minimizing the Impacts of Drought,” in Majuro, RMI, April 2014.



**Image 4: Coral reef ecosystems such as this one in Fagatele Bay National Marine Sanctuary in American Sāmoa are experiencing multiple climate-related stressors.  
Photo by Krista Jaspers.**

Pacific RISA Research Fellow Dr. Laura Brewington and Project Assistant Krista Jaspers attended the “Preserving Freshwater Resources and Minimizing the Impacts of Drought” workshop in Pago Pago, American Sāmoa in July 2014. Workshop participants included community freshwater managers and planners, decision makers, and climate experts from American Sāmoa, Sāmoa, Fiji, Tonga, and Hawai‘i. At the workshop, Dr. Brewington presented the initial results of Richard Wallsgrove’s report (this newsletter, page 5).

The presentation evaluated the effectiveness of American Sāmoa’s adaptive policies and planning tools next to the criteria of being forward-looking, adaptive, integrated, and iterative, and suggested nine opportunities in which adaptive capacity could be improved in American Sāmoa. UH graduate student Christopher Schuler gave a presentation on his research describing the status of a groundwater model for the island of Tutuila being developed by the WRRC. Through the collaborative efforts of the workshop participants, local knowledge was combined with specialist technical advice to identify accurate, timely, and regionally relevant content that helps to preserve freshwater resources and minimize the impacts of drought. As a result of the dialogue, the user community is better informed about the current state of knowledge of climate variability and its impacts, and the provider community is better informed about what problems and questions are most relevant and better able to match products and services to user requirements (Image 5).



**Image 5: Participants at the workshops in American Sāmoa (Top) and RMI, respectively.  
Photos by Krista Jaspers and Duncan McIntosh.**

## Climate Projections for Hawai'i and the US-Affiliated Pacific Islands

The International Pacific Research Center (IPRC) evaluated the CMIP5 global models for their ability to simulate climate fields around major Pacific Island groups, performing and evaluating extensive high resolution (3 km and 1 km) Hawai'i regional climate model (HRCM) simulations for Hawai'i and compared to late 20th century observations (1990 to 2009). Conditions for late 21st century (2080 to 2099) were simulated at the 1 km grid scale for Maui, and efforts were begun to extend those simulations to other Pacific Islands. This research is being used as an input to efforts conducted by the Pacific RISA and the US Geological Survey (USGS) to assess the effects of projected climate changes on aspects of the natural and manmade environments of interest to Hawai'i. Specific outcomes during the reporting period include:

- “Present day” (1990 to 2009) simulations with the 3 km HRCM capture the overall observed pattern of rainfall within the state of Hawai'i.
- Major interannual fluctuations of rainfall are well represented by the model, including the complicated structure of the diurnal rain cycle.
- “Future” (2080 to 2099) projection results for Hawai'i indicate a warming of the long-term mean surface air temperature, with the largest warming expected at higher elevations.
- Mean rainfall patterns are also projected to change significantly (up to 30%), with increased rainfall over areas that currently have high mean rainfall, and decreasing rainfall over currently dry areas (i.e., wet areas get wetter and dry areas get drier).

## Estimating Changes in Groundwater Recharge under Future Climate Conditions

Pacific RISA and the USGS Pacific Islands Water Science Center (PI-WSC) are estimating changes in groundwater recharge under future climate conditions on the island of Maui, Hawai'i. Previous streamflow research by the USGS found significantly decreasing trends in the dry season months (May to September) across the state of Hawai'i, with significant dry season decreases since 1990 at half of the sites on Maui. During Year 4, a water budget model was developed for the island of Maui to derive preliminary estimates of groundwater recharge using dynamically downscaled climate input datasets from the IPRC, preparing projections of rainfall, direct runoff, evapotranspiration, and groundwater recharge by aquifer system. A modified 2010 land cover surface for Maui was developed based on recent aerial photography, satellite imagery, and ground truth data to serve as the baseline input for the water budget model. Other climate input datasets of rainfall and reference evapotranspiration were developed, and 20-year IPRC climate simulations from 1990 to 2009, and projections from 2080 to 2099, have been run to evaluate hydrological processes under the current land cover scenario. Key findings comparing water budget output using future and control climate scenarios for a 2010 land cover condition indicate a 29% increase in mean annual rainfall, a 54% increase in mean annual direct runoff, and a 26% increase in mean annual recharge. Additionally, the model predicts that regions of Maui that are the wettest now will get wetter, while some dry regions get wetter and others get drier. At the seasonal scale, findings show decreased rainfall concentrated in central Maui during the dry season (Figure 2).to identify opportunities for implementing adaptive concepts into existing (and already-funded) management strategies.



