Water Research in the Pacific

Gary R.W. Denton, Ph.D.

Water and Environmental Research Institute of the Western Pacific

University of Guam

Water & Environmental Research Institute of the Western Pacific

UNIVERSITY OF GUAM

UNIBETSEDÅT GUAHAN

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Water & Environmental Research Institute of the Western Pacific

Mission Statement

To seek solutions through research, teaching and outreach programs, to issues and problems associated with the location, production, distribution and management of freshwater resources

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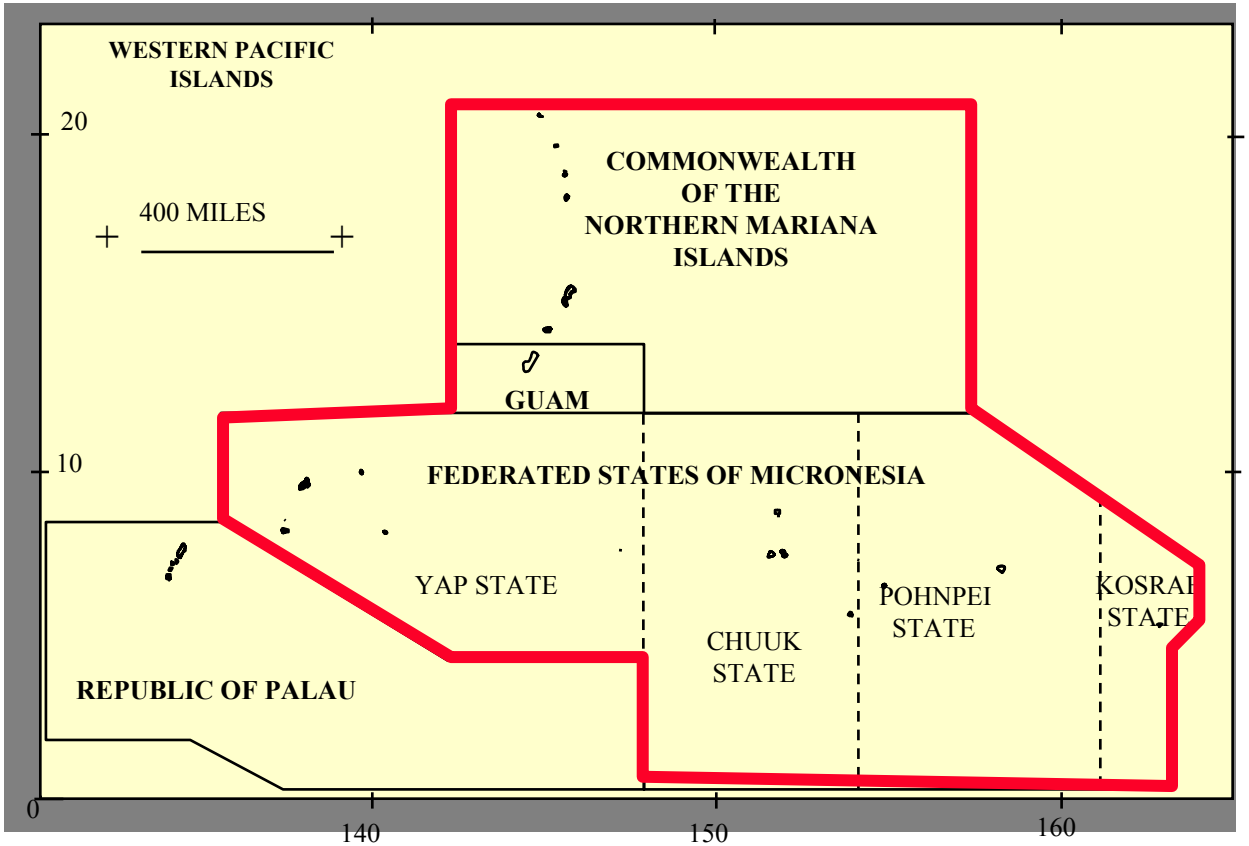

Distance ~ 2000 miles (Kosrae – Yap)
Total land mass area ~580 sq. miles
Population 330,000

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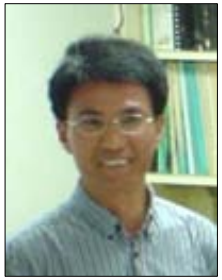
Faculty and Major Research Areas

- Gary Denton: Environmental Toxicology
- Charles Luo: Surface Water Hydrology
- John Jenson: Groundwater Hydrogeology
- Shahram Khosrowpanah: Hydraulics
- Mark Lander: Tropical Climatology
- Yuming Wen: GIS Specialist



