



# Water Resources Research Center (WRRC):

Science serving Hawai'i's water resource needs for over 50 years.

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Water Resources Outreach Specialist

University of Hawai'i Water Resources Research Center/ Hawai'i Sea Grant College Program



## Presentation objectives

1. Review UH WRRC mission and uniqueness
2. Highlight new faculty, current research, programs and outreach methods
3. Discuss goals of WRRC and the new outreach position
4. Highlight early projects, partnerships, example of success
5. Inform stakeholders and build bridges across many sectors of the water resource community



**Promote understanding of critical state and regional water resource management and policy issues through research, community outreach, and public education.**







WRRC can be flexible in addressing emerging problems, adaptable to local cultures, institutions of governance, and regional socio-economic and physical conditions, than government agencies.



9 Core Faculty Members

Ongoing Research  
Projects 16

7 Transboundary  
Disciplines



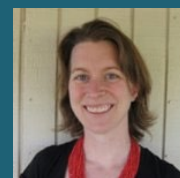
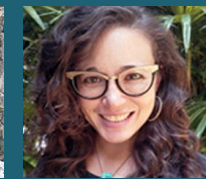
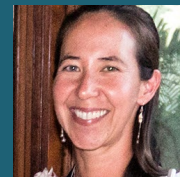
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# Core Faculty



