THE KOHALA CENTER
education. environment. empowerment.

FRONT PAGE

New Life at Kahaluʻu: Remembering the Past and Embracing the Future

Photo: TKC's leadership team celebrates the opening of the Kahaluʻu Bay Education Center on December 3, 2011. **From left to right:** Roberta Chu, President of the Board of Directors; Elizabeth Cole, Deputy Director; and Matt Hamabata, Executive Director.

> *It's my opinion that when people see and understand the integrity of a native point of view with a scientific and spiritual essence to it, then there's pause to create questions of how. For example, how can we care and how can we expand this caring attitude to all other aspects of our relationships with the world. The renewal efforts at Keauhou-Kahaluʻu make visible the connections between mauka and makai (mountain and sea)…indeed, they make it clear that, yes, we have all come via the great waters of life.* —Al Lagunero, Hawaiian muralist who created the painting that graces the Kahaluʻu Bay Education Center van

In 2006, Sara Peck of UH Sea Grant and community members approached The Kohala Center (TKC) and asked if we could help sustain and expand the ReefTeach program she created and implemented at Kahaluʻu Bay. This program educates visitors about how to take care of the coral reef and natural resources in the bay. Visitors, not knowing any better, were trampling on the live corals and killing them. Between 350,000 – 400,000 visitors visit Kahaluʻu yearly, attracted by the shallow waters and easy access to the bay's dynamic reef environment. With the help of our partners at NOAA (National Oceanic and Atmospheric Association), HTA (Hawaiʻi Tourism Authority), and KIC (Kamehameha Investment Corporation), TKC adopted the ReefTeach program at the bay and began recruiting volunteers to help educate visitors on proper reef etiquette. Volunteers who were passionate about saving Kahaluʻu Bay showed up every week to educate our visitors. Some of these original volunteers are still with us today, six years later. "They are precious treasures in our community," says TKC's Outreach and Volunteer Coordinator, Cindi Punihaole. "We are proud to know them…they have become *ʻohana* (family) to us," she says.

Because of our commitment to restore Kahaluʻu Bay, in 2011 the County of Hawaiʻi awarded The Kohala Center a ten-year contract to manage Kahaluʻu Beach Park vendor operations and create an educational center there. On December 3, 2011, the Kahaluʻu Bay Education Center was blessed and officially opened to the public. Read "Fulfilling the Dreams of Our Kūpuna" on the Back Page to learn more about the new education center and TKC's vision for the future.

Cornell EES Program: Planting a Future Forest

By Alexandra Moore, Director, EES Field Program

Photo: Dylan Webster and Claire McKinley measure outplants at Kaʻūpūlehu.

January marks the return of Cornell University students to Hawai‘i Island. In 2012 we will have a class of 16 students from Cornell University and Oberlin College. The group will arrive on January 14 for a four-month immersive living and learning experience. As we get ready to welcome our new class to the CU Field Program in Earth and Environmental Systems (EES), we also look back on the accomplishments of our previous student groups.

2011 was the third year that the EES program has endeavored to offset all of our carbon dioxide emissions and run a carbon-neutral program. We monitor our carbon footprint; calculate the CO2 emissions from all of our air travel, ground travel, domestic energy, food, and waste; and we work to make that footprint as small as possible. Our three-year cumulative carbon footprint is 190 metric tons of CO2. The emissions we cannot eliminate are offset through reforestation. Working with island conservation partners, we help to restore degraded native forest ecosystems. Cornell EES students have, to date, outplanted more than 1,500 plants—including trees, shrubs, vines and grasses—representing more than 40 native species, at five separate restoration sites. We continue to monitor the survival and growth of our *keiki* plants, as they grow their way through a period of severe island-wide drought. The results are very encouraging, as overall mortality is low and many of the outplants are thriving.

Read “Small-Scale Solutions” on the Back Page to learn more.

BELL Hawai‘i Scholarship Opportunity

Photo: BELL 2011 participants enjoying their last sunset together as a group at their marine camp at Kawaihae Harbor.

> *Brown’s Environmental Leadership Lab (BELL) Hawai‘i is a long-standing partnership between The Kohala Center and Brown University. BELL Hawai‘i offers students with interests in science, leadership, and cultural studies an unparalleled opportunity for place-based learning in the world’s most vibrant living laboratory—Hawai‘i Island.*
> —Erica Perez, Expeditionary Learning Coordinator for The Kohala Center

The 2012 BELL Hawai‘i program runs from March 30–April 6 and features a wide range of workshops and presentations focusing on marine science, geology, volcanology, and traditional Polynesian navigation practices. This spring, a group of 30 students will have an opportunity to kayak and snorkel at some of Hawai‘i Island’s most

pristine coral reefs, hike through lava tubes, explore native rain forests, conduct service work in rare dry forests, and talk story with respected *kūpuna* (native Hawaiian elders). Highlights of this year's program include:

- Uncle Chad Paishon will teach the students about native Hawaiian voyaging practices.
- Sian Olsen, owner and operator of Kohala Kayak Sian, will take students on a guided kayak tour of Hawai'i's coral reefs.
- Rob McGovern of the Volcano Art Center will guide the group on multiple hikes in Hawaiian Volcanoes National Park, to explore lava tubes, craters, steam vents, and historic lava flows.
- Lyn Howe and Geoff Rauch, organic eco-farmers, will explain sustainable farming practices and lead the students on a tour of their off-grid farm, where they will have the opportunity to sample locally grown fruits.
- Yvonne Carter will teach the students about the rare endemic species found in the Ka'ūpūlehu Dryland Forest, and the group will help with outplanting of native species and pulling invasive weeds.
- Ku'ulei Keakealani, curator at the Ka'ūpūlehu Interpretive Center at Kalaemano will guide the group around this ancient salt-making and Hawaiian petroglyph site.

The Kohala Center and Brown University are partnering to offer one full-tuition scholarship to a Hawai'i Island high school student. **January 23, 2012** is the application deadline for students wishing to apply for this scholarship. The student who is awarded this scholarship will also be required to complete Brown University's application (http://brown.edu/ce/pre-college/leadership/hawaii/) by February 2, 2012. For more information and online links to application materials, visit http://www.kohalacenter.org/scholarships/bellhi.html.