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Dr. Gary Denton
Environmental Toxicologist

Dr. John Jenson
Groundwater Hydrologist

Dr. Shahram Khosrowpanah
Civil Engineer

Dr. Mark Lander
Tropical Climatologist

Dr. Charles Luo
Surfacewater Hydrologist

Dr. Yuming Wen
GIS Specialist

Research Programs

- Rooftop Rain Catchment Sizing
- Aquatic Pollution Monitoring & Assessment
- Groundwater and Surfacewater Modeling
- Climate History
- Soil Erosion Monitoring and Mitigation
- Guam Hydrologic Survey
- ENSO Applications Center
- GIS Assessment of Land Cover Changes
- Atoll Hydrologic Modeling
- Guam Comprehensive Monitoring Program
- Watershed Management
- Glacial Till Modeling

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Research priorities determined by Advisory Councils that meet annually to discuss critical water resources issues and problems encountered in each regional entity

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General Research Areas
• Mapping
• Modeling
• Monitoring
• Management
• Maintenance

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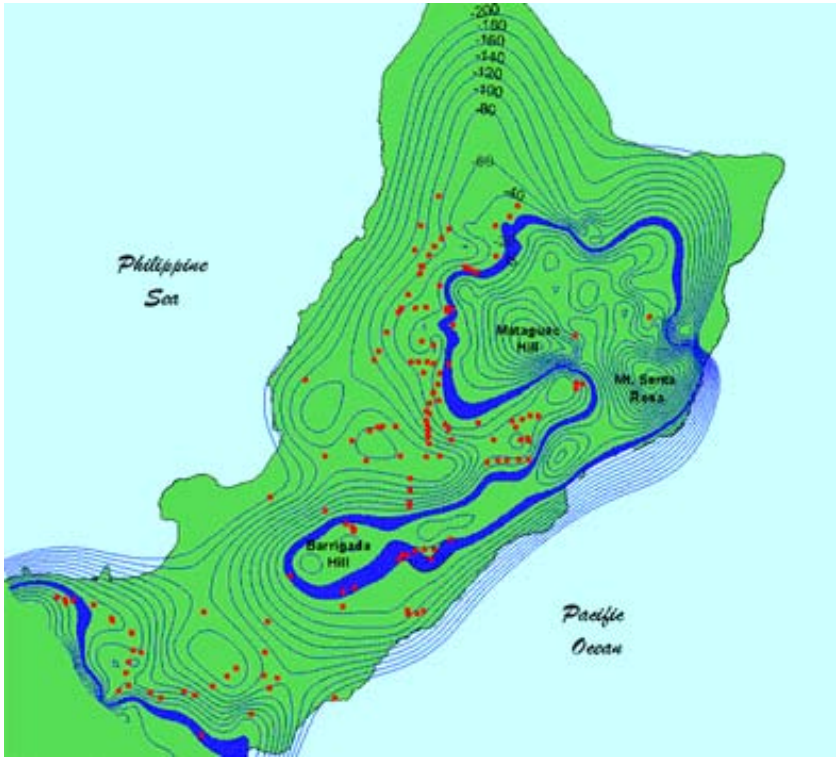
Research Highlights



