

1. **Award Title: Climate Adaptation Partnership for the Pacific (CAPP): Pacific Regional Integrated Sciences and Assessments (RISA) Phase II**
2. **Performance Period: June 1, 2014 to May 31 2015**
3. Who are your **team members**? Please include graduate students and post-doctoral researchers in this list. (*alphabetical listing*)

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4. What are your **new areas of focus or partnerships** that have begun this past year?

***Developing Climate Indicators in the US-Affiliated Pacific Islands - American Sāmoa and the Republic of the Marshall Islands***

As a result of the 2012 Pacific Islands Regional Climate Assessment (PIRCA) process, the editors and authors of the report wanted to collaborate to more fully assess and develop climate services for the United States Affiliated Pacific Islands (USAPI) in further PIRCA work. The Pacific RISA, NOAA Pacific Islands Regional Climate Services Director (RCSD), and the Department of Interior Pacific Islands Climate Science Center (PICSC) have embarked on a collaboration that will support the development of a set of Pacific Island specific technical climate indicator variables, impact indicators, and management response indicators. The NOAA RCSD developed “drought dashboard” climate service prototypes for the Republic of the Marshall Islands (RMI) and American Sāmoa, and Pacific RISA contributed by identifying key stakeholders, sectoral information needs, and management realities on each island. With additional support from the PICSC, initial research discussions were held with a diverse group of stakeholders in American Sāmoa and Majuro, RMI, to start linking technical regional climate variable indicators with impact thresholds and management policy outcomes that will be relevant at the local scale for different economic sectors. This work will be expanded upon in the next Pacific RISA phase through the continued PIRCA process and sustained National Climate Assessment work.



**Image 1:** (a) Stakeholders participate in the Climate Indicators Research Discussions in Majuro, RMI; (b) Water tanks outside the College of the Marshall Islands. The majority of the freshwater supply in Majuro, the capitol of the RMI, comes from rainwater catchment systems such as these. (Photo credits: Victoria Keener)

### ***Assessing Sustainability of Groundwater Resources under Future Climate Conditions (Watershed Modeling) - American Sāmoa***

The University of Hawai'i at Manoa's (UH) Water Resources Research Center (WRRC) is evaluating the future sustainability of groundwater resources in American Sāmoa on Tutuila Island under historical, current, and future climate conditions. Led by Pacific RISA PI Dr. Aly El-Kadi, the research team includes graduate and post-doctoral fellows and local collaborators at the American Sāmoa Community College, and is working to incorporate dynamically downscaled climate data for American Sāmoa produced by the UH International Pacific Research Center (IPRC, expected results in summer of 2015). American Sāmoa lies in a highly climatologically variable region and has historically been vulnerable to water quality, drought, flood, and storm events. There has been no research into future climate impacts on freshwater dynamics on Tutuila Island, and there is limited capacity on-island for this kind of study. For these reasons, the Pacific RISA has made assessment and research here a priority.

The initial phase in watershed modeling is data collection, data analysis, and input data quality assurance. Due to the extremely limited hydro-meteorological data for Tutuila Island, the applicability of the MIKE-SHE<sup>1</sup> and Soil and Water Assessment Tool (SWAT) watershed models were first tested for He'eia watersheds in Oahu, Hawai'i, where climate data are more available. Based on these tests, the SWAT model was ultimately chosen for Tutuila Island. Modeling in American Sāmoa has focused on the Fagaalu watershed because it is identified as an area that is heavily impacted by anthropogenic activity and consequently yields high sediment loads to the adjacent coastal reef. Also, the US Coral Reef Advisory Group (CRAG) has classified the watershed as a priority for conservation and mitigation measures. While the scarcity of historically observed climate data has been a continuous challenge in the past, these new models will help resolve this issue. The UH teams working in Fagaalu are also collaborating with researchers from the San Diego State University (SDSU) Department of Geography. This collaboration has allowed the team to develop and calibrate SWAT for the watershed

based on the climate and streamflow data shared by the SDSU researchers from 2012 to 2014.



**Image 2:** *American Sāmoa Community College student intern Hugh Fuimaono takes samples of high level groundwater in the mountains of Tutuila. (Photo credits: WRRC research staff)*

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<sup>1</sup> MIKE-SHE integrated hydrological modelling system for building and simulating surface water flow and groundwater flow

***Climate Change Impacts on Human Health: Hawai'i Public Health Association***

Pacific RISA PIs Dr. Nancy Lewis and Dr. Victoria Keener were invited to a meeting with the Hawai'i Public Health Association (HPHA) to share information on potential impacts of climate variability and change on human health in the Hawaiian Islands, with emphasis on measurable freshwater quality and quantity impacts. This kickoff meeting led the HPHA to officially take a stand on addressing potential climate impacts on the health of Hawai'i's residents, and compelled state legislators to introduce a climate change and health bill that will more thoroughly assess the scope and risks of climate on health through the development of a statewide strategic plan. In May of 2015, HI HCR 108, requesting the convening of a climate change and health working group was adopted in its final form. Drs. Lewis and Keener were then invited to be on the working group, which will meet 12 times over the next year to identify risks and outline a statewide adaptation framework to address them. The collaboration with Hawai'i state legislators and the HPHA will continue to develop in the next Pacific RISA phase.