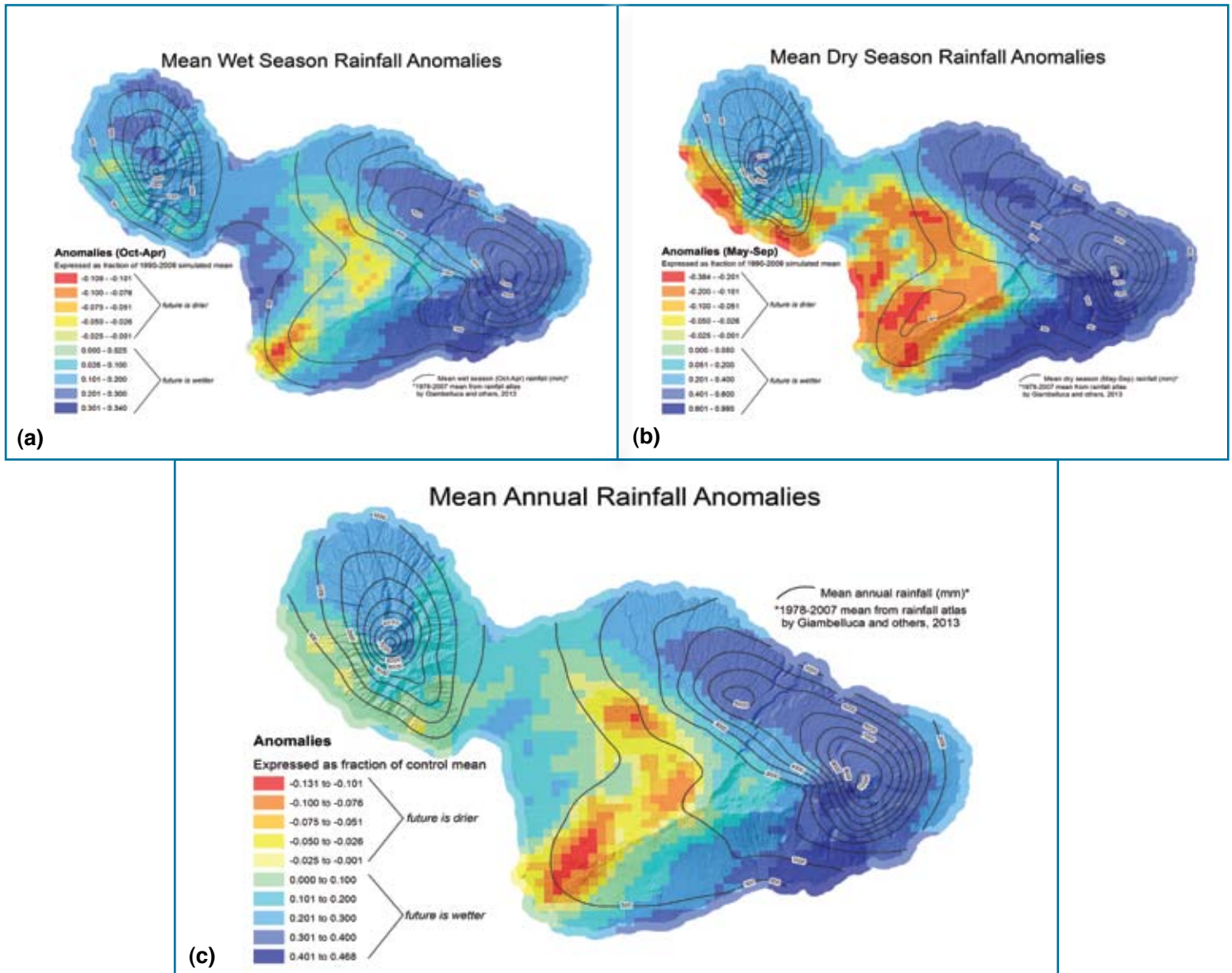


Figure 2: (a) Wet season (October to April); (b) dry season (May to September); and (c) annual rainfall anomalies for Maui, HI, calculated by the IPRC using dynamically downscaled climate models at the 1 km grid scale. Anomalies are expressed as a fraction of the control mean, derived by subtracting simulated current 20-year rainfall (1990 to 2009) from projected future 20-year rainfall (2080 to 2099). At the seasonal scale, wet-season rainfall is projected to increase in already-wet areas of East Maui, while in the dry season, already-dry central and leeward areas are projected to receive less rainfall. (Zhang et al, article in preparation)

Feedback following presentations that described these preliminary findings raised questions about apparent inconsistencies between 1) previously observed downward trends yet projected future increases in rainfall and 2) climate projections derived from statistical downscaling and those derived from dynamically downscaling. Collectively, there is a need for developing a credible explanation for these differences. Ongoing USGS activities use the water budget model to simulate future groundwater recharge for three additional land cover