Mapping basement volcanics for optimization of drinking water well locations

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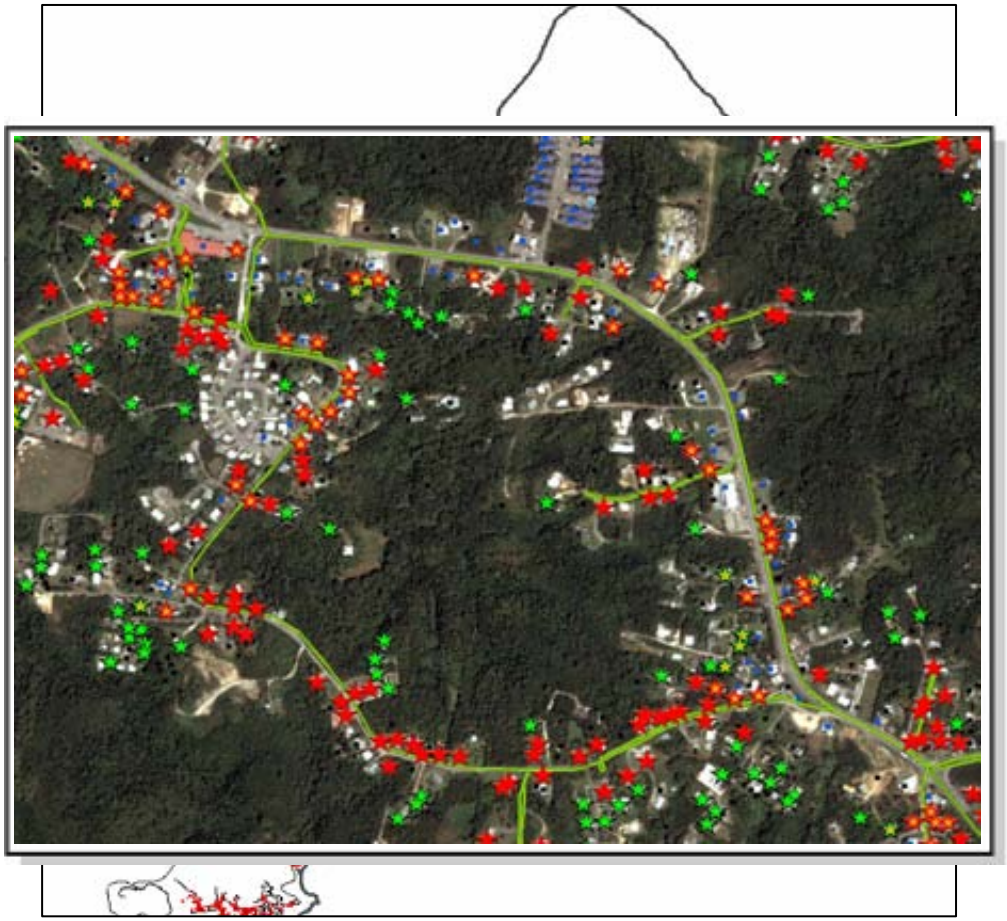
Research Highlights



Mapping septic and other waste water systems above Guam's northern lens aquifer

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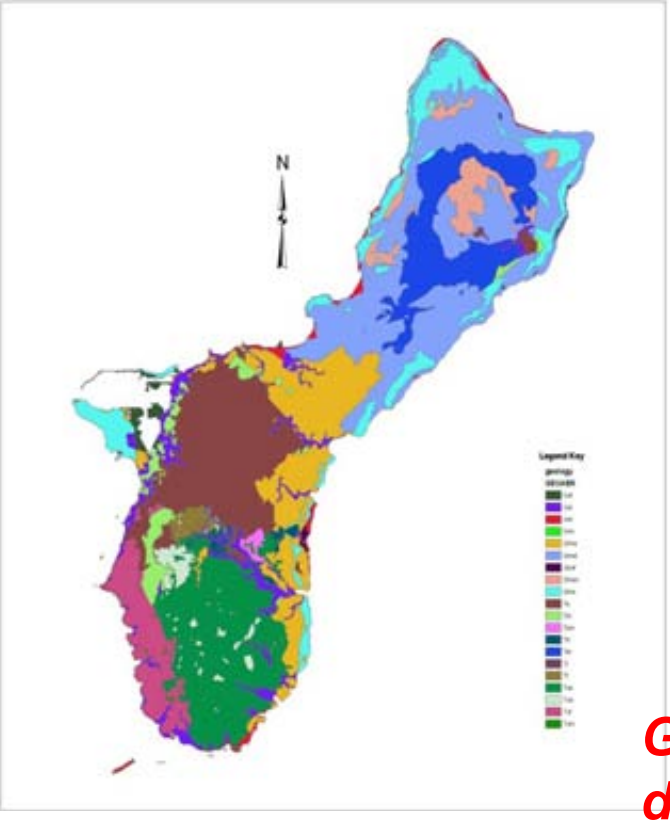
Research Highlights