HI-SEES: Providing the Means to Do Science in the Field

> *The financial and classroom support provided by The Kohala Center through the HI-SEES program encourages and enables me to provide a high-quality, place-based, hands-on learning experience that enriches my students' learning experiences. I have heard 100% positive feedback from students about this program. Students all concur they get more out of a hands-on experience in the field than they would just learning from a book. Some of the students have never been to Kapoho or ever really observed tide pools and their contents. Their HI-SEES experience adds to their knowledge for their future classes and to their life experiences.*
> —Charlotte Godfrey-Romo, Hilo High School science teacher

HI-SEES, or Hawai'i Island Science-based Environmental Education for Students, provides science-based and place-based environmental education for middle and high school students. The HI-SEES program was launched in July 2012 and will run through the current school year, culminating in a scientific conference for participants in May 2012. Currently, ten teachers and their students at seven island schools are engaged in the study of particular aspects of Hawai'i Island's marine or forest ecology. The goal of HI-SEES is to fully engage students in the scientific research process, so that students learn science by doing science and by applying their scientific findings to better understand real-life issues in their own communities.

Photo: Melora Purell leads a group of students from HPA into Kohala Mountain.

HI-SEES research projects incorporate various forms of technology and integrate indigenous resource knowledge and management systems with Western approaches to watershed resource management concepts. Scientific and cultural experts work closely with participating classroom teachers to assist with classroom instruction, research design, data gathering and analysis, and to provide logistical and financial support. Erica

Perez, The Kohala Center's Expeditionary Learning Coordinator, and Melora Purell, Coordinator of the Kohala Watershed Partnership, are this year's HI-SEES education specialists. Kuʻulei Keakealani, the cultural specialist for Kaʻūpūlehu Dry Forest Restoration Project, along with Yvonne and Keoki Carter, are working with Konawaena Middle School teachers to incorporate the Kaʻūpūlehu ahupuaʻa into student projects. Marine biologists Kaipo Perez and Courtney Couch are sharing their research of coral reefs with students at Hilo High School and Innovations Public Charter School.

"Teachers need assistance with the costs and logistical details of taking their students out into the field," explains TKC's Erica Perez. "We provide transportation, mini-grant funding for in-class materials, scientific specialists, cultural specialists, and whatever other support teachers need. It is a privilege to work with Hawaiʻi educators and provide them with the opportunity and means necessary to do science in the field. For many of our students and teachers, HI-SEES provides their only field trip during the school year," Perez says. The HI-SEES project is funded by the American Honda Foundation and the Atherton Family Foundation.

Read "Anyone Can Become a Scientist" by Charlotte Godfrey-Romo, Hilo High School science teacher, on the Back Page to learn why HI-SEES matters to Hawaiʻi's teachers and students.

In Language There Is Life

Photo: Some years ago, Larry Kimura served as Merrie Monarch parade escort for Hawaiʻi Island.

> *A proverb in Hawaiian captures the essence of language very simply: I ka ʻōlelo nō ke ola, i ka ʻōlelo nō ka make. In language there is life, in language there is death. In other words, language is the essence of one's identity. Without your own language your identity is lost, or more analytically commented on as replaced by some other identity, not truly your own. Big languages of the world such as English have already assimilated many minority ones into their domain.* —Larry Kimura, Mellon-Hawaiʻi Doctoral Fellow

2011–2012 Mellon-Hawaiʻi Fellow Larry Kimura is a doctoral candidate in the Hawaiian and Indigenous Language and Culture Revitalization Program at the University of Hawaiʻi at Hilo. Kimura has worked in the University of Hawaiʻi system for the past 40 years, teaching Hawaiian courses in Hawaiian language and culture. Kimura co-founded ʻAha Pūnana Leo in 1983 and helped to establish the first Hawaiian language immersion preschools in 1984–1985, with the goal of producing native speakers of Hawaiian among preschoolers. Kimura served as the first director of the Pūnana Leo Pre-School in Honolulu from 1985–1989. In 1987, he helped to establish the State Department of Education Hawaiian Immersion Program. Kimura was born in Honokaʻa and raised in Waimea, where his Hawaiian speaking grandfather and uncles worked as cowboys.

"A people living their lives through their own language, unique only unto themselves, is the essence of that people. It is a catastrophe for humankind to stand by and let this fundamental quality of life perish," says Kimura. "I see this life force in all living things on this planet, such as in the variety of plants I see in my yard and into the distant landscape. Each genus comes from unique origins and each has a role to play in the continuum of life's evolution. Honoring and maintaining uniqueness is critical," he says.

Kimura's thesis, *An Analysis of the Terminal Language of the Native Hawaiian Speaker: A Comparison of the Native Language of Two Generations, the Standard Language of the Parent and the Persistent Language of the Offspring*, focuses on sensitizing Hawaiian language instruction to the informal register of language use, in order to accommodate a more holistic approach for Hawaiian proficiency. Kimura is mentored by Dr. William H. Wilson of the Ka Haka ʻUla O Keʻelikōlani College of Hawaiian Language at UH Hilo.

Read "A Culture Encoded in Language" by Larry Kimura on the Back Page to learn more about Kimura's work to revitalize the Hawaiian language.

Seed Workshops on Oʻahu and Maui

Photo: Kauaʻi Workshop participants separate seeds from the pod.

In November 2011, The Kohala Center launched the Hawaiʻi Public Seed Initiative with a two-day Seed Basics Workshop and optional farm tour on Kauaʻi. Forty farmers and home gardeners attended and were presented with a wealth of information on how and why to save seed.

The Kauaʻi Seed Workshop demystified the basics of gathering my own seeds and empowered me to imagine a greater involvement with our garden. Bringing this knowledge and these friendships back to the garden has invigorated our daily work with enthusiasm and the knowledge that we are not doing this alone. —Paul Myers, home gardener who attended the Kauaʻi workshop

"Seed Basics for Farmers and Gardeners" is tentatively scheduled to be held at the Lyon Arboretum on March 24 and in Waianae on March 25, 2012. The Oʻahu workshop will include both lecture presentations and hands-on fieldwork at demonstration farms, so participants can practice harvesting, selecting, cleaning, and storing fresh seed. Strategies to account for differences in elevation, weather patterns, and rainfall will be discussed. Oʻahu presenters include:

- Alvin Yoshinaga, retired Seed Conservation Laboratory-Restoration Ecologist at UH Mānoa, will share his seed storage expertise;
- Hector Valenzuela, Ph.D., CTAHR Extension Office, will share his knowledge as a Vegetable Specialist;
- Russell Nagata, Ph.D., CTAHR County of Hawaiʻi Extension Administrator, will share his extensive knowledge of lettuce propagation and seed production; and
- Glenn Teves, CTAHR Molokaʻi Extension Office, will share his knowledge of taro and tomatoes.

Photo: Participants in the Kauaʻi Seed Workshop preparing taro *huli*.