scenarios being developed by Pacific RISA using future climate projections from the IPRC. Manuscripts and white papers describing the methods and results are anticipated in early 2015, and Pacific RISA and the USGS continue to present results at regional and national conference proceedings.

## Maui Groundwater Recharge Future Scenario Development

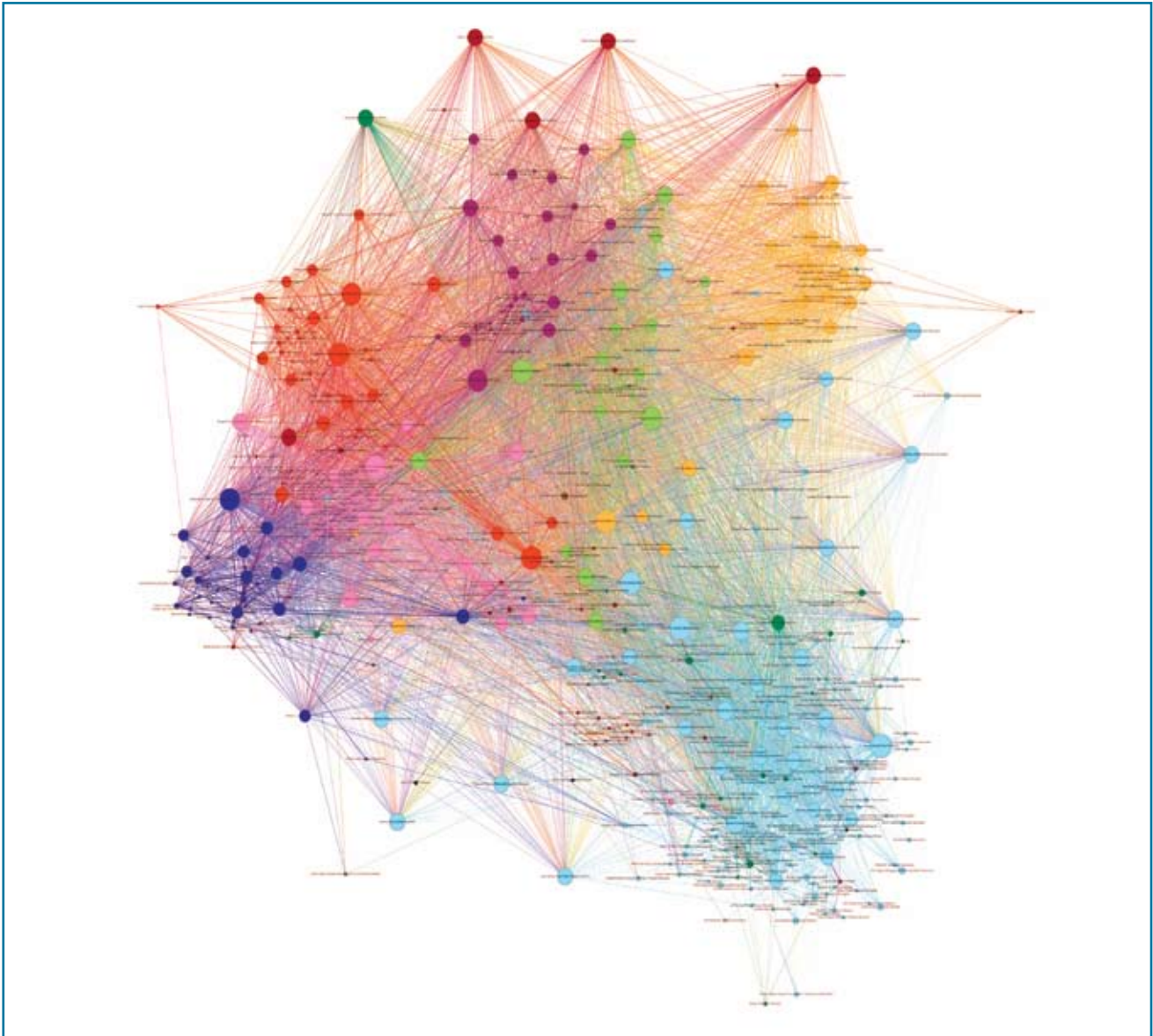
Drs. Keener, Finucane, and Brewington, are working with Maui stakeholders to refine inputs to future climate and land cover scenarios, to inform groundwater modeling being conducted by the USGS WSC. To date, there have been 30 meetings held with stakeholders on Maui and Oahu, which have been instrumental in the development of land cover maps to serve as inputs into the USGS water budget model. Stakeholders include city, county and state planning and natural resource management agencies (Hawai'i Commission on Water Resource Management, County of Maui Department of Water Supply, County of Maui Planning Department, Hawai'i Department of Agriculture, Hawai'i Department of Land and Natural Resources), representatives from agriculture and ranching, watershed partnerships, The Nature Conservancy, the National Park Service, and others.