Guam Geologic map updated to show new data and advances in data interpretation

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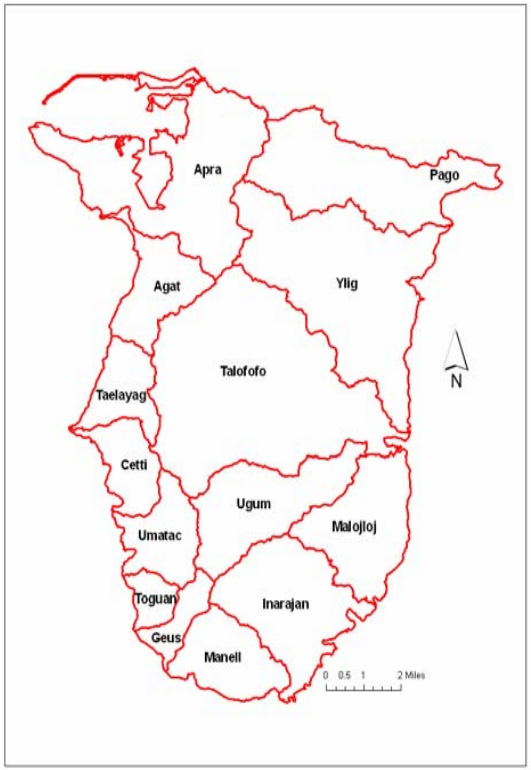
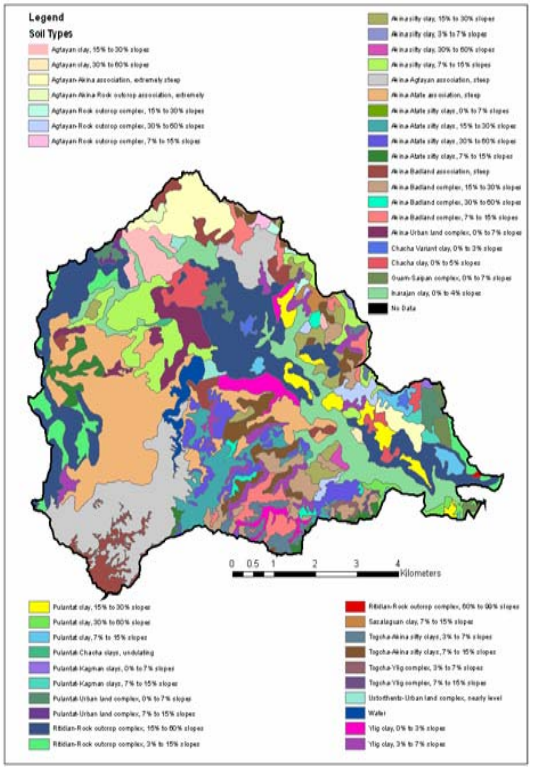
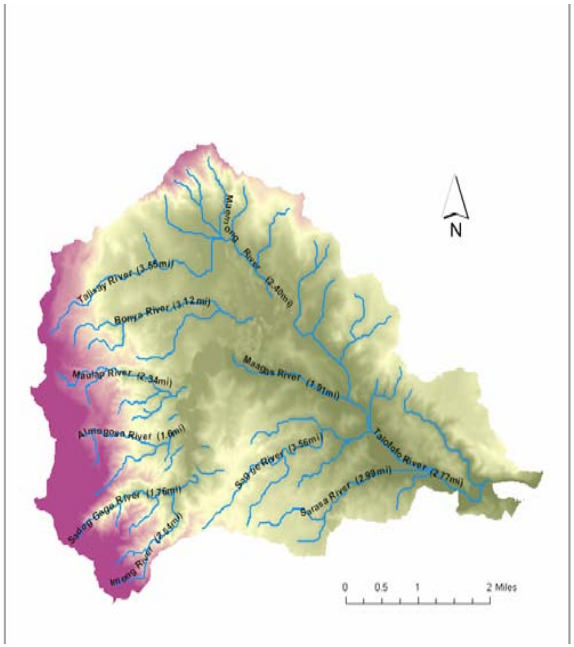
Research Highlights







Development of Guam Watershed Atlas using GIS

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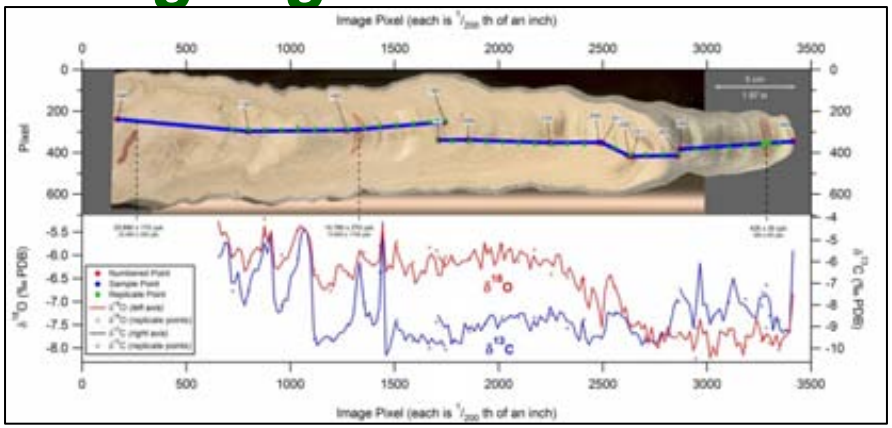
Research Highlights



Stalagmite from local cave provides insight into climate history of Guam (sea level rise, surface temps, El Niño cycles).

