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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- American Samoa Power Authority
- Department of Geology and Geophysics, University of Hawaii at Manoa
- National Institutes for Water Resources
- Sea Grant College Program, University of Hawaii at Manoa
- USGS Pacific Islands Water Science Center, Honolulu, Hawaii
- United States Geological Survey
CONFERENCE ORGANIZING COMMITTEE AND TECHNICAL ADVISORS
• Stephen Anthony, Director, USGS Pacific Islands Water Science Center, Honolulu, Hawaii
• 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
• Utu Abe Malae, Executive Director, American Samoa Power Authority
• Philip Moravcik, WRRC, UHM
• Jorge Rivera-Santos, Director, Puerto Rico Water Resources and Environmental Research Institute
• Walter F. Silva-Araya, Associate Director, Puerto Rico Water Resources and Environmental Research Institute
• Henry Smith, Former Director, Virgin Islands Water Resources Research Institute
• Kristin Wilson Grimes, Director, Virgin Islands Water Resources Research Institute
WRRC Support Staff

• Enjy El-Kadi
• April Kam
• Barbara Guieb
• Kevin Nishimura
• Patricia Hirakawa
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
Climate change

Cutler et al. (2013)
Halawa Shaft Chlorides: From Oki (2005)

Septic systems density

Water - energy nexus

Whittier and El-Kadi (2014)
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
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

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker and Affiliation</th>
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<tbody>
<tr>
<td>11:00 – 11:25</td>
<td>Susan S. Hubbard (invited), Haruko Wainwright, Anh Phuong Tran, Craig Ulrich, Michael Commer, and Baptiste Dafflon. Next-Generation Geophysical Characterization of Watersheds.</td>
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<tr>
<td>12:15 – 13:30</td>
<td>Lunch</td>
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### SESSION C: Protection Strategies for Island Watersheds and Aquifers — Session Chair: Jorge Rivera-Santos

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>13:45 – 14:00</td>
<td>Chittaranjan Ray (invited). Understanding the Fate of Chemicals in Tropical Environments Site to Regional Scales.</td>
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<tr>
<td>14:00 – 14:30</td>
<td>Shahram Khosrowpanah, Mark Lander, Sydonia Manibusan, Bill Whitman, and John Jocson. Watershed Management: Ugum, Piti-Asan, Geus Watershed.</td>
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<tr>
<td>15:00 – 15:30</td>
<td>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.</td>
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<tr>
<td>16:00 – 16:30</td>
<td>Break</td>
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### SESSION C Continued: Session Chair: Jorge Rivera-Santos

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<tr>
<td>15:00 – 15:25</td>
<td>Donald E. Heacock and Michael H. Kidder. Restoring Ecological Integrity in Hawaiian “Mountain-to-Sea” Environments.</td>
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### SESSION D: Water Quality: Application of Technology and Adaptive Management — Session Chair: Roger Fujioka

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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