The objective of the RISA team has been to determine the impact on Maui's groundwater supplies by looking at different management scenarios with respect to climate change. The RISA team have created three land cover maps to represent plausible land management futures on Maui. These land cover classes correspond to decisions related to: 1) native and alien forest; 2) agriculture and ranching; 3) urban development and expansion; 4) streamflow restoration; and 5) new recharge sources. The USGS model will be used to identify hotspots of future groundwater stress and climate by comparing scenario output with the baseline of current climate and current land cover on Maui, and results will assist in translation to stakeholders for direct incorporation into the Hawai'i Water Resources Protection Plan and the Maui Water Use Development Plan.

## Social Network Analysis

Dr. Keener and East-West Center Pacific RISA Research Fellow Dr. Kati Corlew carried out a network analysis survey among climate change professionals in the Pacific Islands between December 2012 and March 2013, collecting information on professional and personal demographics, network connectedness, climate change risk perception and resiliency, and sense of community from over 300 participants (Figure 3). The study sought to identify both spatial and knowledge-related climate information gaps and utilize successful networks to link isolated sectors, groups, and islands into established networks. Prior to the study there were no formal analyses that quantified and tracked the flow, sources, and quality of climate knowledge and risk perception in the region, where geographic isolation and large distances between information hubs makes collaboration and communication about climate knowledge essential. Findings on network connectedness include:

- The more strongly participants are connected to the network, the more strongly they feel connected to the network.
- Participants' sense of connection strength to the network is true for both local networks as well as a large Pacific-wide community of climate change professionals.
- The effect is nearly twice as strong for sense of community with local communities.



**Figure 3: Pacific Islands region full map from Pacific RISA Social Network Analysis. Palau – dark blue, Hawai'i – light blue, Guam – light green, Federated States of Micronesia – light purple, Northern Mariana Islands – dark purple, Republic of the Marshall Islands – red, other Pacific Islands – dark red.**

Additionally, significant differences in sense of responsibility and control for addressing climate change were found between regional networks. In Guam, for example, respondents felt a moderate sense of responsibility, but no corresponding sense of control, while the Federated States of Micronesia felt a strong sense of personal responsibility and a moderate sense of control (Table 1). In early 2014, the full network maps were published on the Pacific RISA website and disseminated through the project mailing list to regional collaborators, where users can explore the dense international and interdisciplinary communication networks within the region, and identify current or potential collaborators whose professions or regions of focus overlap. To evaluate the functionality and uses of the network maps across the region, a very short survey was launched in May 2014 to measure: 1) how useful stakeholders found the maps; 2) what kinds of activities were being supported with the information; and 3) ways to improve the reach and functionality of the products.