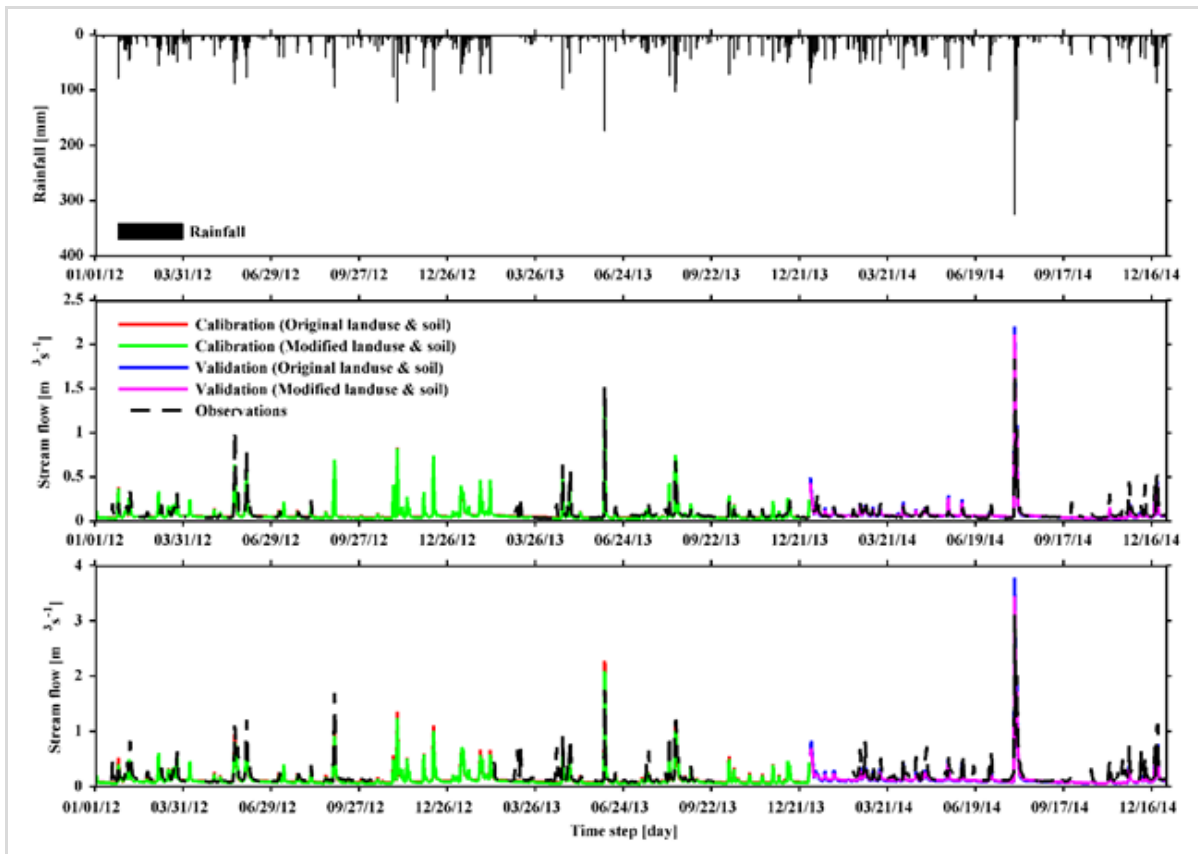
5. Please provide a list of up to 5 **research findings** – Please try to include examples that span disciplinary and interdisciplinary work.

***Assessing Sustainability of Groundwater Resources Under Future Climate Conditions - American Sāmoa***

As a model test bed for the largely ungauged American Sāmoa watersheds, the UH WRRRC hydrology group used SWAT modeling to demonstrate that the He'eia watershed on the island of Oahu, Hawai'i exhibits distinct and different model sensitivity to several key parameters when compared to large-scale continental watersheds. The calibrated model was used to assess the impact of rainfall and temperature changes on water balance. Results showed that a decrease in rainfall during the wet season and a marginal increase in the dry season will generally cause a decrease in water balance components. More importantly, the groundwater flow component was adversely affected by rainfall and temperature changes as compared to the other components, which may negatively impact the future sustainability of groundwater resources in the watershed.

