

The Second Conference on

WATER RESOURCE SUSTAINABILITY ISSUES ON TROPICAL ISLANDS

December 1 - 3 , 2015 | Hilton Hawaiian Village | Honolulu, Hawaii



Opening Remarks and Conference Objectives

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ORGANIZED AND SPONSORED BY

- Water Resources Research Center, University of Hawaii at Manoa
- Water and Environmental Research Institute of the Western Pacific, University of Guam
- Puerto Rico Water Resources and Environmental Research Institute, University of Puerto Rico
- Virgin Islands Water Resources Research Institute, University of the Virgin Islands

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- USGS Pacific Islands Water Science Center, Honolulu, Hawaii
- United States Geological Survey

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- **Tim Bodell**, American Samoa EPA
- **Roger Fujioka**, former Director, WRRC; Professor Emeritus, School of Public Health, UHM
- **Earl Greene**, Chief, Office of External Research, USGS
- **Shahram Khosrowpanah**, Director, Water and Environmental Research Institute of the Western Pacific, University of Guam
- **Darren T. Lerner**, Interim Director, WRRC; Director, Sea Grant College Program, UHM
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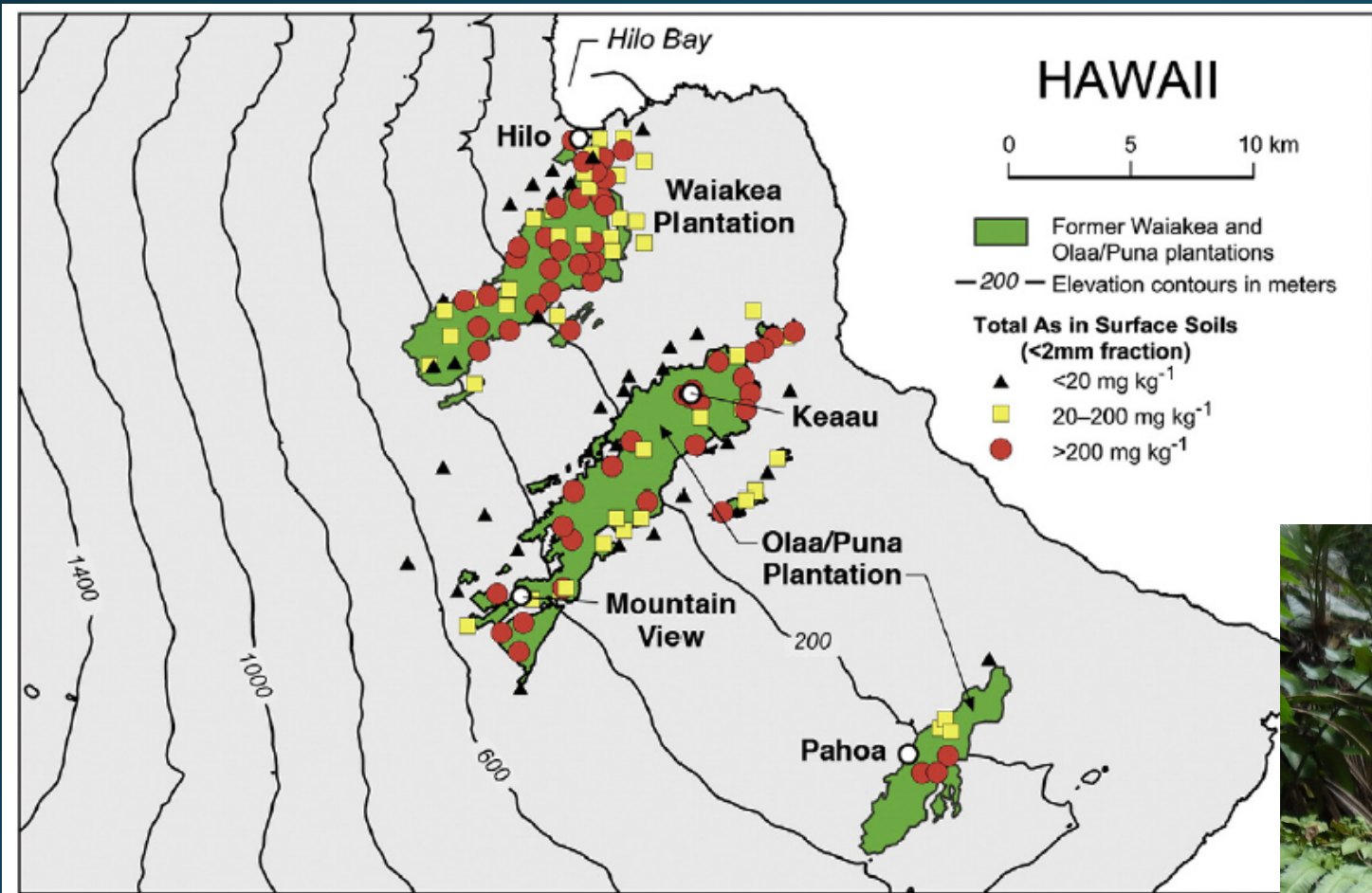
Conference Objectives and Highlights

