



Applying knowledge to improve water quality
**Southwest States
 & Pacific Islands**
Regional Water Program
 A Partnership of USDA CSREES
 & Land Grant Colleges and Universities

Highlighting efforts around the region

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With efforts focused on

- ↪ Animal Manure Management;
- ↪ Drinking Water and Human Health;
- ↪ Water Conservation and Agricultural Water Management; and
- ↪ Watershed Management,

the Southwest States and Pacific Islands Regional Water Program worked this past year to educate farmers, civic leaders, and the general community on various aspects of water resources and water quality. Pig farmers continuing to learn to adapt their practices to a dry litter system that eliminates discharges of pig waste into nearby waterbodies; community leaders learning how to test, treat, and maintain rainwater catchment systems to ensure clean and safe drinking water - and how to train others to do the same; researchers developing tools to assist in the safe use of reclaimed wastewater and aquaculture effluent for irrigation; and regulatory agency personnel and other stakeholders learning that they can now access data on Hawaii's 319 grant projects are just a few of the many projects and programs supported throughout the region in 2006.

Animal Manure Management

Keep it dry!!

In an ongoing effort to keep accumulated wastes from being washed out into streams or leaching into groundwater, extension agents across the Pacific are promoting dry litter waste management systems for swine operations.

With a successful dry litter demonstration site on Tinian, plans are now in place to establish additional sites in Saipan and Palau.

Beyond the constructed dry litter system, a portable pen system (PPS) is also being promoted. The PPS is a variation of the dry litter system using small portable pens filled with composting materials. Benefits of the PPS include:

- ↪ Low cost and flexibility of operation
- ↪ Elimination of need to flush/spray out waste
- ↪ Can utilize crop residues and yard waste for carbon source
- ↪ Production of compost
- ↪ Ideal for small piggeries

PPS demonstration sites are planned for several islands in FSM and Marshall Islands.

Other expansions of the dry litter system put into motion during 2006 include:

- ↪ Adapting dry litter waste management options for poultry operations
- ↪ Introducing an added value program to promote composting and marketing of organic waste
- ↪ A 2nd Piggery Bliss video with ideas on how to implement the dry litter system, including renovating an existing piggery and composting procedures.



Pigs in a dry litter pen.

Drinking Water and Human Health

Maintain those rainwater catchments!!

Do you treat your rainwater catchment system? If so, how often? These questions and several others were asked of homeowners in Palau this year. Responses varied widely:

- ↪ "No, not since my husband died two years ago"
- ↪ "Yes, two times a month"

Methods of treating the water included nothing at all, a cloth tied to the faucet to act as a filter, boiling the water, and adding chlorine to the tank.

Of 10 homeowners given free home test kits (and instructions on how to use them), 7 reported their results:

- ↪ 5 positive (contaminated with fecal bacteria indicators)
- ↪ 2 negative (no indication of fecal contamination)

This survey was conducted in conjunction with a series of "Train-the-Trainer" workshops held in Palau, the Federated States of Micronesia, and the Marshall Islands to address proper operation and maintenance of rainwater catchment systems.

Based on post-workshop surveys, attendees who help people use and maintain their rainwater catchment systems found the information in the workshops very useful, and will incorporate the information into their community training schedules.

Photos from the workshops and of rainwater catchments around the islands can be found online at: http://www.ctahr.hawaii.edu/rwq/westernpacific/events_page.htm



Apartment building in Palau with two rainwater catchments.

Also ongoing this year, has been research into detecting *Leptospira* in water supplies. Please see the poster "Detecting *Leptospira* in Water" for more information on this project.

Water Conservation and Agricultural Water Management

Reuse that water!!

Wastewater reclamation and reuse have become essential components of water resource management plans throughout the world. In many arid and drought-prone regions, using reclaimed wastewater for irrigation of landscapes and field crops helps to maximize the beneficial uses of available resources. Despite its long use, there are concerns with this practice; to address these concerns issue, the Region 9 water program is supporting work on three projects:

- ↪ Development of a technical bulletin for the safe use of reclaimed water;
- ↪ Development of a user-friendly model to simulate the movement of water, salt, nitrogen, and toxic elements in soils (see poster "An Integrated Model for Evaluating the Effects of Reclaimed Water Irrigation"); and
- ↪ Establishment of demonstration sites for aquaculture effluent use in irrigation (see poster "Use of Aquaculture Effluent to Relieve Water Shortage and Reduce Fertilizer Use in Guam")



Reclaimed wastewater is being used to irrigate this field in Palmdale, CA.

Concerns over irrigation with reclaimed water include:

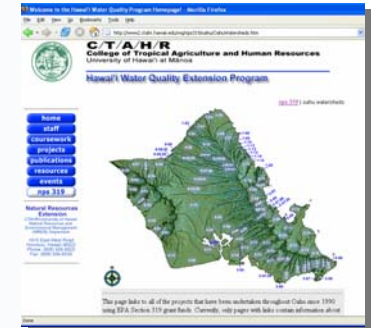
- ↪ salinity and sodium buildup in the soil
- ↪ nitrate leaching
- ↪ fate and transport of pathogens, endocrine disruptors, and pharmaceutically-active compounds

Work on the bulletin, and addressing those concerns led to another regionally-supported project to study the *fate and transport of disinfection byproducts and pharmaceutical/ personal care products of turf-grass irrigated with reclaimed wastewater*. This project is currently underway and is expected to have preliminary results near the end of 2007.

Watershed Management

Save that non-point source pollution data!!

With that rallying cry from the University of Hawaii Water Quality Extension Program, a new website was formed and boxes upon boxes of important information regarding 319 non-point source pollution projects was digitized and made easily accessible for the public.



Site details:

- ↪ GIS maps outlining the watersheds of each Hawaiian island
- ↪ 84 watershed web pages with corresponding summary reports on the 319 project funded in that watershed.
- ↪ presented at the Hawaii Water Quality Conference, August 2006
- ↪ located at <http://www2.ctahr.hawaii.edu/wq/nps319/nonpointsource.htm>

The site has received a great deal of interest from EPA, the Hawaii State Department of Health - Clean Water Branch, the Hawaii Association of Conservation Districts, NRCS, and other stakeholders within the state and region.