Following the test run in Hawai'i, SWAT was successfully calibrated and validated for daily stream flow simulation of the Fagaalu watershed on Tutuila Island, American Sāmoa. Results show that the temporal evolution of stream flow hydrographs is well represented at the station level, indicating the applicability of the SWAT model to simulate daily stream flow. The findings suggest that the groundwater and lateral flows are the most important aspect of the total flow component for the Fagaalu watershed. Under current climate conditions, approximately 30% of the annual average precipitation goes to groundwater recharge and 30% is lost through evapotranspiration. The research also found that modification of the original land use and soil types considerably affects the water balance components of the Fagaalu watershed. Furthermore, this modification improved the performance of SWAT and the spatial pattern of average annual recharge distribution throughout the watershed, which has been clearly observed for the downstream urbanized area of the watershed. The results

generally indicate the importance of spatially distributed climate data, accurate characterization of land use, and soil properties for accurate watershed modeling.

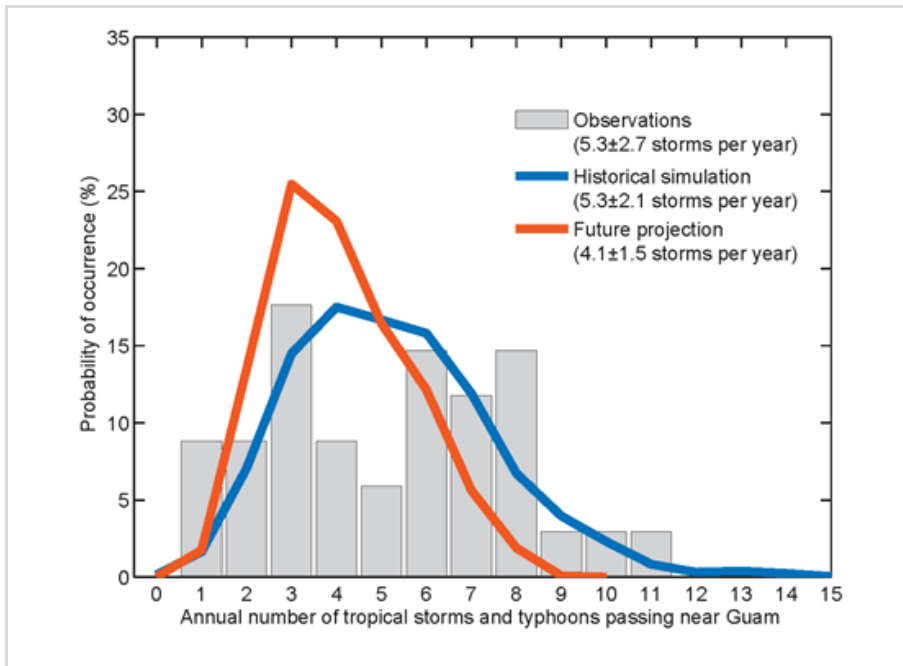


**Figure 1:** Daily rainfall (top) observed and simulated daily stream flow at the Dam (middle) and Lyndon Baines Johnson Tropical Medical center (LBJ) stations (bottom) for the calibration (2012–2013) and validation (2014) periods.

### **Climate Projections for Hawai'i and other Pacific Islands**

The UH IPRC climate research team has completed an assessment of 49+ CMIP5 global model integrations to see how well they perform in the tropical Pacific region, with an emphasis on Hawai'i, Guam, and American Sāmoa. This research developed and applied objective metrics to document the models' abilities to represent present-day precipitation and sea surface temperature climatologies, as well as dominant modes of climate variability such as the El Niño/Southern Oscillation (ENSO). From the pool of 49+ models, the research team selected the five models which "best" represent the current climate and its variability in the tropical Pacific region. In these top models, the association between ENSO and USAPI seasonal precipitation anomalies has been assessed. The IPRC team collaborated with the University of Reading developers of the "TRACK" tool to identify features of synoptic systems in the Pacific region. TRACK was applied to assess the models' ability to capture various features (e.g., genesis location, intensity, preferred path) of tropical cyclones that pass over the Pacific Islands, and found that the number of tropical cyclones expected to impact the Pacific Islands will

decrease, a finding which is consistent with other recent literature (see figure 2, below, for preliminary changes in probability of storm occurrence in the future around Guam in the western Pacific Ocean).