Critical issues

- Island communities are faced with a unique set of environmental and cultural issues
- Fresh water resources are under threat due to overuse and contamination
- Oceans are ecologically sensitive and valuable and are threatened by pollution
- Sea level rise is degrading groundwater resources
- Communities are heavily dependent on importing essentials, such as food and fuel

- Population growth is putting increasing pressure on water resources
- Sustainable management, and protection of island water supplies is even more critical than it is on the continents, as island communities have no water resources for importation
- Researchers seldom have the opportunity to share knowledge and experience with one another, as they mainly work in isolation

Arsenic soil contamination

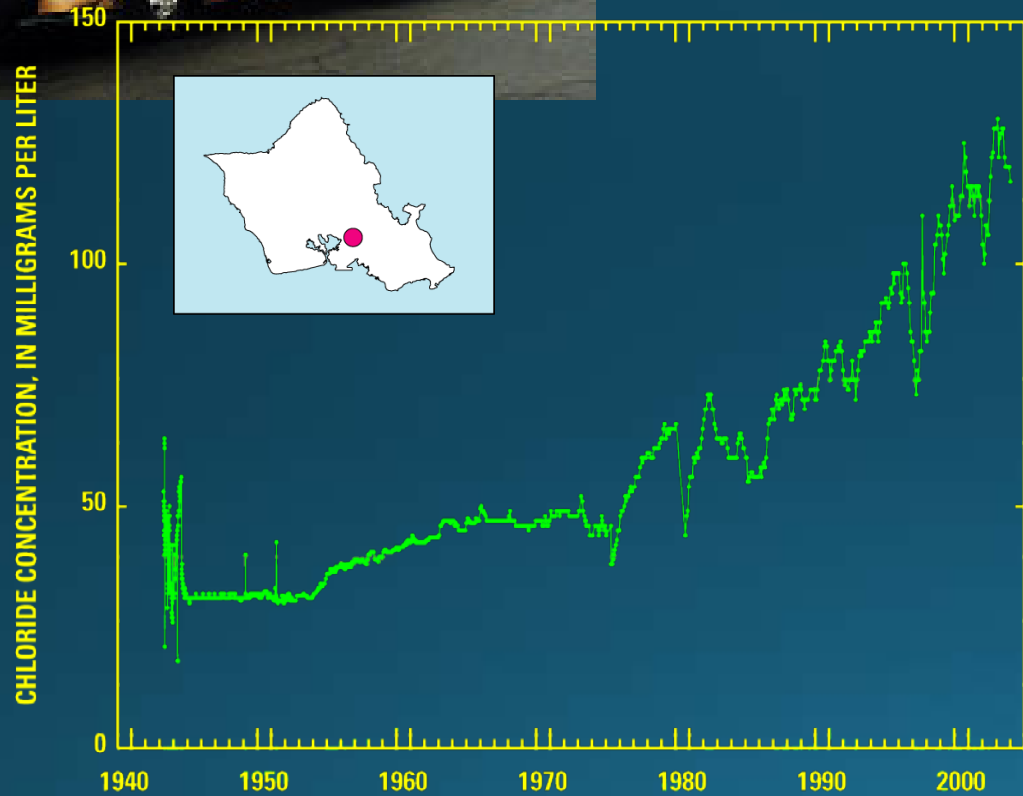


Climate change

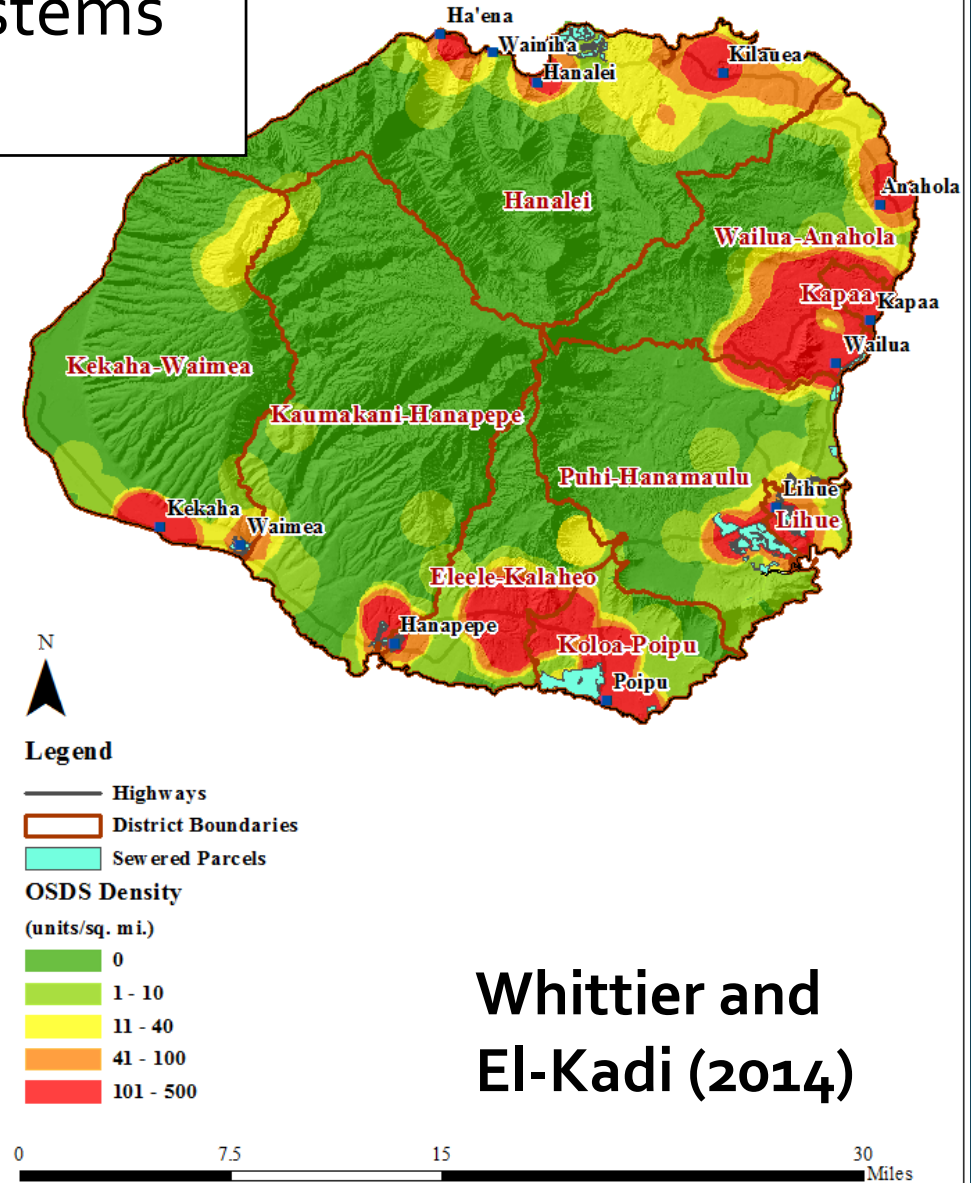


Cutler et al. (2013)

Water - energy nexus



Septic systems density



Halawa Shaft Chlorides: From Oki (2005)

Hawaii

- Oahu is predicted to experience significant population growth requiring more fresh water and energy and need more space for the disposal of wastes.
- Need an alternative to the present practice of releasing wastewater into the ocean after primary treatment.
- Legacy agricultural practices
- Erosion and flooding
- Potential septic system contamination

American Samoa

- Population growth
- Bacterial and nutrient contamination due to septic systems and piggeries (boiling water advisory)
- Saltwater contamination
- Groundwater under the direct influence of surface water
- High elevation water development
- Geothermal energy development

Guam

- Economic expansion associated with the flux of military personnel and their dependents.
- Anticipated expansion and economic growth will require additional water production.
- Land clearance and obsolete land use practices continue to induce erosion in watersheds, which impacts coral reefs in near shore environments.

Puerto Rico

- **Puerto Rico** is rich in surface water bodies, however, water availability and quality are of concern.
- 2012: 593 surface water bodies are impaired.
- High erosion rates and aged water infrastructure.
- Population growth making the island one of the most densely populated (1,100 p/sq. mi.) in the tropics.
- Recent droughts have intensified and have occurred during raining season, which is unusual for Puerto Rico.

U. S. Virgin Islands

- Seawater desalination provides water to the principal water distribution systems where ground and surface water supplies are very limited.
- With rising energy cost, there is renewed interest in water conservation and better management of the rainwater cisterns that are required by law.