# 15 Affiliate Faculty





VOICE

of the

SEA

40TH ANNUAL

**BRONZE**

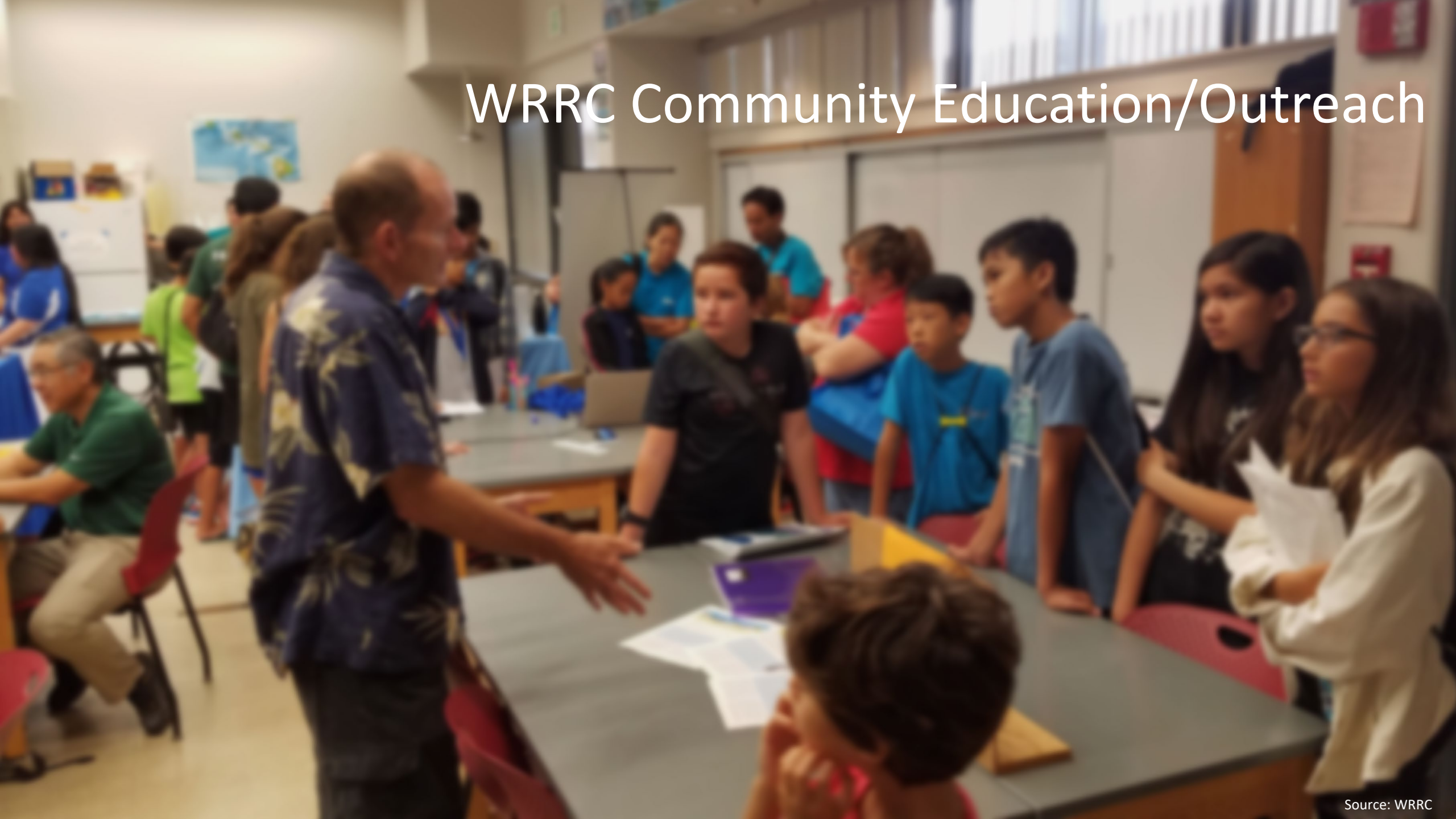
WINNER

The Telly Awards





# WRRC Community Education/Outreach







WRRC  
Lecture Series  
provides a  
forum to  
increase  
awareness of  
water issues  
pertaining to  
island  
hydrology















**Co-Produce  
?'s For  
Study**



Source: Ryerson University



Source: Ke Ola Magazine

**Science & Other Systems of  
Local Knowledge**



**Community  
Needs/Issues**



**Outreach**



Source: espacial

**Translation and  
Dissemination of  
Information/Data**



















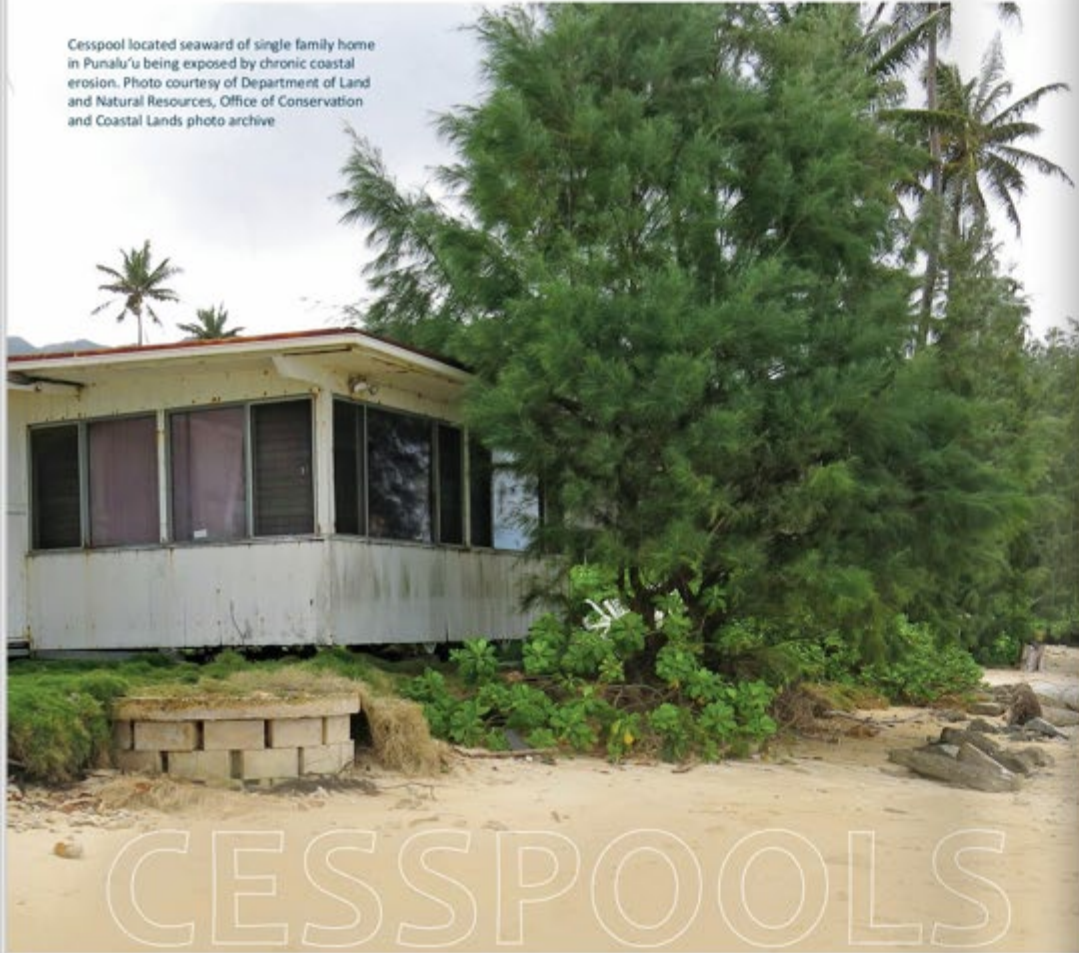
Collaboration with BWS to streamline well sampling efforts with UH while ensuring protocols and procedures are followed.