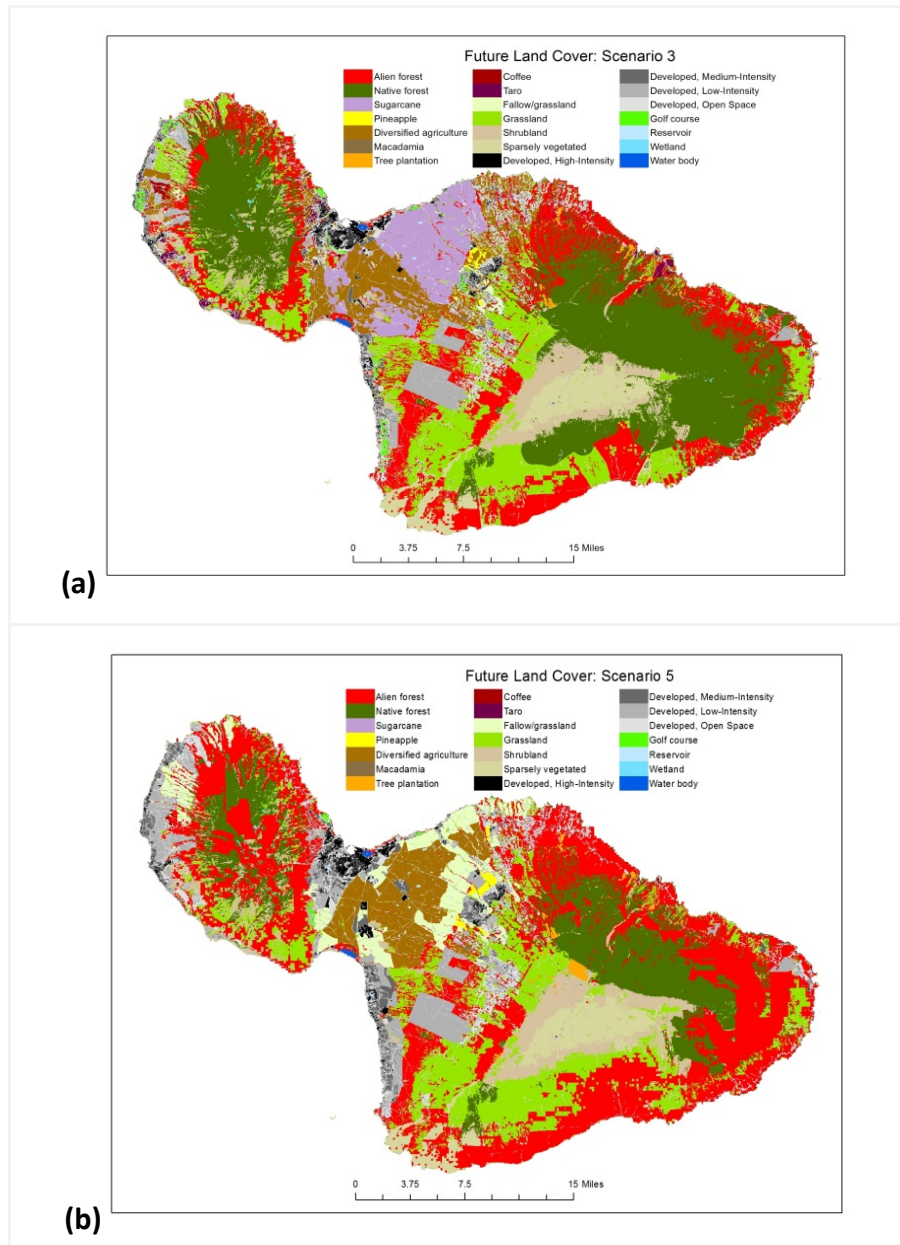


**Figure 2:** Frequency of tropical storms and typhoons for observations (1979-2012), simulations of the historical period (1976-2005), and the future climate with greenhouse warming (2071-2100). Thick lines indicate the multi-model average of four individual simulations. Mean and likely ranges of storm counts are listed. Simulations are scaled to remove model biases in storm genesis and tracks.

### ***Estimating Changes in Groundwater Recharge Under Future Climate Conditions - Maui Island, Hawai'i.***

The Pacific RISA, in collaboration with the USGS Pacific Islands Water Science Center (PIWSC), is estimating changes in groundwater recharge under future climate conditions on the island of Maui, Hawai'i. The Pacific RISA team led participatory scenario map-building meetings where information was collected, organized, and combined with diverse GIS data and metadata from different stakeholder groups. This information was used to construct four realistic future land use and climate scenario maps appropriate for use in the water budget model. Meetings were held with stakeholders representing large and small agricultural groups, ranchers, conservation groups, and state and county level regulatory agencies to reach consensus on the scenarios. In the end, consensus was reached by adding a scenario which represented a realistic compromise between high conservation and high development trajectories, leading stakeholders to recognize that urban development was not inherently opposed to environmental conservation under an uncertain climate future. The base case of 2010 land cover in Maui was run through the water budget model under historical versus projected end of century climate from the dynamically downscaled Hawai'i Regional Climate Model (HRCM), with

preliminary results showing wet areas getting much wetter, while typically dry areas varied. Increases at the island wide mean annual scale were seen in all hydrologic variables, including precipitation, runoff, and recharge. These preliminary findings may have direct implications on flood severity and erosion control for Maui County.



**Figure 3:** Two of the four future land use scenarios reflecting stakeholder interests in observed development, conservation, agriculture, groundwater recharge, and climate projections. **(a)** A future in which native forest conservation is actively pursued, and planned development and population growth are at the low end of projected estimates, in contrast to; **(b)** a future in which invasive forest is allowed to grow to its suitable habitat with a high estimate of urban growth and development.