**Table 1: Percentage of respondents who felt a moderate to very strong sense of (a) personal responsibility to act to address climate change or (b) ability to control the impacts of climate change on their island or in the Pacific Islands generally.**

Sense of Responsibility	American Sāmoa	FSM	Guam	Hawai'i	RMI	NMI	Palau
To what extent do you feel personally responsible to act to address climate change <u>on the island where you live?</u>	52.7	62.9	31.8	44.0	55.6	43.8	64.3
To what extent do you feel personally responsible to act to address climate change <u>on Pacific Islands generally?</u>	21.1	54.3	22.7	36.0	33.3	43.8	35.7

Sense of Control	American Sāmoa	FSM	Guam	Hawai'i	RMI	NMI	Palau
To what extent do you feel able to control the climate change impacts <u>on the island where you live?</u>	0.0	21.2	0.0	0.8	22.3	18.8	7.1
To what extent do you feel able to control the climate change impacts <u>on Pacific Islands generally?</u>	5.3	37.2	0.0	1.8	27.8	0.0	7.7

## Related Research

### Disasters and Climate Change Risk Perception and Preparedness

Dr. Corlew launched a pilot project to explore the influence of context on psychological disaster recovery and perceived risk of future disasters due to climate change on Maui island, Hawai'i and American Sāmoa. Through Visionary Grant funding from the American Psychological Foundation, the project explores the benefits to psychological disaster recovery in addressing individual agency and capacity in the context of perceived risk. On Maui, an online survey, qualitative interviews, community presentations, and stakeholder-guided discussions were carried out. In July 2014, the data collection was completed in American Sāmoa, followed by community presentations and guided discussions. Following data analysis and reporting, Dr. Corlew will use the results from preliminary work to pilot an iterative model for culturally and community responsive climate service development in two unique settings and evaluate the model for future use in large-scale implementation across the Pacific Islands region.

## Water Resources on Guam

Drs. Finucane and Keener are PIs on a Strategic Environmental Research and Development Program (SERDP) funded project in Guam focusing on the potential impacts of climate change on water resources and adaptive responses on Department of Defense (DoD) Installations. (Image 6). As part of this interdisciplinary project, they are working to understand the context in which DoD natural resource managers and decision makers in the government of Guam make decisions about how to manage and allocate future freshwater resources, and how a changing climate may affect these decisions. In conjunction with a diverse set of stakeholders, they will research the most effective and helpful ways to translate the hydroclimatological projections generated by the research team into actionable and understandable management information. This research will help stakeholders from Guam become more integrated into the larger circle of freshwater and climate decision makers in the region.



**Image 6: Pacific RISA and USGS researchers introduce the project background to a diverse group of stakeholders in Guam. Photo by Victoria Keener.**

## Outreach Activities

### Media and Outreach Events

The Pacific RISA team has been involved in numerous outreach and media events during the past year (Image 7). Some of these events included the Women in Climate Change event at the University of Hawai'i (February 2014), The Pacific Risk Management 'Ohana Conference (March 2014), and the National Climate Assessment Release event at the East-West Center (May 2014).



**Image 7: Top Row, Hawai'i Water Forum and Pacific Islands Leadership Program presentations. Bottom Row, Women in Climate Change event and Earth Day celebrations. Photos by Rachel Nunn.**

## Communication Platforms

Social media and the Pacific RISA website ([www.pacificrisa.org](http://www.pacificrisa.org)) have again been main components in reaching regional and international audiences and organizations for Pacific RISA this past year. The Pacific RISA Facebook page has over 300 likes and some posts have reached double that amount of users. The Pacific RISA Twitter account also continues to be an active and effective method of outreach.

The Pacific RISA website has been continually updated and upgraded over the last year with new features such as the Maui Groundwater Project, listed under the main Projects Menu as Climate Scenarios, the availability of country-specific maps and tools under the Social Network Analysis project, updated videos and presentations to media, and the blog/news page.