The Maui Seed Basics Workshop is slated for May 19-20, 2012. Maui presenters include:

- Hector Valenzuela, Ph.D., CTAHR Extension Vegetable Specialist;

- Russell Nagata, Ph.D., CTAHR County of Hawai‘i Extension Administrator;
- Glenn Teves, CTAHR Moloka‘i Extension Office;
- Paul Massey, Regenerations Botanical Garden;
- Local experts Gerry Ross and Penny Levin; and
- Nikki Duncan, who is visiting from the U.S. Mainland, will share her extensive experience growing, processing, and saving grain on a small scale.

For more details and registration information, visit http://www.kohalacenter.org/seedbasicsworkshop/about.html. Please contact Lyn Howe at seedproject@kohalacenter.org for more information on scholarship opportunities for youth who are interested in agriculture to attend these workshops.

Visit http://www.kohalacenter.org/seedbasicsworkshop/kauai.html to view the agenda and photos from the Kaua‘i workshop, or read “The State of Seed” (http://hawaiihomegrown.net/reports/288-thegardentalks-the-state-of-seeds) in the Hawai‘i Homegrown Food Network newsletter for a firsthand account of the November workshop.

Learning Opportunities in Hawai‘i’s School Gardens

Photo: Broccoli grown at Mala‘ai: The Culinary Garden of Waimea Middle School. Photo courtesy of Amanda Rieux.

The Hawai‘i Island School Garden Network has announced its spring 2012 workshop series. Workshops are geared for school garden teachers in the Network, but home gardeners and interested community members are invited to attend. Participation is free of charge.

This workshop was fantastic. It opened a whole new horizon of opportunities for local organizations to find funding. —Bob Green, Waikoloa community member who attended the Beginning Grant Writing Workshop with Koh Ming Wei on December 3, 2011

Upcoming workshops include a Garden Chef cooking demonstration at the Hawaii Academy of Arts and Sciences in Pahoa, a workshop on preparing traditional Hawaiian foods at Ke Kula ‘o Ehunuikaimalino in South Kona, and two food safety workshops with Nancy Redfeather.

For a complete listing of upcoming workshops, visit http://www.kohalacenter.org/HISGN/workshops.html. For additional information or to register, contact Donna Mitts at dmitts@kohalacenter.org or 808-936-2117.

Nurturing the Relationship between Students and the Land

Photo: Students at Mala‘ai Garden feed their hens.

> *The funding support we receive through the Hawai‘i Island School Garden Network enables us to continue our work nurturing the relationship between our students and the land with hands-on learning in our garden. Ma ka hana ka ‘ike, by doing one learns. We are preparing our students to make informed decisions about the land, their culture, and their own health in the future.*
> —Amanda Rieux, Program Director and Garden Teacher, Mala‘ai: The Culinary Garden of Waimea Middle School

Sixteen Hawai‘i Island schools have received grants from The Kohala Center to support funding for their garden educators, for curriculum development, and for garden supplies. At the start of the current school year, schools that had a garden or were beginning a garden were invited to apply for HISGN funding. Schools are asked to match the amount of their Kohala Center grant with money from their school budget or with funds from other grants and fundraisers. Selected schools were also offered gift certificates for $50 worth of merchandise at Home Depot in appreciation for their participation in a professional evaluation of their programs.

Read “School Garden Grantees” on the Back Page to learn more.

School Garden Profile: West Hawai‘i Explorations Academy

Photo: Teaching at WHEA really means “NSLI,” or “No student left indoors,” says WHEA Middle School Teacher, Sara Medeiros.

> *You wouldn’t believe all the real-world academic applications there are to wrapping your hands around a seed bed. My students take both qualitative and quantitative data, they keep journals, they research where plants came from, and how they got (historically) here or there. They construct meaning out of these different variables, to understand why or why not this or that has happened. They engineer ways to keep their garden going. And when the year is over, they are aghast when I tell them it is time to put the garden to bed, meaning tear it down, take home plants, and make the ground ready for the next crop of 6th graders.* —Sara Medeiros, WHEA Middle School Teacher

West Hawai‘i Explorations Academy (WHEA) is a public school serving students in grades 6–12, founded 18 years ago on a vision of innovation and invigoration of public education. WHEA integrates its curriculum into science projects which encourage students to participate in hands-on activities and gain skills that can be used to solve problems in the real world and in their future careers. WHEA is probably best known in the community for its student projects that include building solar and electric cars and for projects involving the marine resources available at the Natural Energy Laboratory of Hawaii Authority (NELHA). Gardening and agriculture projects at the school have expanded noticeably in the last five years. WHEA teachers help students develop garden- based project ideas and advise them on their gardening activities. Currently, WHEA students are

experimenting with using deep ocean water to chill the soil, growing plants in hydroponic and aquaponic systems, using various organic fertilizers such as compost tea, and growing medicinal plants and plants that attract butterflies. These projects involve the students in growing various vegetables, fruits, herbs, and flowers.

> *I have learned how to care for a variety of plants. I've also learned how to work with other students to get tasks done. I think that our plant projects have progressed over time. I have more knowledge of plants now, so I don't have a negative relationship with plants anymore. This means that whenever I see a plant that needs water, I don't just ignore it; I water it and help it out. So I guess what I am trying to say is that I've learned compassion for other living things.* —Taylor Anderson, senior at WHEA

Read "Compassion for Living Things" on the Back Page to learn more about WHEA's garden program.

Scholarship Season at Hawai‘i Community Foundation

Photo: Courtesy of http://www.hawaiicommunityfoundation.org/scholarships and used with permission here.

Scholarship Season has begun and this year Hawai‘i Community Foundation (HCF) has a new application process to make it easier for students to find all of the scholarship funds for which they may be qualified. The deadline for scholarship applications is February 17, 2012, and the HCF Web site is now open for students to submit their applications and related materials.

HCF requires its scholarship applicants to meet the following criteria:

- Be a resident of Hawai‘i.
- Demonstrate financial need.
- Plan to attend an accredited two- or four-year college or university as either an undergraduate or graduate student.
- Be a full-time student.
- Demonstrate academic achievement—minimum grade point average of 2.7 unless otherwise stated.
- Exhibit good moral character.

However, students who don't meet one or more of the listed criteria may still qualify. Please encourage anyone you know who will be attending college starting in the fall of 2012 to visit the HCF Web site at http://www.hawaiicommunityfoundation.org/scholarships and apply.

Fulfilling the Dreams of Our Kūpuna

By Cindi Punihaole, TKC's Outreach and Volunteer Coordinator

Photo: Kahaluʻu Bay Education Center set up on opening day, December 3, 2011.

