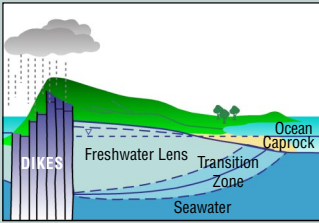




Hawaii Water Resources Research Center

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Hydrogeological features of a typical Hawaii basal aquifer



Collecting samples from membrane bioreactor, Oahu, Hawaii



Sampling at Sandy Beach, Oahu, Hawaii



Evaluating the riverbank filtration potential along the Ganges River, Varanasi, India



Checking the water salinity at Kewalo Basin, Oahu, Hawaii

WHO AND WHAT WE ARE

WRRC is one of 54 sister institutes created under the Water Resources Research Act of 1964. The Center is charged with bringing together faculty from diverse fields of study, mostly at the state's only research-oriented university campus, to encourage research in the multiple disciplines necessarily concerned with water issues. Concomitant tasks are transferring research results, and educating the future workforce through employing students to work on projects.

Most WRRC faculty members hold joint appointments with departments of engineering, geohydrology, microbiology, botany, economics and other disciplines. Several other faculty members serve as principal investigators. Each year, WRRC receives a small federal grant with which to leverage University funds and external grants. In FY2007, WRRC projects employed 14 undergraduate, 15 master's degree and 11 Ph.D. students. Facilities include well-equipped Environmental Chemistry and Microbiology laboratories, as well as administrative offices and a library/conference room.

2007 RESEARCH ACCOMPLISHMENTS

- Professor Clark Liu extended John Mink's groundwater hydrology model by incorporating a transition zone between freshwater and seawater. Called RAM2, Liu's model and associated parameter identification techniques are used by the Hawaii Commission on Water Resource Management in setting sustainable yield for Hawaii basal aquifers. The limits on pumping will be included in the forthcoming Hawaii Water Resources Protection Plan.
- Membrane bioreactors (MBRs) hold great promise as a wastewater treatment process, despite problems with clogging. Professor Roger Babcock is developing genetic fingerprinting methods to identify organisms that tend to clog the membranes. Results will enhance membrane cleaning processes and promote MBR system efficiency.
- Economists, botanists and engineers cooperated to study the degree to which Hawaii can tap groundwater streams flowing directly into the ocean, without unduly disturbing nearshore aquatic populations that

thrive in the mixed fresh and saline ocean waters.

- Faculty experts in polychaete, mollusk, crustacean organisms as well as larger fish continue to monitor the health of benthic fauna and other marine communities in the vicinity of City wastewater effluent disposal sites. Large pipes convey treated effluent several thousand feet offshore, releasing it at depths of several hundred feet. Results of more than twenty years' monitoring indicate that a "balanced indigenous population" continues to thrive despite the effluent.
- Ultraviolet light has been used successfully to ensure the purity of freshwater sources. WRRC researcher Dr. Victor Moreland has examined UV processes for disinfection of partially-treated sewage effluent, thus allowing for reuse of the water.
- Dr. Chittaranjan Ray leads an international team in designing riverbank filtration systems to decontaminate water as it seeps to wells from a watercourse. This simple and inexpensive water treatment method will be especially useful in less developed regions of the world.
- Dr. James Roumasset and graduate students have developed water pricing structures to achieve the win-win goals of inducing conservation while at the same time deflecting public opposition to water rate increases. Their models will prove useful in long-range water planning.
- For an island state with near-total reliance on groundwater, wave action can have a significant effect on aquifer storage and yield. Dr. Aly El-Kadi is constructing computer models to examine this interaction.

WRRC Faculty

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Engineering

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