**Climate and Freshwater Law and Policy Analysis in American Sāmoa**

East-West Center Project Specialist Richard Wallsgrove has been actively engaged in the analysis of American Sāmoa’s freshwater management policies through stakeholder engagement, focused research, and information-gathering. Key stakeholders include the American Sāmoa and United States Environment Protection Agencies, American Sāmoa Power Authority, and US National Park Service. 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. Preliminary results indicate there is a need for expanded water quality monitoring and further assessment of potential alternative sources of clean drinking water. Results to date also suggest that although American Sāmoa enjoys relatively abundant resources, a number of factors contribute to present and future risks to those resources. Developing and maintaining sustainable water sources is an obvious priority for government, business, and water users at the village level. Initial findings and nine specific opportunities to enhance freshwater resource adaptive capacity to climate impacts from this analysis were presented to stakeholders in American Sāmoa, in collaboration with the NOAA RCSD “drought dashboard” climate services meeting, allowing the technical climate variable indicator needs to be meshed with freshwater management and policy realities.

**Supporting Hawai’i’s Climate Adaptation Efforts: The Role of the Pacific RISA**

Independent Pacific RISA evaluator Dr. Susi Moser conducted a series of interviews with high-level Pacific RISA stakeholders to determine whether and how the RISA contributes to climate adaptation planning in Hawai’i, and to learn how the RISA’s work with the PIRCA continues to affect the state and region, Dr. Moser then shared the report with the Pacific RISA team. Relying predominantly on stakeholder interviews and supplementary document review, the evaluation found that the Pacific RISA shows:

- (1) Demonstrable impact on state-level adaptation policy-making;
- (2) Strong impact on adaptive state-level water management;
- (3) Beginning impact on adaptive local-level water management; and
- (4) Continued impact of the PIRCA in all policy realms, both in Hawai’i and the wider Pacific region (see Box 1, below, from Moser, 2015).

Perceived Usefulness	Actual Uses & Policy Impacts
One-stop-shop	Reference document, central repository of knowledge, background information
Staying current	Use in proposals, research
Credible source	Use in education
Research agenda-setting	Basis for presentations to others, for briefings
Accessibility to non-experts	Use in community outreach, communication and awareness-raising, with the media
Regional differentiation and specificity	Motivation to policy champions
Critical knowledge assessment	Use in policy-related speeches, as policy justification and back-up
Able to inform planning and action	Use in lobbying
	Use in review of development proposals
	Use in update of WRPP, Coastal Management Plan

**Box 1: Usefulness and actual uses of the PIRCA; Then and Now (Moser, 2015).**

6. Please provide a list of up to 5 **outreach activities** that you have undertaken in the past year.
- In September 2014, Project Specialist Wallsgrove was invited to present best practice findings from Pacific RISA's climate hazard assessment work at the United Nations Development Programme Workshop on Climate Adaptation and Risk Management in Kathmandu, Nepal. The workshop also provided an opportunity for Pacific RISA to evaluate and learn about approaches to climate adaptation across a spectrum of six developing countries where opportunities, needs, and resources may be similar to needs in developing portions of the Pacific region.
  - In October 2014, Dr. Keener traveled with 14 young leaders in politics chosen from across the US and the Asia-Pacific region as part of the East-West Center's New Generation Seminar (NGS) to Miami, Florida and Washington, DC to explore regional and federal level adaptation efforts to the impacts of climate change. Participants were able to meet with the NOAA Climate Program Office, as well as representatives from the US National Climate Assessment in Washington, and gained insight and connections into the national RISA program and how it interacts with policymakers at the local and national level as an example for how similar programs could work in their own countries or regions of the United States.