In 2007, I visited Hanauma Bay on Oʻahu and spoke with Alan Hong, manager of the bay. I was very impressed with his courage and commitment to restore Hanauma Bay. The bay was on the verge of dying when Alan decided to create the education center there. Today, Hanauma Bay is beautiful and the coral and fish are returning. His vision became a reality and he made a difference for the betterment of his community and for all humanity. When I told him about our vision for restoring Kahaluʻu Bay, I remember Alan saying to me, "It will be a hard road to travel, but don't give up because you know you are doing the right thing."

In 2008, TKC invited the University of Washington landscape architecture students and their professor to help develop a conceptual master plan for Kahaluʻu Beach Park. The students held two design charettes and listened to voices of key stakeholders, ReefTeachers, community members including our homeless residents, and County officials. In six days, the architecture students had crafted a master plan (http://www.kohalacenter.org/kahaluubay/restoration.html) for Kahaluʻu—a plan which was driven by the community's input and which reflected the hopes and dreams of all participants. It was an amazing, wonderful week.

Photo: Wally Lau, Deputy Managing Director; Robert Fitzgerald, Director of the Department of Parks and Recreation for the County of Hawaiʻi; and Cindi Punihaole, TKC's Outreach and Volunteer Coordinator at the December 3, 2011 blessing of KBEC.

Our new contract with the County allows us to use their lands at Kahaluʻu Beach Park to conduct educational programs and to implement the Kahaluʻu Beach Park Master Plan. As part of our educational outreach efforts, The Kohala Center will manage a snorkel rental concession through which visitors can learn how to enjoy the bay and at the same time protect its fragile environment. All profits from this outreach effort will be reinvested in programs at the bay and to the restoration of the park.

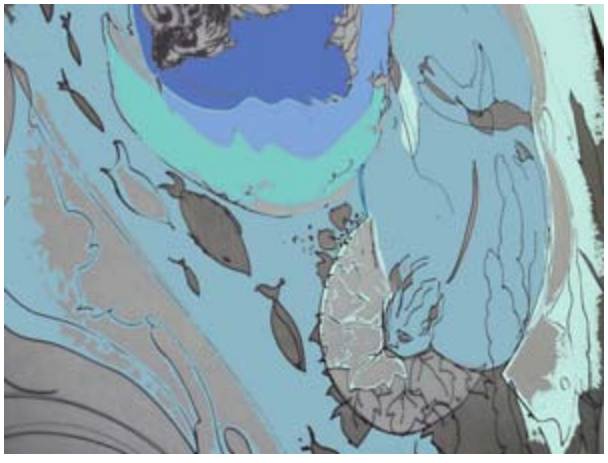

Image: Al Lagunero is the famous Hawaiian muralist who created this image. He is family of the lands of Keauhou, the name of Haʻaniʻo. This mural depicts a swimmer with a circlet of *kukui* leaves by his chin. Above and to the left of him is a dark cloud which signifies a pig's head. The kukui and pig's head are the *kino lau* or forms that the god Lono may take at any given time.

The mobile education center is located right on the beach at Kahaluʻu Bay, and it shares the many special features of the park and the bay with visitors. Before visitors can rent snorkel gear or participate in a snorkel tour, we ask that they view a 7-minute long

reef etiquette video of Kahaluʻu Bay, created by award winning filmmaker Ziggy Livnat. We invite you to view the Kahaluʻu Bay video online at http://forthesea.com/clips/clips-psa.html.

Photo: Visitors watch the educational video before renting snorkel gear.

New staff have been hired and trained to operate the rental concession and the educational center and to support volunteers. Nikki Goodden, TKC's Assistant Outreach and Volunteer Coordinator, oversees the day to day operation of the education center and ReefTeach programs. Maxwell Adams helps with the daily set-up and breakdown of the mobile education center. The education center is open from 9:30 a.m. to 4:30 p.m. every day that Kahaluʻu Beach Park is open.

Photo: Caroline Neary, ReefTeach instructor, trains Konawaena Middle School students about coral reef etiquette and how to be ReefTeachers.

The center is set up with computer equipment which allows students who visit the bay to access our online portal. This portal is set up to allow community members to input data and review trends in the natural resources we are monitoring at the bay, for example: water quality, human use data, and, in the future, coral and fish studies. Student visitors will be able to conduct water quality sampling during their visit and enter their results directly into the computer at the education center. Students will be part of the "learning community" that will work to combine Western science with Native Hawaiian knowledge to sustain Kahaluʻu's land base and its crucial natural resources within an effective, holistic, and informed management/decision-making perspective.

As in all of our work, The Kohala Center encourages communication and respect between scientists and cultural practitioners at Kahaluʻu, encouraging an exchange of information that will increase understanding of natural systems and enhance the health of the *ahupuaʻa* of which the bay is a part.

Photo: Middle school students and their teacher from WHEA counting and monitoring tide pool species abundance in Kahaluʻu Bay.

Our long-term goal is to fulfill the dreams of kūpuna who are now long gone to build a community gathering place in a respectful and reverent way and to take care of the cultural properties at Kahaluʻu. We will need 10 million dollars to realize the vision depicted in the Kahaluʻu Beach Park Master Plan. With the cooperation of landowners adjacent to the Kahaluʻu Beach Park, we expect to build the key elements of the park within the next seven years.

Already we can see the value of the work being done by our ReefTeach volunteers. Community members who swim in the bay have told me that there are more fish now than in the recent past. They report that there are lots and lots of babies, as well as new coral polyps in the bay.

We invite you to get involved by visiting our new Kahaluʻu Bay Education Center, by helping to spread the word about our new education center at Kahaluʻu, and by contributing your time

(http://www.kohalacenter.org/kahaluubay/volunteer.html) or money (http://www.kohalacenter.org/help.html) to help us save Kahaluʻu Bay. Learn more about KBEC at http://www.kohalacenter.org/kahaluubay/about.html.

Small-Scale Solutions

By Alexandra Moore, Director, Cornell EES Field Program

Photo: A future dryland forest at Kaʻūpūlehu.

Our EES students calculate the carbon sequestration capacity of our outplants using standard biomass equations for tropical trees, on a species-by-species and site-specific basis. Our cohort of trees, when they reach their mature size, will sequester more than 2,800 metric tons of carbon dioxide. Each species that we plant plays a role in the restoration of the forest; quick-growing shrubs and vines shade the slower-growing trees and rebuild soil organic matter, helping to boost soil moisture and fertility. Through this process the soil becomes a secondary storage reservoir for carbon. The trees eventually mature and create a closed-canopy forest. As the plants flower and set fruit, seeds fall to the ground, creating a stable seed bank from which the forest will continue to regenerate when the original outplants senesce and die.

