

**Stanford students literally reap the benefits:  
Learn about the Hawaiian culture, aina during 11-week field course on Hawaii Island**  
By Landry Fuller, Special to West Hawaii Today



NORTH KOHALA – For the past eight years, 20 or so Stanford University students have headed to the Big Island every other fall to spend a quarter studying traditional Hawaiian crops, aina and culture.

During the 11-week Hawaii field course, students study separate modules on soils, volcanoes, coral reefs, community ecology, traditional and modern agriculture and community-based resource management.

Ulu Mau Puanui – a nonprofit 501c3 farm near Hawi – is their outdoor classroom for four of the days.

“I love what I do; the opportunity to work on the aina with great likeminded teachers and students to keep the land happy and healthy,” Kehaulani Marshall said, who has been Ulu Mau Puanui’s executive director since 2011.

Ulu Mau Puanui, which means to continue to grow, is a small farm on 1,200 acres owned by Kamehameha Schools near Hawi. Only 100 yards wide, the land winds down Kohala Mountain for 12 miles towards the sea.

Three small gardens on the farm are used for hands-on education to teach students how Hawaiians sustained rain-fed, unirrigated intensive farming for centuries.

Peter Vitousek, born and raised on the Big Island, has been a professor in Stanford University's biology department since 1983. He started the gardens with Oliver Chadwick, a professor at UC-Santa Barbara, and Sara Hotchkiss in the Department of Botany at University of Wisconsin.

The gardens were first planted in 2010. The overall goal is to figure out how the original dryland field system thrived.

“Our work is to figure out how our ancestors did it. There's not much in literature, with most found in the land manager's notes to transfer the responsibility to the next person explaining how they planted or cultivated,” Marshall said. “Now we're bringing the science and culture together to continue learning.”

Vitousek has learned much over the past eight years.

“Agricultural field walls mark the Hawaiian system (at Ulu Mau Puanui) and it's fascinating because this area had 25 square miles of field walls and paved trails running mauka to makai that were really the staple food basket of this area on the island,” he said. “The remains of it, in a lot of places, has been bulldozed but in other places it's really clear. And yet people had lost touch with that. We've brought kids from this area and they had no idea it was here.”

On Nov. 25, Stanford students spent a full day harvesting sweet potatoes and preparing to replant them on the farm.

“We're stripping off all the old leaves of the uala (sweet potato) we harvested and making sure there's no rot or anything so they're ready to be replanted (in the upper garden),” one of the students mentioned.

Michael Burnett, a teacher's assistant at Stanford, shared the results of a bucket experiment he created in the garden to measure the amount of rainwater trapped by ko, the Hawaiian word for sugarcane. He learned that those buckets closest to the windward side of the ko collected twice as much as those on the leeward side. As result, sweet potatoes grew much bigger than those on the opposite side.

“The Native Hawaiians had a paired system where they would grow the uala as their staple crop with ko as a wind break and mist catcher,” he explained. “Nobody has really quantified scientifically how much water it catches or where the best spot is to grow the sweet potato in relation to the ko rows. Native Hawaiians figured out how to do this, but it has been lost over the last several hundred years. This is a chance for us to use science and our modern analytical techniques to figure it out how to do this again, bringing the knowledge back to life and allowing people to use it.”

The farm's three gardens have varying purposes.

"This second garden is substantially dryer, so we see a difference in what grows there," Vitousek pointed from the side of a pu'u. "We've also grown gourds there, in addition to uala and ko. It's only about 600 meters away from the first garden and yet it's about 12 inches drier in rain. If you go another mile and a half down the slope to the third garden, it's really dry. We've only ever gotten a crop out of there in winter during Kona rains."

He thinks they now have an idea how the ahupua'a worked originally for the Native Hawaiians.

"People think of ahupua'a as watersheds and managing the flowing water in the center, but here and in Kona there is no flowing water," Vitousek said. "We think what happened here was the lower edge of the field system is warm and wet in the winter and the upper edge is cold and wet in the winter, but it's warm and moist in the summer so they probably farmed down there and then up here and only having an ahupua'a could you do that."

The Stanford students also learned about connecting with the land, the deeper meanings of the Hawaiian language and how coral grows in the ocean surrounding the Big Island. They visited Kauai to study the soil and interact with community members.

Back on the Big Island, the students visited Stanford graduate Noa Lincoln's breadfruit farm at Hawaii Ulu Cooperative in South Kona.

"Seeing a Stanford alum like come back and do all this is very meaningful and what I want to do," sophomore Mireille Vargas said.

The students also spent a morning at The Kohala Institute in Kapaau and learned about modern ranching from Pono Von Holt, challenges and opportunities for farmers in Lalamilo in Waimea, food security and sovereignty in Hawaii and a longterm vision for resource management.

The Stanford field course will conclude Dec. 14. During the last two weeks of their visit, the Stanford students are conducting final projects.

"I'm working with Hualalai Resort to see what species of oysters could be used to clean one of their lakes of the runoff from their golf courses," Vargas said.

Torrie Eagle Staff's focus is on Native Hawaiian medicinal plants and is working with HuiMAU, a community-based nonprofit organization in Hamakua.

### **Outdoor education for local schools**

Ulu Mau Puanui is an outdoor classroom for numerous other schools and colleges around the island, state and on the mainland. Adults and community members can visit on monthly volunteer clean up days or other arranged trips.

"The programs we offer were created to perpetuate Hawaii's culture through land-based education and culturally-driven science. Students from UH-Hilo and Manoa come for anthropology and geography classes," Marshall said. "Waimea Middle School, Kanu o ka Aina high schoolers, Kohala Middle School and Hawaii Preparatory middle high school students have

also visited. Kamehameha School students come to study environmental science and resource management during the summer.”

Community groups or distant schools most often partake of one-time visits that include a vigorous hike, a brief talk about the Kohala Field System and a short moolelo, or ancient story, followed by a Q&A and hands-on work on the land.

“A lot of them want to get their hands dirty in the aina – to plant, weed or harvest,” Marshall said. “We do everything by the moon, following the Hawaiian lunar month when we’re planting.”

Science experts also visit Ulu Mau Puanui to study the soil and rain gradients.

The setup of Ulu Mau Puanui was funded by a National Science Foundation grant and Kamehameha Schools funds the nonprofit annually.

Community volunteer days are from 8:30 a.m. to 12:30 p.m. the second Saturday of each month, including this Saturday.

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