## Policy-Related Support

In August 2013, US Senator Brian Schatz (D-Hawai'i), Chairman of the Energy and Natural Resources Subcommittee on Water and Power convened a conference on freshwater sustainability in Hawai'i. Dr. Keener spoke about Pacific RISA projects and climate and freshwater needs and gaps, and Senator Schatz announced the SECURE Water Amendments Act of February 2014 (S.2019) to conserve water resources and promote sustainability. The SECURE Water Amendments Act will expand grants and increase funding for water conservation and drought projects, provide resources for better data collection and analysis of water supply and use, and make Hawai'i water conservation projects eligible for grants, all ideas put forward during the August 2013 meeting to increase Hawai'i's freshwater security in the face of climate change. The Senate bill is co-sponsored by Senators Martin Heinrich (D-New Mexico), Mazie Hirono (D-Hawai'i), Mark Udall (D-Colorado), Tom Udall (D-New Mexico), and Ron Wyden (D-Oregon).

Governor Neil Abercrombie of Hawai'i was appointed as a member of President Obama's Climate Change Task Force, and convened a report titled "Navigating Change: Hawai'i's approach to adaptation – Report for the First Meeting of State, Local and Tribal Leaders Task Force on Climate Preparedness and Resilience" in December of 2013. The draft of this document was revised by several Pacific RISA and PIRCA members, and recommends actions in language taken directly from the NOAA RISA program (see Recommendation #1: Provide actionable information for local decision making and the island context. First step: Support Task Force members' engagement of local stakeholders to develop specific recommendations and expedite the development and delivery of priority technical assistance). Figures co-created by Pacific RISA and PIRCA are also featured in the report.

Download the Navigating Change document at: <http://governor.Hawai'i.gov/wp-content/uploads/2014/01/Navigating-Change-12914.pdf>

The Pacific RISA document "Water Resources and Climate Change Adaptation in Hawai'i: Adaptive Tools in the Current Law and Policy Framework" was published in 2012, and author Richard Wallsgrrove spent the next 12 months traveling across Hawai'i to hold workshops introducing decision makers and resource managers to the toolkit's suggestions and gathering feedback. As part of the outreach, Mr. Wallsgrrove held a special session with CWRM, in which many of the suggestions were met with enthusiasm. The next year, CWRM approached the Pacific RISA about incorporating climate change projections and planning into their revision of the Hawai'i State Water Resources Protection Plan (WRPP), one of the toolkit's recommendations. Since then, the Pacific RISA has been working on future climate scenario development including CWRM as stakeholders. Ideally, finished scenarios of groundwater recharge and land use under future climate on Maui will be integrated into the revision of the WRPP later this year.

## New Initiatives and Collaborations

### Ecosystem Services and Climate Change

Pacific RISA is continuing outreach and meetings with CWRM to support their adaptation-related efforts. Dr. Keener was invited to present findings from the 2012 PIRCA to CWRM at their March 2013 public meeting, and researchers Drs. Finucane, Keener, and Alan Mair presented background information and discussed a potential climate scenario framework to a group of 10 CWRM staff.

### Regional Collaborations

The level of understanding of the mission and values of the Pacific RISA project has increased as a result of outreach and strategic partnerships. Major regional organizations have valued scientific reports and contact with the Pacific RISA team and their collaborators.

- PIRCA report visibility – Following on the evaluation done by Dr. Moser, Pacific RISA has taken active steps to address the gap in PIRCA report visibility on the websites of regional organizations. The PIRCA report can now be accessed on the Pacific Climate Change Portal, Pacific Disaster Net (part of the Secretariat of the Pacific Community, SPC), and Pacific Centre for Environment and Sustainable Development Knowledge Centre (part of The University of the South Pacific, USP) websites. PIRCA visibility has made Pacific RISA the go-to institution for climate change information in the region, proving important and useful to researchers and practitioners as a comprehensive information source, as a consensus document in political/policy contexts where action needs scientific backing or justification, as a communication and education tool, and as a research agenda-setting document.
- Strategic partnerships – Strategic partnerships have been strengthened with the Secretariat of the Pacific Regional Environment Programme (SPREP), based in Sāmoa, and USP through its 12 member countries, climate change projects, and in-country specialists. SPREP and the East-West Center have since entered into an official Memorandum of Understanding (MoU) to increase regional collaboration between the two entities effective October 29, 2014 for 5 years.