We would like to encourage more student groups to think about the carbon footprint arising from their studies. In order to spread our message beyond Hawaiʻi Island, six EES students made a presentation about the Carbon-Neutral Project at the Annual Meeting of the Geological Society of America, held in October 2011 in Minneapolis. The Geological Society of America Annual Meeting is an international gathering of professional Earth scientists, attracting over 6,000 attendees. The EES students were able to meet with peers and professional earth scientists and share the results of their work. Their presentation was well-received, and we look forward to more restoration work in 2012!

Photo: At the Geological Society of America Annual Meeting in Minneapolis. **From left to right:** Nikiforos Delatolas, Professor Alexandra Moore, Meagan Mnich, Jacqui Yost, Liz Ceperley, Robert Levine, and Alex Huth.

> *Presenting our carbon neutral project at the GSA (Geological Society of America) meeting was both an honor and a privilege. Our work was on a much different subject than most of the other presentations, and it was great to have such a unique poster. We not only got the incredible opportunity to present at a major national conference, but also to spread knowledge about the problems that Hawaiʻi faces and certain solutions that can be applied to solve these problems on a small scale. I hope that we reached a wider audience, so that perhaps more people can take on similar projects to lessen mankind's impact on the Earth system.* —Meagan Mnich, Cornell EES 2011 student

An abstract of the students' presentation is available at http://gsa.confex.com/gsa/2011AM/finalprogram/abstract_196407.htm. Learn more about the Cornell EES Field Program at http://www.geo.cornell.edu/hawaii/.

Anyone Can Become a Scientist

By Charlotte Godfrey-Romo, Hilo High School Science Teacher

Photo: West Hawai‘i Explorations Academy (WHEA) Middle School students search for tide pool species at Kahalu‘u Bay to compare their abundance with other West Hawai‘i sites.

I teach three *Plants and Animals in Hawai‘i* classes at Hilo High School. Each class consists of about 25 high school juniors and seniors. My classes have been learning about the structure and function of hard corals and the unique symbiotic relationship between polyp and zooxanthelle that creates the coral reefs. We have been looking at how anthropogenic events are affecting coral and what the implications of damaged reefs mean for the future of Hawai‘i. We have learned about coral bleaching and we will be learning more about coral diseases and their causes.

Through HI-SEES, each of my classes will participate in field excursions to Kapoho to assess different species of corals and their health. Kapoho is a unique place made up of large tide pools that are protected from strong currents. Corals seem to thrive in some of these tide pools, but there are claims and research showing that the sewage systems of the houses from the Kapoho community are leaking into the water table, polluting the reefs and proliferating disease. We will investigate the tide pools at Kapoho to see if we find higher nitrate and phosphate levels closer to the dwellings, and to assess whether the corals closer to the houses appear less healthy than those further away. We will investigate other variables as well, to determine if farming or sedimentation could be contributing to coral health at Kapoho. At the end of our field work, we will apply our knowledge and our findings to draw conclusions about what is happening there.

Each class will be divided into teams of water samplers, photographers, depth/ temperature takers, and transect/quadrat layers. Each class will lay a linear transect out to 100 meters from the first pool (nearest the houses). At each 25 meter mark, small teams will use quadrats to take digital photos and use a color chart to assess the coral in that area. Students will also collect and test water samples at the four locations for temperature, pH, salinity, dissolved oxygen, nitrates, and phosphates.

Photo: WHEA high school students count tide pool species abundance at Kahalu‘u Bay.

There are many useful skills my students will learn in the course of this project, including: team work, communication, data recording, how to use new instruments for measuring water chemistry, how to make field measurements versus lab measurements (dealing with sun, wind, etc.), how to measure using transects and quadrats, and underwater photography. When we bring all of our data back to the classroom, we will be using Google docs programs to create lab reports and presentations and to correlate the data with findings from my other classes.

I also hope that my students will gain a better understanding of how all of the “stuff” we are learning throughout the year applies to the real world. In the beginning of the year when we first define the concept of a “watershed” using a text book, it doesn’t have much meaning. When we go out into nature and become detectives, researching if nitrate levels are higher than they should be, my students use their own reasoning skills to link together what they

are learning about, to create possible scenarios, to analyze what their own data shows, and to draw reasonable conclusions. After this hands-on experience, they will have developed their own understanding of what "watershed" means. Many of the concepts we study in science class seem intangible to students until they can go out into the world to see, hear, smell, and touch things for themselves. What I live for as a teacher is when my students have these "Aha!" moments and they come to me loaded with new questions that show they are thinking deeply.

Photo: Ke Kula ʻo ʻEhunuikaimalino students collecting water samples from one of the ponds near Kahaluʻu Bay.

Most of my students show a great respect for the *ʻāina*, and I believe this field experience will give them a greater respect for what a special place Kapoho is and inspire them to want to protect it for the future. I also hope my students will see that they can become scientists. I believe that anyone can become a scientist, as long as they have passion and a strong work ethic. I want them to see what a noble profession science can be, while also being fun and exciting. I hope to infect my students with the passion I feel about science and coral reefs, so that they can see themselves as potential field scientists.

The Kohala Center is assisting with this study by providing guest scientists to present relevant background material and assist the students with designing their research projects. The digital cameras, tape measures, and quadrat supplies we'll use are being purchased with a mini-grant from The Kohala Center. These supplies will be available to serve future Hilo High School students for years to come. The students will also be borrowing probes and kits for water sampling from TKC. The Center will be arranging and paying for transportation for our excursions to Kapoho, which is usually the biggest barrier that prevents teachers from taking students out into the field to conduct research. The majority of my students are from economically challenged homes. Hilo High School has faced many budget cuts this year, and The Kohala Center's financial help is needed more than ever to support field-based science learning for my students.

Learn more about HI-SEES at http://www.kohalacenter.org/hisees/about.html.

A Culture Encoded in Language

Story, Photos, and Captions by Larry Kimura, Mellon-Hawaiʻi Doctoral Fellow

Photo: My mother (Elizabeth Lindsey) on the left and my aunt (Helen Lindsey) on the right are seen here dressed as male dancers. The students were performing a Spanish cultural dance in honor of May Day at the Waimea School grounds. The Waimea Elementary School building, circa 1934–1935, is in the background.

I went to Waimea Elementary and Intermediate School, the public school in my hometown of Waimea, South Kohala. Like me, many of my teachers were born and raised in that community and they taught several generations of Waimea's children. The old school building has now been moved and converted into an art gallery in Waimea (I'm glad it's been saved). Back then it consisted of six classrooms, from grade one to six, lined up in a

row with a long lānai extending down the length of the building. Many generations of Waimea people went to this school, including my own parents. Going to school there gave me a sense of belonging to the community and to our local culture. Of course the community of Waimea in the 1940's and 50's is not the Waimea that it is now.