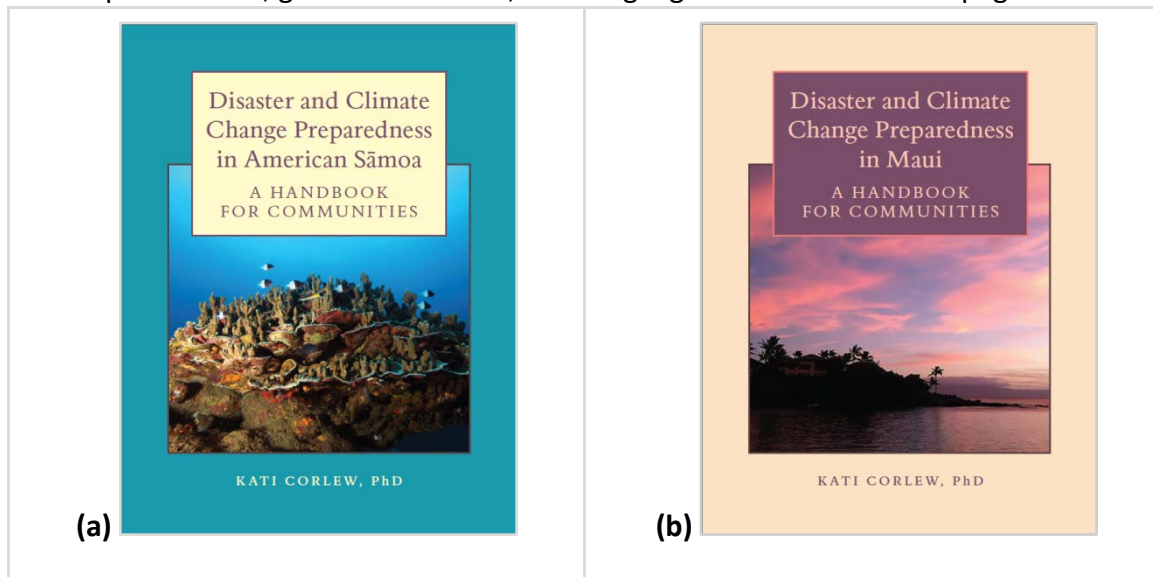


**Image 3:** NGS Participants speak on a climate adaptation panel moderated by Dr. Keener at the East-West Center office in Washington, DC. Left to right: Pan Tao, China; Prodyut Bora, India; Abhishek Shah, Nepal; Mark Stege, Marshall Islands; Victoria Keener, EWC.

- In April 2015, Dr. Keener participated in a climate change impacts and adaptation panel at the Conference on Island Sustainability at the University of Guam, and gave a talk on the importance of communicating climate science to interdisciplinary and public audiences. Outcomes included connecting with additional potential future collaborators from the USAPI, and strengthening cooperation with Guam-based climate adaptation groups at the University of Guam.
- Continuous outreach activities occur through the Pacific RISA's social media platforms such as Facebook and Twitter. A large demographic of Facebook fans comes from the United States, Australia and Fiji, and are between the ages of 25-

44. Twitter followers have increased from 110 followers in 2014 to 207 followers in 2015. Facebook saw an increase in traffic beginning in early 2015 as the content of posts diversified to include climate and health, climate induced migration impacts, and regional Pacific issues. The [Pacific RISA website](#) houses an updated collection of information and knowledge products generated through activities and research completed under the RISA team of lead investigators. The Pacific RISA also has regular email digests that are sent out quarterly or as needed to share news and important announcements.

7. Please provide a list of **key publications** from the past year - We are seeking ~ 5 publications, give or take a few, to be highlighted on the CPO webpage.



**Image 4:** Two community handbooks on Disaster and Climate Change Preparedness in American Sāmoa and in Maui, Hawai'i. This work was supported by the Pacific RISA and the East-West Center with funding from the American Psychological Foundation Visionary Grant. Disaster and Climate Change Preparedness publications for (a) American Sāmoa and (b) Maui Island, Hawai'i (Corlew, 2015)

- Corlew K., (2015). Disaster and Climate Change Preparedness in American Sāmoa: A handbook for Communities. Honolulu: East-West Center. Download at <http://www.pacificrisa.org/resources/publications/>
- Corlew K., (2015). Disaster and Climate Change Preparedness in Maui: A Handbook for Communities. Honolulu: East-West Center. Download at <http://www.pacificrisa.org/resources/publications/>
- Ferguson D.B., Finucane, M.L., Keener, V.W., Owen, G. (in press, 2015). Evaluation to Advance Science Policy: Lessons from Pacific RISA and CLIMAS. In Garfin, G. & Parris, A. Climate in Context. West Sussex, England: Wiley.
- Johnson, A.G., Engott, J.A., and Bassiouni, M., (2014). Spatially distributed groundwater recharge estimated using a water-budget model for the Island of

- Maui, Hawai'i, 1978–2007: US Geological Survey Scientific Investigations Report 2014–5168, 53 p., DOI: 10.3133/sir20145168.
- Finucane, M.L. & Keener, V.W. (2015). Understanding the climate sensitive decisions and information needs of island communities, *Journal of the Indian Ocean Region*, DOI: 10.1080/19480881.2015.1021181.
  - Moser, S. (February, 2015) Supporting Hawai'i's Adaptation Efforts: The Role of the Pacific RISA. Susanne Moser Research & Consulting, Santa Cruz, CA 9506.US
8. Please provide up to 3 narrative **examples** from the past year of plans, policies, strategies, tools, agreements, etc. that were proposed, adopted, and/or implemented as a result of prior RISA work.