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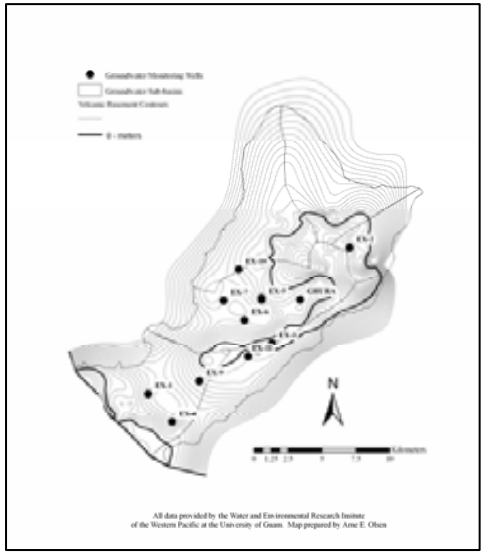
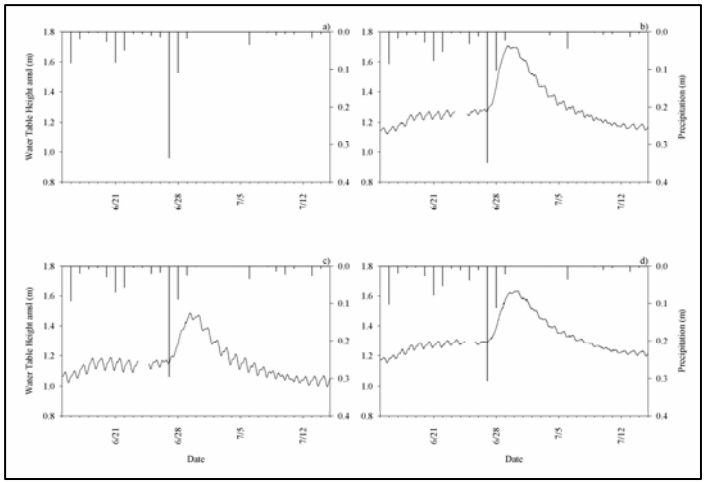
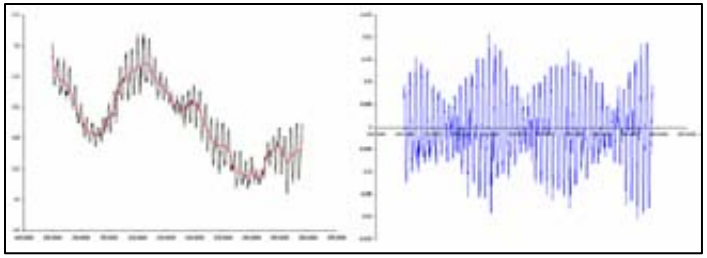
Research Highlights







Modeling the Northern Guam Lens Aquifer to determine maximum sustainable yield and precipitation response times of the water table

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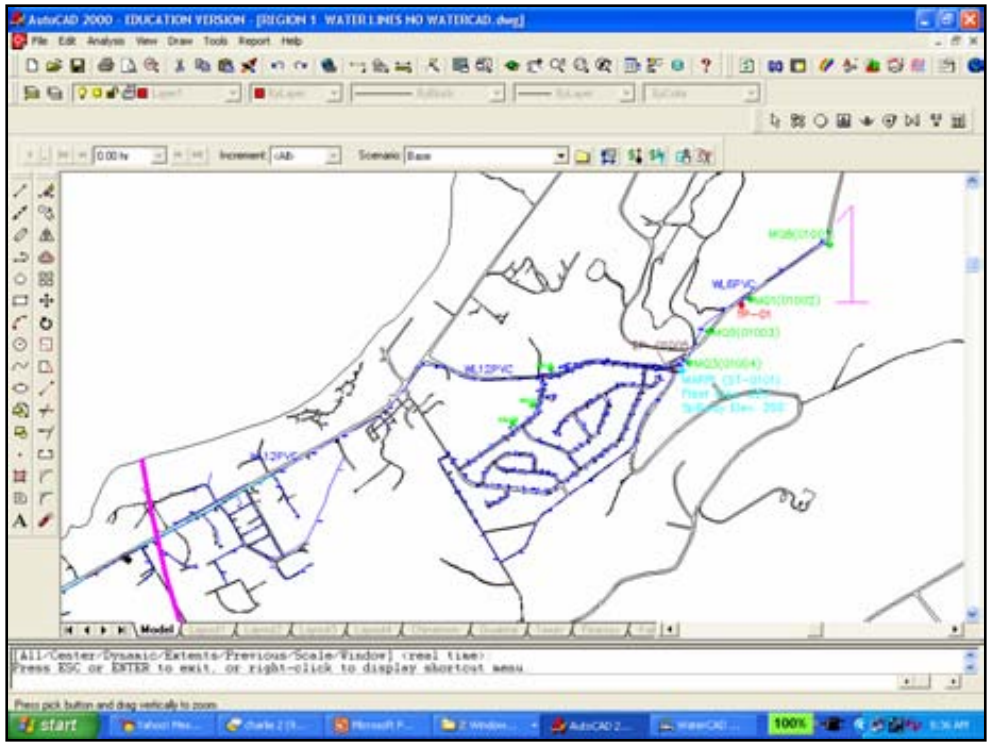
Research Highlights