Atolls

- Droughts associated with El Nino leads to groundwater overuse and saltwater contamination.
- Atolls are vulnerable to wash over events, especially during times of heightened sea levels and storm passages.
- Wash overs leaves shallow aquifers contaminated with salt water, in addition to physical damage.

Arkansas a refuge from rising seas in Marshall Islands

By Associated Press

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 **Recommend**

47 people recommend this. Be the first of your friends.

This conference is intended to meet the following needs

- Threats to island communities be addressed by sound scientific research before they reach crisis proportions
- Resource protection managers need access to scientifically sound research that is specific to island environments
- Enhanced communication and collaboration between island researchers can provide a vital, synergistic link, which will strengthen all research programs

Technical Sessions

Oral Sessions

- Water resources sustainability
- Water quality
- Climate change and its impacts on water resources
- Water resources exploration
- Protection strategies for water resources
- Managing water demands and supplies
- Coastal groundwater

Poster Session

- Water resources sustainability
- Water quality



The environment appreciates a little attention

Later that day ...

(Warning: picture may be disturbing to some viewers)



Lesson learned: Showing too much appreciation is not good for your health!

SESSION B • Water Resources Exploration — Session Chair: Darren Lerner

- 11:00 – 11:25 **Susan S. Hubbard** (invited), Haruko Wainwright, Anh Phuong Tran, Craig Ulrich, Michael Commer, and Baptiste Dafflon. Next-Generation Geophysical Characterization of Watersheds.
- 11:25 – 11:50 **Donald M. Thomas**, Robert B. Whittier, and Nicole Lautze. Recent Findings of the Humu'ula Groundwater Research Project and Implications for Groundwater Modeling.
- 11:50 – 12:15 **J. Lelemia Irvine** and Oceana P. Francis. Island Sustainability: Rooftop Rainwater Harvesting Study for Moku-o-Lo'e, O'ahu, Hawaiian Islands.
- 12:15 – 13:30 Lunch**

SESSION C • Protection Strategies for Island Watersheds and Aquifers — Session Chair: Jorge Rivera-Santos

- ~~13:15 – 13:40~~ **Chittaranjan Ray** (invited). Understanding the Fate of Chemicals in Tropical Environments Site to Regional Scales.
- 13:30 – 13:55 **Shahram Khosrowpanah**, Mark Lander, Sydonia Manibusan, Bill Whitman, and John Jocson. Watershed Management: Ugum, Piti-Asan, Geus Watershed.
- 13:55 – 14:20 **Scot K. Izuka**. Assessing Groundwater Availability in Hawai'i's Diverse Hydrogeologic Settings.
- ~~14:30 – 14:55~~ **Mohammad H. Golabi** and Sydonia Manibusan. In Situ Monitoring of Watershed Following 'Revegetation' Efforts for Reducing Sedimentation and Improving Water Quality in the Micronesian Island of Rota, CNMI.
- 14:20 – 14:45 **Robert E. Bourke**, Natalie Waters, and Jordan Moniuszko. Kaelepulu: An Investigation of Flow Restoration, Mixing and Exchange in an Urbanized Estuary to Help Define Restoration Alternatives.
- 14:45 – 15:00 Break**

SESSION C • Continued — Session Chair: Jorge Rivera-Santos

- 15:00 – 15:25 **Donald E. Heacock** and Michael H. Kido. Restoring Ecological Integrity in Hawaiian "Mountain-to-Sea" Environments.
- 15:25 – 15:50 **Paul J. Kemp**. Community Management of Water Resources and Delivery.

SESSION D • Water Quality: Application of Technology and Adaptive Management — Session Chair: Roger Fujioka

- 15:50 – 16:15 **Joseph D. Rouse**. Studies of Enhancement of Sewage Treatment and Composting of Sludge on Yap Island.
- 16:15 – 16:40 **Amanda L. Cording** and Stephanie E. Hurley. Adapting Bioretention (Rain Garden) Designs to Maximize Nutrient and Sediment Pollution Removal from Stormwater.

Mahalo, and enjoy the program

Presentations

- **Earl Greene**, Chief, Office of External Research, USGS
- **Shahram Khosrowpanah**, Director, Water and Environmental Research Institute of the Western Pacific, University of Guam
- **Jorge Rivera-Santos**, Director, Puerto Rico Water Resources and Environmental Research Institute
- **Kristin Wilson Grimes**, Director, Virgin Islands Water Resources Research Institute
- **Darren T. Lerner**, Interim Director, WRRC; Director, Sea Grant College Program, UHM