***Hawai'i Department of Land and Natural Resources, Commission on Water Resource Management: 2014 Update of the Water Resources Protection Plan.***

In 2014 the Commission on Water Resource Management (CWRM) started the process of updating the State Water Resources Protection Plan, Hawai'i's primary and comprehensive water planning policy tool. Pacific RISA staff provided significant input and guidance on incorporating climate adaptation principles (see previous Pacific RISA research and outreach associated with Wallsgrove and Penn, 2012\*), and contributed to the evaluation of key physical resources and climate impacts. As a result, climate change adaptation has been added as one of five new key elements in this update, which includes law and policy research by Pacific RISA with regards to present and future climate impacts. The recently released draft chapter on drought planning utilizes climate information reported in Pacific RISA's work from the PIRCA (Keener et al., 2012), and CWRM has initiated a partnership with Pacific RISA on climate and policy research through the Maui groundwater recharge future climate scenarios project. The CWRM stakeholder engagement process has also incorporated a focus on climate change and adaptation.

\* Wallsgrove, R. and Penn, D. 2012. Water Resources and Climate Change Adaptation in Hawai'i: Executive Summary of Adaptive Tools, (Center for Island Climate Adaptation and Policy, Honolulu, Hawai'i), available at <http://icap.seagrant.soest.hawaii.edu/icap-publications>

***Hawai'i Department of Land and Natural Resources, Commission on Water Resource Management: Proposed Designation of New Water Management Area.***

Research by the Pacific RISA continues to contribute to efforts to designate the Keauhou aquifer (located on Hawai'i island) as a groundwater management area (WMA), a classification that requires existing and new source owners, with the exception of individual domestic users and those on rain catchment systems, to obtain a water use permit from CWRM and justify their withdrawals and uses. The petition for this designation relies in part on climate trends, and an increasing need to manage water resources at the Kaloko-Konokahau National Park from a climate adaptation standpoint. This is a potentially contentious issue amongst various Hawai'i island residents,

businesses, agencies, and other stakeholders, who resist what is perceived as additional top-down regulation. In the designation process, climate adaptation principles and future planning could easily be lost under the volume of public debate. Pacific RISA's research on climate adaptation and water policy has been included in the evidence supporting the WMA designation, and cited frequently in outreach materials and debate. In 2014, in a preliminary decision on the petition, CWRM ordered the development of refined forecasts of water demand and supply in order to reconcile land use planning with projected water supply and demand. This decision is consistent with the climate adaptation policy recommendations developed by Pacific RISA (Wallsgrove and Penn, 2012).

***Hawai'i Office of Planning: Funding Act 83, Sea Level Rise Adaptation.***

In 2014 Hawai'i's legislature passed Act 83, requiring the Office of Planning to establish an inter-agency climate adaptation committee to develop a sea level rise vulnerability and adaptation report, and implement strategic climate adaptation plans and policy recommendations based on the report framework. Act 83 cites the PIRCA, finding that "climate change is the paramount challenge of this century, posing both an urgent and long-term threat to the State's economy, sustainability, security, and way of life." For fiscal year 2014-2015, the Act allocated \$108,874 for staffing to coordinate the process of developing the initial focus of this plan on sea-level rise. The Department of Land and Natural Resources Office of Conservation and Coastal lands is leading the development of the initial report, which is due back to the legislature in 2017. Throughout the process, Hawai'i legislators have looked to the Pacific RISA for assistance in understanding and developing climate adaptation laws and policies.

9. How are you measuring the overall impact of your RISA team on decision-making in your region? For instance, how do you know what your program-level impact is?

***Theory Based Evaluation Program of Pacific RISA.***

The Pacific RISA has developed a theory-based evaluation process over the last funding cycle, comprised of both an internal project tracking system and the development of a comprehensive set of impact metrics, annual independent external reviews of different program components, and an overarching Action-Logic Model (ALM). External evaluations completed by Dr. Moser have included an assessment with Pacific RISA PIs to examine team roles and perceived strengths and weaknesses. They have also included interviews with close team collaborators and partners to better understand the perceptions and roles of the RISA in the larger region. In addition to this a survey and media analysis were undertaken to quantify the role of the Pacific RISA in the PIRCA/NCA process and traceable policy impacts. Some of the more recent research has concerned how the Pacific RISA contributes to climate adaptation planning in Hawai'i. This work, in turn, has informed the team about how the PIRCA continues to affect the state and region. A detailed listing of all respondents consulted as part of the Year 4 evaluation process is provided in Appendix 2. Most relevant for measuring program-

level impact, in the last two annual independent evaluations Dr. Moser's research was able to trace the Pacific RISA products to specific policy outcomes, mainly concerning the intersection of freshwater sustainability and climate change adaptation at the county and state level. Some quotes from the last annual report include (from Moser, 2015):

- "Climate change has definitely become part of our thinking, e.g. setting sustainable yields, looking for trends. It definitely now has a role in our decision-making process."
- "Climate change is more on our minds now than eight years ago."