WaterCAD hydraulic model of the Marpi area water distribution system in Northern Saipan and field varification of hydraulic model data at fire hydrant

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Research Highlights

Water resource assessment, management, modeling and training on atoll islands

drought preparedness

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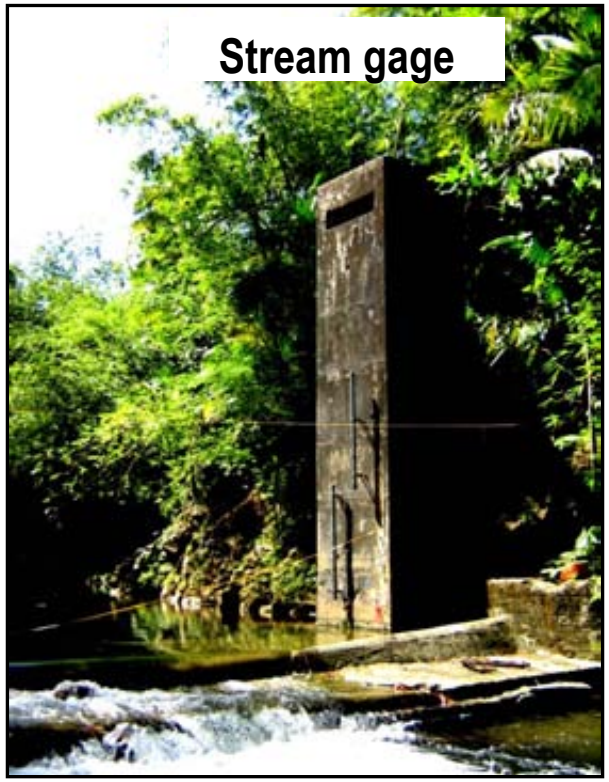
Research Highlights



Sediment sampler

Water level & salinity monitoring equipment

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Quantitative and qualitative monitoring of Guam's surface and groundwater resources

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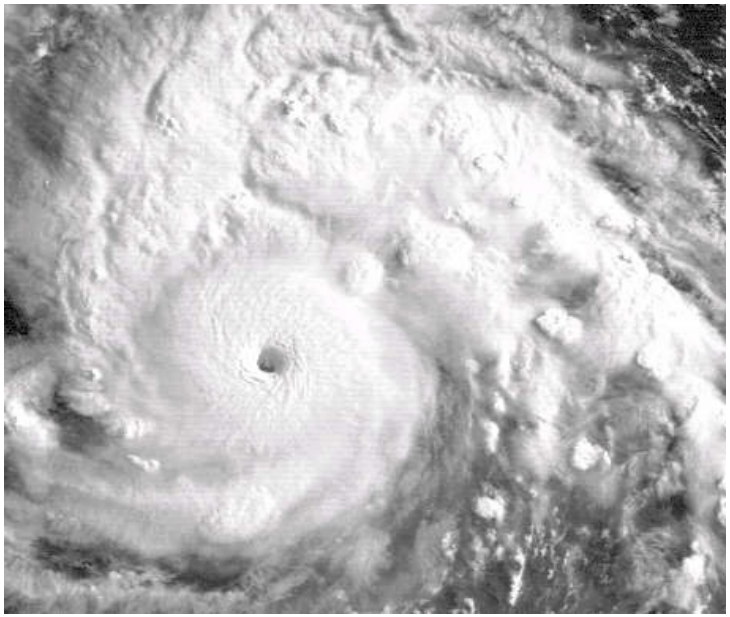
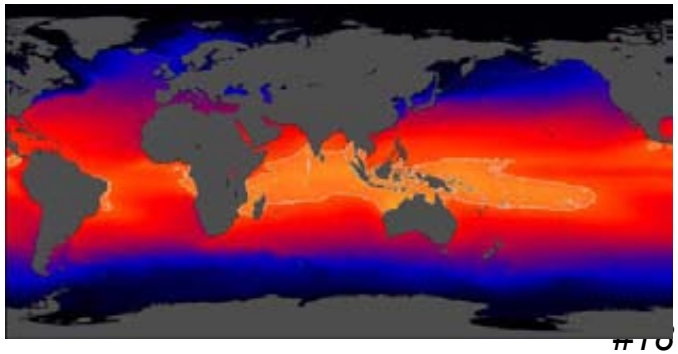
Research Highlights