I entered the Kamehameha School for Boys at Kapālama, Oʻahu, as a boarder in the eighth grade. Once again, boarding and school life at Kamehameha now is not what I and all of my siblings experienced completing our intermediate and high school education there. Besides furthering our education, my parents wanted us to experience the world beyond our rural community of Waimea, and Kamehameha School on Oʻahu provided that opportunity.

Photo: Me and my brother Lester **(in back of me)** at Puhihale corral in Waimea, playing cowboy while watching one of the Parker Ranch branding events taking place there. My brother and I are about one year apart so we may have been around 8 and 7 years old.

I feel lucky that from an early age my Hawaiian identity was a major area of concern for me. I say fortunate, because being exposed to both Japanese language and culture on my father's side and the Hawaiian on my mother's side of the family, implanted within me the question as to why the overwhelming effort was (and still is today) to be a member of mainstream Western culture. As children we grew up hearing both Japanese and Hawaiian, but we were never spoken to in either. We were simply told English was the language to know in order to be successful in our lives. I think I favored my Hawaiian side knowing that it belonged here to this homeland in Hawaiʻi. Growing up in Waimea, I experienced only the remnants of this understanding through the lives of my Hawaiian grandparents' generation, who lived every day of their lives communicating in the Hawaiian language. For me, that is the essence of being Hawaiian.

Going to a "Hawaiian" school at Kamehameha, I looked for opportunities to confirm my Hawaiian concerns. I hid my uneasiness because being interested in anything Hawaiian back then was definitely not something one would talk about freely. Kamehameha provided an immediate immersion into the philosophy of Western education, something that my parents very much supported. However, Kamehameha could not replace the identity I was raised with and grew up in. In the eighth grade, my first year at Kamehameha, I was exposed to a short course in Hawaiian language taught by a native speaker of Hawaiian who was a retired public school teacher. I nearly flunked that class because I did not appreciate the cursory approach to the content. Though I was not a speaker of Hawaiian, my understanding of the language through my own Hawaiian speaking grandparents' generation left me feeling that the language deserved to be taught much better than this.

Photo: My grandfather, John Kawānanakoa Lindsey.

It was just by luck that during my last three years of high school, Kamehameha offered Hawaiian language as an elective. I think the Boys' School Principal, Colonel Harold Kent, had an interest in Hawaiian, and that interest was further encouraged when he attended a University of Hawaiʻi summer workshop in 1961 that introduced a new approach to foreign language teaching developed by the Army, called the audio-lingual method. Basically, this technique utilized a native speaker model in a language laboratory mode. Linguist Dr. Samuel Elbert of the UH Mānoa campus was asked to find a Hawaiian native speaker to demonstrate this new method of foreign language instruction. He convinced Mrs. Dorothy Kahananui, a professor of music at UH Mānoa who had just retired that summer, to be that native Hawaiian speaker. Initially, Mrs.

Kahananui was apprehensive about her native Hawaiian speaking ability because she had taught music all her life and her involvement with the language was limited. But eventually she consented.

By the end of the summer workshop, Colonel Kent had convinced Dorothy Kahananui to teach Hawaiian at the Kamehameha Boys' campus in the fall of 1961. She was also asked to develop a high school Hawaiian language textbook as one product of her teaching. I was in my sophomore year when her Hawaiian language class was offered as an elective; it was the first co-ed course ever offered at the Boys' School. Fortunately, I had a free period during that class time and was anxious to see how the content would be taught. The girls who signed up were bused from their campus to Keoua Hall and the classroom was filled to the brim, with the girls all sitting at the front of the room and the guys at the back.

Then in walked this senior Hawaiian woman, hair rolled up tight in a Gibson hairstyle, of thin build and body straight as a board, with eyes looking directly ahead. By the end of the week, not more than ten boys and girls remained. I persisted because I was immediately taken by the seriousness given to Hawaiian by Mrs. Kahananui, and I could relate to the expressive language she taught that I grew up hearing. Mrs. Kahananui completed the draft of her textbook within three years and left the school the same year I graduated from Kamehameha.

Photo: My grandmother, Eliza Purdy Lindsey.

I learned Hawaiian from Dorothy Kahananui so that I could correspond in Hawaiian with my grandmother at my second year level. By the end of my third year I could begin to speak to my Hawaiian grandmother, grandaunts and granduncles at home. My grandparents' generation helped me to become more comfortable speaking in Hawaiian and, fortunately, my grandmother, Mrs. Eliza Purdy Lindsey, lived until I was a sophomore in college. I also learned from numerous other native Hawaiian speakers, mostly in their senior years, whom I came to know over the years, especially one of my own uncles, Joseph Wenuke Makaʻai. He was a native Hawaiian speaker, born at Puʻuanahulu and raised in Kaʻūpūlehu, North Kona, who lived with me for twenty-five years until his passing.

I think in my high school year book I said that I wanted to pursue my interests in Polynesian anthropology because I knew there was not a single tertiary degree program in Hawaiian culture. I enrolled at the University of Hawaiʻi at Hilo on my home island, which was then only a two-year campus, and Hawaiian offerings were non-existent. This gave me more time with my Hawaiian speaking grandmother, and I also began to engage with other native Hawaiian speaking kūpuna to improve on my Hawaiian fluency and gain further knowledge of the culture. These native speakers were really my mentors and inspiration during those early years at college.

In the summers I tried to find jobs that afforded me some connection to the Hawaiian language and culture. When I inquired about a possible job at the City of Refuge National Park at Hōnaunau in Kona and said that I knew a little Hawaiian language, the Superintendent Russell Apple immediately said he had a job for me. As it turned out that first summer I worked with the maintenance crew, but Mr. Apple made me teach all of his employees Hawaiian for an hour a day even though some of the employees had grown up speaking Hawaiian. The following summer I got to be a park interpreter. Living at Hōnaunau provided me opportunities to meet with more native Hawaiian speakers from the Kona area.

Photo: Me, conducting my Hawaiian language radio program, *Ka Leo Hawai ʻi*, on KCCN radio in Waikīkī with my student at that time, Pila Wilson, and my Uncle Joseph Maka ʻai in the foreground, who was my guest interviewee forthat evening. I conducted this program for 16 years from 1972–1989, when I did the bulk of my documenting of Hawai ʻi'slast native Hawaiian speakers.