When asked to discern what contributed to raised awareness of climate change, the latter interviewee mentioned the current drought in California, RISA's help in understanding natural variability, and the PIRCA report with its strong focus on Hawai'i.

One interviewee, in volunteering a mention of Wallsgrove and Penn's 2012 white paper, *Water Resources and Climate Change Adaptation in Hawai'i*, stated:

- "It challenged us to look at what we're doing. We've tried to incorporate some recommendations, it has influenced us."... "Things like that are helpful." ... "If they continue doing what they're doing that would be great."
- "The Wallsgrove paper was really eye-opening.... how we can incorporate climate change into our policy, not just setting limits but how to be more precautionary? ... I am really appreciative for it."

When asked specifically what state officials had done with that paper, one interviewee provided several specific examples: "[we] used it to get more sustained funding for our program, we're exploring the idea of a water use fee; it's led to improvements in monitoring and reporting of water consumption, and we're becoming more aggressive with water conservation."

In terms of specific policy impact, interviewees mentioned several, and policies passed since its release point to additional instances. As described above, the PIRCA is mentioned front and center in the findings section of the recently passed Hawai'i Climate Change Adaptation Initiative Section 1 (Hawai'i House of Representatives, 2014). The PIRCA has also been used directly in the Hawai'i Water Resource Protection Plan and the related policy process. Interviewees noted:

- "The PIRCA provided additional justification for being more conservative with water allocations."
- "Why should we be studying expensive alternatives when there is no problem now? PIRCA serves as an educational tool to justify what we're doing."

- "We used it as a reference document in submittals to the Commission [CWRM]. ... We used it quite often."

10. Please see Google Forms database submissions.

**Appendix 1:** Select presentations relevant to the Pacific RISA Research **June 1, 2014 to May 31 2015**

<b>Date</b>	<b>Presenter name</b>	<b>Title</b>	<b>Location</b>
August 13, 2014	Victoria Keener	10th Annual Hawai'i Floodplain Manager's Conference, "Planning for the Rising Tide" Hydroclimatological Trends and Climate Impacts and Projections in Hawai'i	Honolulu, Hawai'i
November 14, 2014	Victoria Keener	University of Hawai'i, Manoa Geology and Geophysics Department TGIF Seminar Series	University of Hawai'i-Honolulu, Hawai'i
December 9, 2014	Victoria Keener	Participatory scenario planning for climate change adaptation: the Maui Groundwater Project Maui Conservation Alliance Seminar	Maui, Hawai'i
January, 2015	Melissa Finucane, Victoria Keener, Laura Brewington	Evaluation to Advance Science Policy: Lessons from the RISA Programs	Charleston, North Carolina
Jan 29, 2015	Victoria Keener	Participatory scenario planning for climate change adaptation: the Maui Groundwater Project	Lyon Arboretum, Honolulu Hawai'i.
February 10-12, March 26, May 6	Alan Mair	Estimating climate-change impacts on groundwater recharge for the island of Maui, Hawai'i a. USGS Water Mission Area Studies Chief's Meeting b. USGS Pacific Region Face-to-Face Directors Meeting c. USGS Groundwater Technical Review Team	Honolulu, Hawai'i
Mar 4, 2015	Victoria Keener	CEREO Seminar Series The Pacific RISA: Co-Production of	University of Washington

		Climate Research for Resource Management in Hawai'i and the Pacific Islands	at Pullman
April, 2015	Matthew Widlansky	Preliminary report on project results <i>Climate Projections for Hawai'i and other Pacific Islands: Climate sustainability workshop</i>	University of Guam, Guam
July, 2014	Laura Brewington	Climate Adaptivity of Freshwater Regulations in American Sāmoa	American Sāmoa
April 2015	Victoria Keener	Technical, Impact, and Action Indicators of Climate Change in the Republic of the Marshall Islands	Majuro, Republic of the Marshall Islands

**Appendix 2:** List of officials and stakeholders interviewed consulted as part of the Independent evaluation (Moser, 2015)

<b>Respondent/contacts</b>	<b>Affiliation</b>
Aila, William	Department of Land and Natural Resources
Bavishi, Jainey	Asia Pacific Disaster Risk Reduction and Resilience Network
Choy, Barry	National Oceanographic and Atmospheric Administration, Department of Interior- PACOM
Codiga, Doug	Schlack Ito (Attorney)
Fujii, Neal	Commission of Water Resource Management
Greene, Robbie	Commonwealth of the Northern Marianas, Sea Grant
Kimura, Jeremy	Commission of Water Resource Management
McLane, Sarah	Maui Nui Marine Resource Council
Meyer, Paul	Maui Board Water Supply



Ohye, Lenore	Commission of Water Resource Management
Scheuer, Jonathan	Jonathan Likeke Scheuer Consulting
Starr, Jonathan	Commission of Water Resource Management
Tam, Bill	Commission of Water Resource Management
Usagawa, Barry	Honolulu Board of Water Supply