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TO CHERISH • CONSERVATION NEWS FROM THE UNIVERSITY OF HAWAIʻI • SUMMER 2016

SOEST student joins Antarctic expedition

McKenna Lewis, an undergraduate global environmental science (GES) major in the UH Mānoa School of Ocean and Earth Science and Technology (SOEST), recently returned from a 6-week expedition to Antarctica.

Lewis traveled to Antarctica to be part of FjordEco, a collaborative research project led by scientists from UH Mānoa, Scripps Institute of Oceanography and the University of Alaska at Fairbanks.

The goal of the project is to learn more about the understudied fjord ecosystems of the Western Antarctic Peninsula, and understand the physical and biological drivers of the highly productive ecosystem and its sensitivity to climate change.

Onboard the Antarctic Research and Supply Vessel Laurence M. Gould, charted by the National Science Foundation, Lewis worked closely with Craig Smith, PhD, oceanography professor at SOEST.

"The UH team was investigating the benthic ecology – that is, the complex interactions between organisms that live on or in the seafloor– of this region," said Lewis. "With my interest in ecology, I am excited to focus on that for my senior thesis project."

McKenna Lewis with a sea spider in Antarctica

As a student of the GES degree program, Lewis learned about FjordEco at a series of presentations designed to match GES students with research mentors for their required research thesis experience.

In the first weeks of the cruise, the team prepared and deployed several moorings that held either sediment traps to catch particles that fall to the ocean floor or a time-lapse camera.

Later, the UH team took cores of sediment from the seafloor that were sliced into sections, preserved, and will later be analyzed at SOEST. They also conducted trawls to collect organisms in a net pulled through the water. Lewis and others washed and sorted those organisms, took pictures of them and preserved the specimens for later identification and analyses.

"Processing the trawls was my favorite operation because, although it was time consuming and unbelievably muddy, being able to hold and closely observe organisms from the benthos, which I'd only ever seen in BBC documentaries or preserved in bottles, was so exciting!" said Lewis.

"A trawl we did in the inner basin of Andvord Bay came up chock-full of ophiuroid (sea stars) and pycogonids (sea spiders)," she said. "Another trawl in the Gerlache Strait had a few dozen sea pigs. It was fascinating to see changes in species abundance and diversity from trawl to trawl within the fjord and out onto the open shelf."

"My experience as a participant on this cruise has exceeded any hopes I had as an undergrad from Hawai'i. The awe-inspiring views in Andvord Bay paired with calm, fjord-protected waters bring to mind only one word: paradise," said Kaua'i-born Lewis.

Alumnus brings sustainable fish pond to Sāmoa

The "Vailepa o Manunu" Community Development Fish Pond Project will enable families to harvest locally grown fish, which will significantly boost nutrition for the village.

Inspired by participating in a study abroad program while an undergraduate at UH Hilo, Joshua Tarbox decided to embark on a Peace Corps experience shortly after graduating in 2014.

Peace Corps volunteer and UH Hilo alumnus Joshua Tarbox (left) works with members of the village of Manunu, Sāmoa, to build a fish pond.

Adventurous at heart, Tarbox, who hails from Fairbanks, Alaska, and earned a BA in communication from UH Hilo, is now living in the village of Manunu, Sāmoa, which has a population of about 300 people. The main food source of the village comes from a family-owned plantation in the surrounding mountains. Fresh fish is not readily available since Manunu is far into the mountains and the river nearby does not contain fish big enough to consume.

To help solve this problem, Tarbox worked alongside villagers to build a permanent fishpond for the community, providing a space for fish to thrive. Eventually the fish will be available for consumption, and ultimately for sale.

"The nutritional value that comes from having a fish pond ecosystem will be the first in history for the village of Manunu," said Tarbox.

"The amount of employment that can be gained by selling fish from future family-built ponds will boost the village economics greatly," he said.

"We have partnered with the Ministry of Fishery in Sāmoa, and they have provided us with a sustainable freshwater fish, tilapia, to jump start our fish hatchery!"

A HELICOPTER AND A PAINTBALL GUN:

New tools in battling invasive species

James Leary, PhD, associate professor in the College of Tropical Agriculture and Human Resources (CTAHR), is battling invasive species with his innovative Herbicide Ballistic Technology (HBT™). Leary has invented a way to adapt readily-available pneumatic paintball guns to shoot small gelatin capsules filled with herbicide to control invasive plants and trees.

On Maui, Leary's main focus is miconia, an invasive weed that shades out native plants and damages the ecosystem.

The paintballs, custom made by Nelson Paint Company, can be used to treat hard-to-reach areas like cliffs and ravines. The technology also reduces disturbance of remote areas and is safer for the person applying the herbicide because the chemical is safely contained in the small projectiles.

Dr. James Leary, in helicopter at right is turning paintball guns into weapons in the fight against invasive species. Below, he takes aim at miconia on Maui.

Further, this approach allows for targeted and cost-effective treatment of invasive plant species. While riding in a helicopter, Leary can treat an individual invasive plant from a range of up to 100 feet.

"We're able to, with our efforts, protect an acre of forested watershed at less than $10," Leary said in a recent news report. "So it's a very economical approach, because of the efficiency the helicopter provides."

In a previously published paper, Leary, in collaboration with the Maui Invasive Species Committee, described how more than 4,000 of the invasive weed trees were targeted and eliminated in remote areas of Maui watershed in just over a year using the revolutionary HBT.

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Learn to conserve: Sustainable Summer Day

In advance of the IUCN World Conservation Congress Hawai'i 2016, the UH Mānoa Summer Sessions' Sustainable Summer Day kicks off an array of programs focusing on conservation and sustainability.

Bring the entire family to UH Mānoa for a day of environmental learning and conservation-related fun! Participate in hands-on activities. Relax with tai chi, yoga, meditation and live music. Watch free environmental movies and animation for kids from around the world. Learn about local conservation efforts and organizations involved in sustaining and protecting our state.

Come and learn, participate and make a commitment to the future of our planet! Activities include:

- **Exhibition booths with information and volunteer opportunities**
- **Entertainment**
- **Campus walking tour of endangered and threatened plants**
- **KIDS FIRST! Film Fest 12:30–6:15 p.m., Art Auditorium**
- **Hands-on activities**
- **Vegetable seedling giveaway**
- **Tai Chi and yoga/meditation (participants encouraged to bring their own yoga mats)**
- **Healthy food options**

Sustainable Summer Day is a minimal-waste event. We encourage everyone to bring their own refillable water containers.

For information, call 956-9246 or visit **summer.hawaii.edu**.