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Cesspool located seaward of single family home in Punalu'u being exposed by chronic coastal erosion. Photo courtesy of Department of Land and Natural Resources, Office of Conservation and Coastal Lands photo archive



# CESSPOOLS IN PARADISE

by HELEN RAINE

**WE TAKE THE HUMBLE TOILET FOR GRANTED, RARELY** stopping to think about where all that waste goes. But in Hawai'i, the reality for thousands of residents is that the plumbing leads straight to a big hole in the ground. There are approximately 88,000 aging cesspools across the state, and some of that untreated waste is making its way into our streams, oceans, and drinking water, leading to illness for swimmers, paddlers, and surfers, as well as stressing our coral reefs and native fauna. Change is on the horizon, however; some innovative new solutions have reached the testing stage and Hawai'i, "the Aloha State," could be at the frontier of a toilet revolution.

### Dirty Secret

Cesspools are normally associated with poor countries where efficient sewage disposal is simply too costly to implement. Yet here we are in Hawai'i, with 53 million gallons of human waste pouring untreated into the ground annually, according to the Hawai'i State Department of Health (DOH). The state faces genuine challenges with waste water management, including a high number of rural communities who cannot connect to sewer lines and local geology or a shallow water table which makes traditional upgrade options (such as septic systems) less effective. That means that around half of our cesspools pose a risk to water resources. Heavy rain can exacerbate the situation, with flood waters carrying raw sewage into waterways.

The untreated cesspool sewage can introduce pathogens into the ocean and water table, including Hepatitis A, salmonellosis, gastroenteritis, conjunctivitis, and cholera. The effluent also contains nutrients, like nitrogen and phosphorous, that damage the ecosystem, especially coral reefs. For a state that attracts tourists to the islands for its unique natural beauty, and for recreational activities such as snorkeling and swimming, that is a big problem. But it's the locals who really suffer year-round from contaminated water for fishing, recreation, and potentially, drinking.

The problem is likely to become worse as climate change causes flooding events to be more frequent, which could lead to overflowing cesspools. The residents of Kaua'i discovered this first-hand during the catastrophic floods in April of 2018 when

cesspools overflowed, and medical teams had to be deployed after the influx of dirty water.

The legislature and DOH acknowledge the potential problems that cesspools cause and have been actively searching for solutions. One of the biggest stumbling blocks is financial. A cesspool requires little maintenance. Putting in a septic system or advanced treatment unit (ATU), on the other hand, is expensive and requires regular check-ups and pumping to keep it working. Change is needed, and it is coming, but so far, it is not cheap.

### Turning the Sewage Tide

Regulation on sewage management has failed to keep up with population growth in Hawai'i. Large capacity cesspools were banned in certain areas in 1992 and then completely in 2016, but homeowners are not currently required to upgrade old systems. However, the state is putting policies in place to address this critical issue. In 2017, the Hawai'i State Legislature passed Act 125 which requires that all cesspools be upgraded by 2050.

A subsequent report published by the DOH in December 2017 identified 14 priority areas throughout the state where cesspool upgrades are critical to protect public health and the environment.

Traditionally, septic systems have been the upgrade of choice, but there's mounting evidence that they won't be sufficient as the leach fields can still lead to pollution, especially if they are poorly maintained. Instead, the gold standard for residential properties is an ATU which uses aerobic biological processes to destroy pathogens and reduce nutrient loads. They do, however, require regular maintenance, as well as energy to power blower motors, which makes it cost prohibitive for many homeowners.

### Counting the Cost of Cesspools in Kaua'i

The town of Hanalei in Kaua'i is a classic example of the problem in Hawai'i. The DOH describes it as an area where "cesspools have the potential to impact sensitive waters." Many homes were built when cesspools were still legal. As a result, several studies have suggested that sewage may be finding its way into streams and the ocean from up to 170 cesspools in the Hanalei watershed.



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A tropical garden scene featuring a stone-lined stream in the foreground, lush greenery, and a thatched-roof house in the background. The scene is captured in a vibrant, natural setting.

# Mahalo!

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