## Key Presentations and Meetings Attended

Keener, V. **Impacts and Indicators of Climate Change in the Pacific Islands**. East-West Center seminar, East-West Center, Honolulu, HI. July 13, 2013.

Keener, V., Marra, J., Spooner, D. **Pacific Islands Regional Climate Assessment** Pacific Islands Climate Change Cooperative webinar, online. July 11, 2013.

Corlew, K. **Human Dimensions of Climate Change in the Pacific**. 2013 Environmental Education Symposium (Environmental Literacy In and Out of the Classroom). Hawai'i Convention Center, Honolulu, HI. July 15, 2013.

Keener, V. & Finucane, M.L. **Climate Change Impacts in the Pacific: Implications for US Environmental and Human Security**. United States Congressional Briefing, co-sponsored by Sen Brian Schatz. Dirksen Senate Office, Washington, DC September 17, 2013.

Keener, V. **Climate Change in the Pacific Islands**. Smithsonian, National Museum of Natural History, "Scientist Is In" lecture, NMNH, Ocean Hall, Washington, DC. September 18, 2013.

Keener, V. **Climate Change Impacts in the Pacific: Implications for US Environmental and Human Security** Science Policy guest lecture, Potomac Institute for Policy Studies, Arlington, VA. September 20, 2013.

Keener, V., Nunn R., Corlew, K. **Climate Change in the Pacific Islands**. Guest Speakers - Pacific Islands Leadership Program (PILP), East-West Center, Honolulu, HI. October 16, 2013.

Keener, V. **Impacts of Climate Change on Water Resources in Maui**, Hawai'i Water Works Association Meeting, Kihei, Maui, HI. October 24, 2013.

Hamilton, K. **Regional Climate Change Projections for Hawai'i**. 2nd JIMAR/PIFSC Symposium: Climate and Change, East-West Center, Honolulu, HI. November 19, 2013.

Finucane, M.L. Presented a paper – **PIRCA: US Environmental and Human Security**. Climate Change and Security Risks and Opportunities Symposium, Washington, DC. January 28-30, 2013.

Finucane, M.L. **PIRCA Perspectives on Lessons Learned**. National Climate Assessment's Scientific and Engagement Innovations Workshop, Washington, DC. January 28-30, 2013.

Keener, V. **Developing a Drought Dashboard for the Republic of the Marshall Islands**. Pacific Risk Management 'Ohana Conference, Hawai'i Convention Center, Honolulu, HI. March 12, 2013.

Nunn R. **Media Messaging in Disasters**. Pacific Risk Management 'Ohana Conference, Hawai'i Convention Center, Honolulu, HI. March 13, 2013.

Keener, V. **Participatory Scenario Planning for Climate Change Adaptation: The Maui Groundwater Project**. Geography Seminar on Climate Change. UH Mānoa, Honolulu, HI. April 3, 2014.

Brewington, L. **Participatory Scenario Planning for Climate Change Adaptation: The Maui Groundwater Project**. Association of American Geographers Annual Meeting. Tampa, FL. April 9, 2014.

- Keener, V. **Network Connectedness and Risk Perception of Climate Change Professionals in the Pacific Islands**. Association of American Geographers Annual Meeting, Tampa, FL. April 9, 2014.
- McIntosh, D. **Developing a Drought Dashboard for the Republic of the Marshall Islands**. Pacific Islands Climate Services Dialog - Preserving Freshwater Resources and Minimizing the Impacts of Drought, International Conference Center Majuro, Republic of the Marshall Islands. April 24, 2013.
- Brewington, L. **Climate Change Impacts in the Pacific: The Maui Groundwater Project**. Department of Hawaiian Studies Seminar on Climate Change in Oceania. UH Mānoa, Honolulu, HI. April 25, 2014.
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**Image 8: The Pacific RISA works with diverse sectors of decision makers and resource managers to incorporate climate information into planning initiatives. By engaging different stakeholders, adaptation needs can be evaluated and options weighted. In this picture, a native 'ōhi'a lehua tree topping a ridge in Honolulu overlooks an agricultural plain and Pearl Harbor, an estuary used heavily by the US Military. Photo by Victoria Keener.**



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