Typhoon damage assessment, impact of global warming on sea level rise, El Niño events and climate history of Western Pacific



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Research Highlights

Determining the impact of aqueous contaminants released from Ordot Dump on fisheries resources in Lonfit-Pago River System and Pago Bay

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Research Highlights

Contaminant assessment of Saipan Lagoon and impact of Puerto Rico Dump and other potential sources of pollution on fisheries resources in the area

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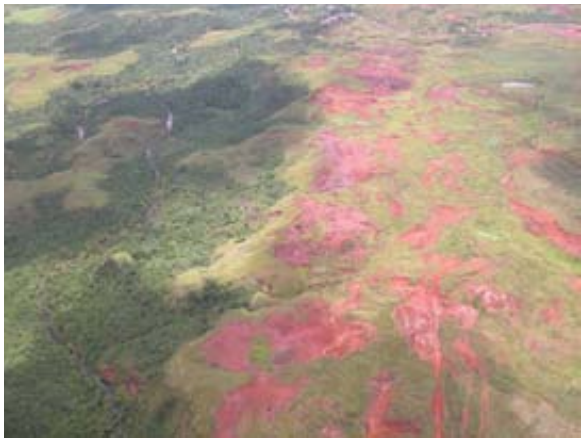
Research Highlights



Watershed management and restoration, With emphasis on soil erosion mitigation strategies for protection and preservation of coastal water communities

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Research Highlights

Impact of clearing native forest to grow sakau (kava) on soil erosion in Pohnpei watersheds

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Educating Tomorrow's Community Leaders

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Staff Support

- Gwen Manglona: Administrative Assistant
- Norma Blas: Secretary Typist I
- H. Rick Wood: Water Quality Lab Manager
- Crispina Tagudin: Laboratory Technician
- John Jocson: Staff Hydrologist

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INTRODUCTION TO RESEARCH ACTIVITIES & TEACHING PROGRAMS

by

Gary R.W. Denton Ph.D.
Director

WERI

WATER AND ENVIRONMENTAL RESEARCH INSTITUTE
OF THE WESTERN PACIFIC
UNIVERSITY OF GUAM

February 2007

OUTREACH

FACULTY OUTREACH ACTIVITIES

WERI's information dissemination and outreach activities are carr out in a variety of ways ranging from the production of pamphlets, brochures and technical reports, to short courses, technical trainin workshops and associated field activities. WERI also feature its research activities and Technical Reports (in downloadable pdf fo on its website at http://www.weriguam.org.

WATER SYSTEM MAINENANCE & REPAIR WORKSHOPS

Conducted annually and alternating between Yap and Pohnpei in FSM and Saipan in the CNMI, this one-week course reviews the operation, overhaul and preventative maintenance of pumps and automatic valves in a classroom setting with hands-on experience Participants in the course are mostly employees of the Pohnpei U Corporation and Yap State Public Service Corporation, and the Commonwealth Utilities Corporation of Saipan.

CLOSED CONDUIT HYDRAULICS & WATER SYSTEM MODELI

Designed to improve the modeling expertise of engineering staff at and Guam Environmental Protection Agency (GEPA), this short co consists of 60 hours intensive training in fluid mechanics, water distribution system hydraulics, and the operation of the Haestad wa distribution system model "WaterCAD for AutoCAD". Participants r both classroom training in the theoretical aspects of water system hydraulics and modeling and hands-on laboratory experience input data and running the Haestad model.

GROUNDWATER MANAGEMENT AND TRAINING

Yap Council of Chief listens to Mr. Ryan Bailey (WERI graduate stu explain groundwater management strategies for low island atolls in FSM.

TEACHING

FACULTY TEACHING ACTIVITIES

WERI faculty play an integral role in the Environmental Science MS Program, collectively teaching ~50% of the available courses, advising between 6-10 students at any one time, and producing a little over 60% of graduating students to date. The undergraduate Pre-Engineering Program also falls under the preview of WERI.

