



## UH researcher building resilience in reefs

Ruth Gates, PhD, director of the UH Mānoa Hawai'i Institute of Marine Biology, and her team are racing against time and climate change to breed corals that can withstand future ocean conditions and be used to restore and build resilience in our reefs. Part of that work involves determining why healthy brown corals thrive while those growing right next door turn white or bleach, a sign of stress.

Gates said, "Everybody is affected by it here in Hawai'i because the reef is intimately linked to our health and our economy."

Gates has multi-million dollar support for her world-class research from a number of

prominent sources. Vulcan, Inc., a company formed by Microsoft co-founder Paul Allen, announced in August a \$4 million dollar investment into Gates' and a collaborator's research.

"She's been working in the field for 25 years, amassing this knowledge of coral so that now, in this moment in time, we can really make a difference and accelerate the resiliency of corals," said Janet Greenlee, director of philanthropic communications at Vulcan. "It's a phenomenal opportunity."

Gates' team is working to build a bank of coral stocks that are preconditioned to withstand the warmer and more acidic ocean



*Dr. Ruth Gates*

conditions of the future. She emphasizes that everyone shares responsibility for the environment.

"The thing that we need to really stress is that if you see bleached corals, don't step on them," said Gates. "If you see someone allowing runoff to come into the waters and there is muddy water going over the reef, ask them to stop doing it or report it if it's a developer. Do everything you can to keep the environment around the reefs as clean as possible and as untouched as possible."

As Gates sees it, the earth's future depends on it.



*Healthy coral, viewed through a microscope camera*

# UHWO preps for Hawai‘i’s food future

UH West O‘ahu (UHWO) is taking an important step in supporting sustainable agriculture in Hawai‘i. It is the only UH System campus that offers a Bachelor of Applied Science degree with a concentration in sustainable community food systems.

This exciting multi-disciplinary program addresses the key issues of environmental quality, social equity, community food security and economic development by providing higher education and training to support the local food and agriculture industry.

“Our aim is to train a new generation of food system professionals to think across traditional disciplinary boundaries and to actively solve current problems through work in agriculture, policy-making, planning, business, research and education,” said Dr. Albie Miles, assistant professor of sustainable community food systems.

The program offers students the opportunity to integrate these concepts through senior practica, farm internships and work in the Student Organic Garden on the UHWO campus. This “living laboratory” gives students hands-on experience as they apply the theoretical knowledge they learn



*UH West O‘ahu students working in the Student Organic Garden. Photo by Dr. Albie Miles.*

in class. Bi-weekly weekend work parties are held in the garden, where students, faculty and staff come together to prepare soil, build compost, plant fruit trees, install irrigation, sow seed, weed and harvest. Working in the garden gives students an experiential understanding of sustainable food production and what it entails.

“The food system of Hawai‘i is at a crossroads. Importing an estimated 90 percent of its food, fertilizer, energy and seed, the Hawaiian Islands are uniquely

vulnerable to state-wide food insecurity in the face of rapid global climate change or economic disturbances,” Miles said.

“Food insecurity and diet-related health disparities have long impacted the Native Hawaiian and Pacific Islander communities of Hawai‘i.”

To address these issues, the program was developed in partnership with Kamehameha Schools’ ‘Āina-Based Education Department and the Wai‘anae Coast’s MA‘O Organic Farms.

Funding from Kamehameha Schools was used for academic program development, to conduct a food system assessment of O‘ahu, and in support of the UHWO Student

Organic Garden.

MA‘O Organic Farms is a key community partner and was instrumental in the program’s development, providing valuable input about sustainable organic farming that serves the Native Hawaiian community and is based on traditional practices. In addition, qualified West O‘ahu area students receive college stipends in exchange for working on the Wai‘anae farm as part of MA‘O’s Youth Leadership Training Program.

# mālama 'āina



Photo by Dr. Albie Miles

## Looking to Hawaiian ancestors for ways to sustain food resources

By Lilikalā Kame'eleihiwa, PhD, Kamakakūokalani Center for Hawaiian Studies, Hawai'i nuiākea School of Hawaiian Knowledge

For the past 100 generations, Native Hawaiians have used ancestral knowledge to *mālama 'āina*, or to live in harmony with the land, Haumea, who is our beloved ancestor Earth mother, and from whom all Hawaiian people descend. Our ancestors especially excelled in fresh water management for exceptional food sustainability, feeding an ever-increasing population, estimated at 1 million in 1778 (Kame'eleihiwa 1992).

Our ancestors were so success-

ful that in 1782, King Kahekili of Maui called O'ahu an "*'āina momona*," a "land fat with food" (Kamakau 2002), referring to the great abundance of fresh water on O'ahu that was used to build 113 fishponds comprising 4,200 acres – more fishponds than on all other islands of the Hawaiian archipelago.

In the 1880s, a working fishpond produced 300-500 pounds of fish per acre per year, so that O'ahu was minimally producing 1.3 million pounds of fish per year, not counting the fish obtained from the reefs and beyond (Keala 2007)! Also on O'ahu, ancestors used surface water management to take fresh water from streams

and springs to make *lo'i kalo*, or wetland taro terraces, constructed from the back of valleys down to the shoreline.

These vast *lo'i kalo* systems were built in 63 out of the 80 *ahupua'a*, or valley land divisions, of O'ahu, producing 10-15 times more food per acre than dryland taro, feeding a high population (Kelly 1989). Thus Hawaiian ancestral knowledge used efficient water management of *Lo'i Kalo* and fishponds for successive generations of food sustainability.

To learn more about Hawaiian ancestral knowledge and land management practices, visit [www.avakonohiki.org](http://www.avakonohiki.org).



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## Sustainable Summer '16

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In advance of the International Union for the Conservation of Nature (IUCN) World Conservation Congress Hawai'i 2016 on Sept. 1-10 at the Hawai'i Convention Center, UH Mānoa Summer Sessions will offer several programs focusing on conservation and sustainability. Sustainable Summer '16 will stimulate interest in the IUCN's goals of conserving the environment and harnessing the solutions nature offers to global challenges:

- UHM-IUCN certificate programs
- Sakamaki Extraordinary Lecture Series
- Green films for children and grown-ups
- Hands-on environmental activities
- Sustainable Summer Day



IUCN  
World  
Conservation  
Congress  
Hawai'i 2016

For information and updates about Sustainable Summer '16 programs, visit [www.summer.hawaii.edu](http://www.summer.hawaii.edu). For information about the IUCN World Conservation Congress Hawai'i 2016, Planet at the Crossroads, visit [iucnworldconservationcongress.org](http://iucnworldconservationcongress.org).

# hunt + gather

Don't miss **hunt+gather**, an exhibition that coincides with the 4th Annual Hawai'i Sustainability Summit. The artists' works are made from foraged detritus and curated by Gaye Chan, chair of the Dept. of Art + Art History. The exhibition will be March 6-18, 2016, in the Commons Gallery at the UH Mānoa ART Building.