I completed my bachelor's degree in anthropology by transferring to the UH Mānoa campus. My high school teacher, Dorothy Kahananui, became a part-time Hawaiian language teacher there, where she pursued language teaching methods and completed a second Hawaiian language text book. I took a Hawaiian language course with her, as well as one with Mr. Lordie Kaʻulili and Dr. Samuel Elbert. I was fortunate for a few semesters to work part-time with the Hawaiian language audio collection of the Bishop Museum, where I helped to coordinate a three-day recording field trip with Mrs. Mary Pūkuʻi to tape Hawaiian speaking elders on Hawaiʻi Island.

I had already come to know Mrs. Pūkuʻi when in high school. Mrs. Kahananui incorporated listening to native Hawaiian conversation into her high school language classes, using a Bishop Museum recorded interview done by Mrs. Pūkuʻi with another Hawaiian speaker. I decided that I would ask Mrs. Pūkuʻi if she would tape record my grandmother when she came to Honolulu for my high school graduation, which she graciously agreed to do in 1964. From that time forward, Mrs. Pūkuʻi was generous, in spite of her busy schedule, in responding to my inquiries about anything Hawaiian. Hawaiʻi should never forget the monumental work done by Mrs. Pūkuʻi and others of her generation in the field of Hawaiian language and culture.

The Vietnam War was still going on in the late 1960's, so immediately after completing my bachelor's in anthropology I was drafted into the Army. To make a long story short, after basic training in California I was sent for training in New Jersey and New York to be a chaplain's assistant, and instead of being sent to Vietnam for my tour of duty I was fortunate to be sent to Frankfurt, Germany. Being in the Army gave me a chance to experience some of the continental United States for the first time. While in Germany I tried to learn enough of the German language to help me get around not only in Germany but also in other European countries that I visited. This gave me a chance to experience living in a country culturally and linguistically different from the U.S.

Photo: Me and fellow office workers in the Headquarters Office of the Fifth Corps, U.S. Army, Frankfurt, Germany.

When I was offered an instructor's position at the UH Mānoa in 1971 after being discharged from the Army, Hawaiian was still considered a foreign language and students interested in Hawaiian were funneled through the College of Liberal Studies for their baccalaureate degrees. Hawaiian language was offered through the Indo-Pacific Languages Department along with Tamil, Burmese, Vietnamese, Sanskrit, Tagalog, and other Asian-Pacific languages. A reawakening in things Hawaiian started in the late 1960's with the eviction of several Hawaiian farmers from the Kalama Valley area to make room for urban sprawl. The emergence of young Hawaiian musicians at that time also contributed to the Hawaiian Renaissance that later also included the renewal of traditional open

ocean voyaging, the stopping of the Navy's use of Kahoʻolawe, and various Hawaiian initiatives that were approved through the State Constitutional Convention in 1978. This resurgence of Hawaiian interests in the community supported the development of the Hawaiian discipline at the university level.

Photo: Tom Myrdahl, photographer, Samuel Liʻa Kalāinaina (known popularly as Sam Liʻa) of Kukuihaele-Waipiʻo, and me, working on documenting his work as a renowned Hawaiian song composer. Sam was 93 years old then. Since we could not get funding for a video or film production, we had to settle for a slide show done under the auspices of the Hawaiʻi Multi-Cultural Center and the University of Hawaiʻi's Committee for the Preservation of Hawaiian Language and Culture. This photo was taken in 1973 before Eddie Kamae met Sam and delved into his own film entitled *Sam Liʻa*.

In 1979 a Hawaiian Studies program was established at the UH Mānoa campus and the first B.A. degrees in Hawaiian were awarded in the spring of 1980. The Hawaiian Studies B.A. degree at the UH Hilo campus was initiated in 1982. Finally in 1986, through the long-range recommendations presented through the University of Hawaiʻi's Kaʻū Task Force Report, direction was given for the Hilo campus to pursue the progression of programs for Hawaiian language while Mānoa would focus on Hawaiian history and political science, not to the exclusion of any of these disciplines at either campus. Hilo took the lead in Hawaiian language instruction through its Humanities Department within the College of Arts and Sciences, eventually leading to the establishment of the College of Hawaiian Language with a fully developed undergraduate degree program and a graduate program at the doctoral level.

Being a tenured faculty member in the University of Hawaiʻi system presented the biggest hurdle for me to become one of the first candidates of the only Doctor of Philosophy Program in the world for Hawaiian and Indigenous Language and Cultural Revitalization. Institutionalizing the very first graduate Master and Ph.D. programs at the UH Hilo campus presented many challenges, especially under the umbrella of the flagship campus at Mānoa. Finally an acceptable path was endorsed, and the first cohort of five Ph.D. candidates in Hawaiian and Indigenous Language and Culture Revitalization began their two-year program of course requirements in 2007.

Pursuing a doctorate degree for me now is timely. I see life for the Hawaiian language in the analysis of its imminent death. This is the most interesting aspect of my research thesis, *An Analysis of the Terminal Language of the Native Hawaiian Speaker: A Comparison of the Native Language of Two Generations, the Standard Language of the Parent and the Persistent Language of the Offspring*.

Successful formal education through the medium of Hawaiian language is a discipline initiated some thirty years ago. However, besides maintaining a philosophy and application of effective education, Hawaiian medium education is crucially linked to a larger engagement of regenerating a language and culture from the brink of extinction.

Photo: The 2001 Hōkū Hanohano Hawaiian Music Awards event. We (ʻAha Pūnana Leo staff members at that time and myself a ʻAPL Board Member) are holding some Hōkū awards presented to a ʻAha Pūnana Leo sponsored CD Hawaiian music project with original music composed and sung by some Niʻihau families. Seated is Malaki Kanahele and the older woman in white in between two other females is Annie Kanahele, the composer of most of the original songs on the CD, Nā Hīmeni Hoʻomaikaʻi I Ke Akua. Malaki, Annie, and the two other females in white are from Niʻihau.

Focus in second language acquisition commonly emphasizes a standard register of language use and not the informal, conversational level, which has its own challenges in comparison

to standard Hawaiian. The results of my research will sensitize language instruction to the informal register of language use and help to further refine distinctions of language levels to accommodate a more holistic approach for Hawaiian proficiency.

For Hawai‘i, Hawaiian medium education is proving to be the most successful approach in the journey for Hawaiian language normalization. It is from this core of second language learners that new first language speakers will emerge to address the path of a renewed life for the Hawaiian language and culture. Perhaps most people know that one's own language identity begins at home, and, therefore, parents who have become fluent as second language speakers of Hawaiian can raise their children from birth and beyond only in Hawaiian—thereby giving a precious gift and setting a precedent for their child's journey in life. New cycles of first-generation Hawaiian language speaking children from fluent second Hawaiian language speaking parents have already begun.