GRADUATE EPLOYMENT STATUS

WERI graduates emerging from the Environmental Science MS Program generally find employment in environmental and related fields in industry, government and education. Approximately 15% go on to pursue higher degrees and ~30% find employment locally.

WERI GRADUATES

LH Picture: Alex Soto (left) and Tom Nadau (right) graduated from the Environmental Science MS Program in 2001. Alex, who was employed by Guam EPA at the time, later served as the agency's Chief Administrator before being appointed Environmental Compliance Superintendent with a Guam-based US Navy contractor. Tom continued working at Guam Department of Public Health and is now the Departmental Administrator for the Division of Environmental Health.
RH Picture: Ryan Bailey graduated from the program in 2007 and is currently pursuing a Ph.D. in Civil Engineering (Hydrology) at Colorado State University and focusing on desert irrigation. Among several other rising stars are:-

Nelle Hoffman (2007) Environmental Scientist, Seminole Nation, FL.

Michael Park (2007) Environmental Scientist Duenas & Assoc. Guam

Rob MacCracken (2006) Hydrologist, Aqua Terra Ltd. Western Australia.

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WATER AND ENVIRONMENTAL RESEARCH INSTITUTE OF THE WESTERN PACIFIC · UNIVERSITY OF GUAM

MESSAGE | FACULTY | STAFF | PROGRAMS | USGS PROJECTS | LATEST NEWS | LABS | REPORTS | RESEARCH OPPS

WELCOME

You have entered the website of the Water and Environmental Research Institute of the Western Pacific (WERI), at the University of Guam. We are currently six faculty and five staff strong and our mission is to seek solutions through research, teaching and outreach programs, to issues and problems associated with the location, production, distribution and management of freshwater resources in Guam, the CNMI and the FSM

MESSAGE FROM WERI DIRECTOR, DR. GARY DENTON

Hello and welcome to the website of the Water and Environmental Research Institute of the Western Pacific, otherwise known as WERI. This recently updated version of our website provides you with a brief overview of the Institutes evolution and regional mission, and introduces you to the faculty and staff. It gives you a glimpse of our faculty research interests and the research programs they oversee. It also provides you with summaries of their recently completed research projects as well as those currently underway. Our research priorities are determined largely by local needs and are identified by stakeholders represented at our annual advisory council meetings. As a consequence, basic and applied research projects that focus on local water quantity and water quality problems are the order of the day. We are fortunate in having experienced, well rounded faculty with collective expertise in all major fields pertinent to the management, distribution and protection of water resources in the tropical Pacific region.

The current website has updated WERI's technical report listings. These reports are in pdf format for direct viewing and retrieval at your leisure. One may search the technical report data base by title, year, author and keyword in order to retrieve the report or reports that are of greatest interest to you. If, for any reason, you are unable to view a report, or have comments or suggestions for improvement to the website in general, please feel free to contact me at gdenton@uog.edu.

Those of you who are familiar with this website will recognize that there has been a recent change in the WERI Directorship. My predecessor, Dr. Leroy Heitz, passed that baton on to me in October of last year after serving as the Institute's Director for six years. Leroy was an outstanding leader who brought cohesiveness and stability to WERI and did much to shape the Institute into the premier water resources research center that it is today. Sadly, he will be leaving us towards the end of the year and retiring with his wife, Joe, to their home in Arizona. We wish them well and hope to see them back here from time to time. Meanwhile, I will try to emulate Leroy's leadership as best I can until the baton is passed on once again.

On behalf of the Institute, I would like to thank Gary Sung, creative director of Ideal Advertising for his inspiring redesign and upgrade of the previous website to its current format. We would also like to thank the Department of Interior, U.S. Geological Survey, for funding this web renovation project through the Water Research Institute (WRRI) Program. Congresswoman Madeleine Z. Bordallo deserves special mentio supporting the 2007 reauthorization of the WRRI Act and for her continued interest in the WRRI pr WERI. Finally, we are indebted to the University of Guam and the people of Guam, the CNMI and th their unfailing support of the water research programs at WERI.

LATEST NEWS

This is the latest news quick launcher.

- National Water Institutes Program Grants approved

CURRENT PROGRAMS

- GIS PROGRAM
- POLLUTION MONITORING AND ASSESSMENT PROGRAM
- SOIL EROSION MONITORING AND MITIGATION PROGRAM
- WATERSHED MANAGEMENT PROGRAM
- ENSO APPLICATIONS CENTER
- WETLANDS PROGRAM
- ROOFTOP RAIN CATCHMENT
- GROUNDWATER RESEARCH
- ATOLL HYRDOLOGIC MODELING

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Internet