Amazing Underwater Meadows of Maui

Helen Anne Schonwalter

Workshop bridges the gap between science and the public.

A workshop called “Amazing Underwater Meadows of Maui” held in the education building at the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS) in early February and sponsored by the Hawai‘i Coral Reef Initiative (HCRI-RP) and the sanctuary, highlighted the newest research on Halimeda kanaloana, a species of algae, or limu, found growing abundantly in underwater meadows surrounding Maui Nui (Maui, Moloka‘i, Lana‘i, and Kaho‘olawe).

Kristine Davis, program director for HCRI-RP, a grant-giving organization that operates in conjunction with the University of Hawai‘i and the National Oceanic and Atmospheric Administration (NOAA), presided over the workshop. HCRI-RP funds research projects that raise awareness about the status of reefs and the growing threat to the ecosystem.

Befitting scientific research that studied fish and invertebrate species diversity within the H. kanaloana meadows, this workshop attracted a diverse group of attendees: visitors to Maui, science teachers, keiki, residents of Kihei, marine biologists and educators, members of the Department of Land and Natural Resources’ Department of Aquatic Resources (DAR), volunteer naturalists, botanists and policymakers, and members of Kanaka Malama Kai—an organization that trains volunteers to take care of the marine environment.

Heather Spalding, a botanist from University of Hawai‘i Department of Botany, called H. kanaloana “the mystery limu.” She said, “Besides its general features, we know very little about this alga.”

Spalding and assistant Matthew Ross set up aquariums on a table within view of the audience with living H. kanaloana, soft sponges and collector urchins. “It’s neat to touch this alga,” she said, and the keiki present in the audience did just that.
Through Spalding’s animated talk, she demystified the scientific method of inquiry. “What role does H. kanaloana have in Hawai’i’s ecosystem?” she asked herself and found her topic for a Ph.D. (doctoral) dissertation.

Besides studying H. kanaloana lifespan and growth, Spalding studied the number of individual H. kanaloana in a given area or quadrat, a small rectangular sampling area set aside to study and count vegetation. And with a hands-on approach to her talk, Spalding demonstrated the use of a simple device comprised of four short PVC pipes joined to make a rectangle.

“I randomly threw it on the sandy bottom in meadows at locations like Kahekili Beach (Airport Beach), 30- to 140-foot depths, and measured how the density of plants changed through time,” Spalding said. “Although the abundance varies from meadow to meadow, H. kanaloana is a very common alga in Maui Nui.”

Amanda Toperoff, a graphics designer who presented a Halimeda video and other science-themed animations in her talk “Halimeda For Everyone,” said, “I use new technologies to reach broader audiences and to raise public awareness of conservation.”

Her media “bridges the gap between scientists and the general public,” Toperoff said, and “makes science more accessible to everyone.” Indeed, the user-friendly Website www.hawaii.edu/ssri/hcri shows hands picking invasive species one by one, like a Pac-Man gobbling up aliens.

Media conveys the message: “the actions of the public impacts the environment,” Toperoff said. In this case, our impact can be positive by eliminating the invasive species, or, by stopping the dumping of effluents into our waters from cruise ships (or other ships’) that inadvertently deposit invasive algae into the sandy bottoms of the deep sea (benthic zone).

Of course, not everyone is fortunate enough to dive to depths of up to 600 feet in a submersible to conduct research, or to clean up invasive species. But with the aide of Toperoff’s Website, the public can enjoy a virtual experience of scientific research.

Toperoff’s Website has Hawaiian names alongside the scientific ones for each species of flora and fauna. I was delighted by this inclusion, and a member of the audience, Kuhea Para-cuelles, environmental coordinator of Maui County, commented on the name of the alga under study: Halimeda kanaloana. The scientist who named this alga referenced the revered Hawaiian god of the ocean, Kanaloa. To bridge the gap between scientists and the local population in Hawai’i means to acknowledge the culture.

Paracuelles said in response to another speaker’s presentation that enumerated the various species of fish, invertebrates and mollusks, “we need to preserve species not only for commercial and recreational reasons, but for their cultural importance to Hawaiians.”
Spalding shared information about an amazing property of Halimeda kanaloana. She said, “When injured, [H. kanaloana] demonstrated a plugging mechanism... a muscillage that healed the wound.”

Although scientific research is methodical, the conclusions from research are often serendipitous. Dr. Ross Langston of Windward Community College, in enumerating the variety of organisms (epifauna) found in the Halimeda meadows, said, “These species interact with Hawaiian coral reefs... Several of these organisms were found attached to segments of the Halimeda. The research in the meadows found 44 fish species from 25 fish families: wrasses, gobies, goat fish and other common species.”

That research relates to conservation cannot be denied. Because H. kanaloana is so abundant in Maui Nui waters, Langston regards kanaloana as a keystone species of the ecosystem. “We don’t know that much about the life histories of small fish and invertebrates; they may be the canaries of the marine environment,” he said. (Canaries are used to test the toxicity of the air in mines. If the canary dies, the environment is assuredly toxic to the miners and other species that inhabit the caves that are mined.)

I left the workshop exhilarated and encouraged by the presence of the young volunteers and talk of the pending changes to the K–12 science curriculum which emphasizes inquiry-based learning and place-based knowledge.

The marine environment that surrounds us in Hawai‘i is our kuleana—our responsibility and our joy.

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She helps fund reef-saving research projects in Hawai‘i.

Dr. Kristine Davis, program director for the Hawai‘i Coral Reef Initiative.

Amanda Toperoff, Heather Spalding and a visiting science teacher from O‘ahu. A hawksbill turtle (inset) grazes through a Halimeda meadow.