Therefore, it is vital that more be done to create proficient second language speakers in order to regenerate first language speakers from the home environment. These first language speakers can then assume viable places in the community, so that Hawaiian can once again become a normal language of the larger society.

I think many adults find it very difficult to see Hawaiian as part of Hawai‘i's society, even as we have become more aware of other countries living happy healthy lives with more than one official language. If these adults happen to be parents of young children in a Hawaiian immersion school, however, the seed of possibility that the Hawaiian language can once again be an integral part of Hawai‘i makes this potential real. To appease the great anxiety about learning English, Western education should consider other countries in the world that have already proven that English is better mastered through an educational process which implants the learning of more than one language.

My grandparents’ generation lived their daily lives through their own Hawaiian language. They used Hawaiian to express what was going on in their immediate and extended worlds, just as much as any other native language speakers do today. The cattle industry was at the core of Waimea, South Kohala, where my grandfather was the head cowboy foreman for the Parker Ranch from 1903 to his death in 1947. Hawaiian language and culture connected him to his twelve siblings, his cousins, aunts, uncles, to his parents, and grandparents. My grandfather lived under three of Hawai‘i’s last Sovereigns. He lived under Hawai‘i’s Provisional Government, the Republic of Hawai‘i, and the Territory of Hawai‘i. Throughout his life, Hawaiian was his language of identity, spoken every day, at home, work, and wherever he went. His language framed and put into perspective what he engaged in as a Hawaiian, no matter what the situation.

I think when people ask how language is related to the culture, they are thinking of traditional things such as chants, folklore, traditional religious practices, etc. All languages and cultures of the world have a register to embody such information. A culture is encoded in its own language, and that language serves as its vehicle to continue certain patterns of behaving, believing, comprehending, affecting change, flourishing, and evolving. To end such a code of being is to end its language.

Photo: Me talking in Hawaiian with of one of our children at the Pūnana Leo o Kamakau preschool at Kailua, O‘ahu, about a gift that a visitor from Peru gave to the school. I helped to direct a field trip with various indigenous people from around the world who were a part of the World Forum on Early Childhood Education Conference that was held in May 2011.

To be a member of the first cohort of doctorate candidates at UH Hilo is a milestone for me, marking over forty years on this path that we—colleagues, chancellors, governors, members of our communities, kūpuna and families, legislators, supporters from national and international places, students, and mentors who came

before—helped to create. Pursuing an official Ph.D. degree enables me to increase my knowledge in my discipline and contribute to furthering the progress of the College's short- and long-term goals.

I do not know of any other fellowship that specifically supports Hawaiian doctorate and post-doctorate scholars whose research focuses on native Hawaiian issues. Anyone getting involved with Hawaiian concerns can easily get bogged down with so much to do. The Mellon-Hawai‘i Fellowship offers a privileged and crucial space in time to complete the highest degree awarded by a graduate school. This fellowship is indeed a significant honor for anyone to receive, especially as the application process becomes increasingly competitive, with a growing number of applicants and limited fellowships awarded.

At the end of my fellowship, I will return to my commitment to assist the families of the ʻAha Pūnana Leo program and to my role as a member of the Hawaiian Culture Committee Kahu Kū Mauna of the Mauna kea Management Office. We are constantly presented with a wide range of matters affecting Hawaiian cultural concerns, both indirectly and directly. I will also return to my faculty position at the College of Hawaiian Language, to work in consortium with the ʻImiloa Astronomy Center, our Hawaiian immersion laboratory schools, and ʻAha Pūnana Leo, to construct a new building dedicated to the work of the College. This long awaited building will allow us to expand our class scheduling options, in order to offer more intense and immersive learning for our students. Putting new programs and activities in place will bring us closer to “mauli ola,” a living and thriving Hawaiian identity through the essence of our own language.

Hawaiian language revitalization has become my life's work. I see myself becoming a mentor of future graduate students in my field. I will continue to research and document Hawaiian information and strive to make such information more accessible for future learners. I also see myself participating further with other indigenous language and cultural revitalization efforts throughout the nation and the world.

School Garden Grantees

Photo: Waimea Middle School students harvest sweet potatoes from Malaʻai Garden.

Recipients of The Kohala Center’s 2011–2012 Hawai‘i Island School Garden Network (HISGN) matching grants are

- Chiefess Kapiolani Elementary School
- Honaunau Elementary School
- Honokaʻa Elementary School
- Honokaʻa High School
- HPA Lower School
- Hua O Ke Ao/Amy Greenwell Garden Youth Agriculture Program
- Hualalai Academy
- Innovations Public Charter School
- Kalanianaole Elementary and Intermediate School
- Ke Kula ʻO ʻEhunuikaimalino
- Kohala Elementary School
- Malaʻai Culinary Garden at Waimea Middle School
- Na Kahamoku - Kealakehe Middle School
- Parker Middle and High School
- Paʻauilo Elementary and Intermediate School
- Waimea Country School

Photo: A Waimea Middle School student weaves a ti leaf lei.

Hoa ʻAina O Makaha on Oʻahu was awarded a grant for their partnership with HISGN in hosting the 2011 Summer School Garden Teacher's Conference, "Planting Hope: Growing the Next Generation." An HISGN grant was also awarded to Dr. Corilee Waters at University of Hawaiʻi at Mānoa, to create middle school curriculum to connect STEM (science, technology, engineering, and mathematics) and nutrition education through garden-based lessons.

HISGN began in January 2008 and offers professional development for school garden teachers, individualized consulting for specific school garden projects, curriculum development, volunteer recruitment, identification of funding opportunities, and local agricultural resources. Sixty Hawaiʻi Island schools are now part of the network, including public, private, and charter schools which serve students in grades K–12. Participating schools are committed to using school gardens as settings to provide hands-on learning experiences for all grade levels, foster healthy lifestyle choices, and promote environmental stewardship. The goal of HISGN is to help island schools build gardening and agricultural programs that will significantly contribute to the increased consumption of locally produced food—by involving students, their school communities, and family networks in food production. These programs also give students hands-on learning experiences which are engaging and relevant, and thereby support their academic achievement.

Photo: Waimea Middle School students collect blue corn seeds from Malaʻai Garden.

"School gardens reconnect our children and youth to the source of their food, expand their nutritional knowledge, and increase their environmental literacy," says Nancy Redfeather, coordinator of HISGN. "HISGN is helping island schools to become centers for food production and for educational opportunities that serve our school communities and beyond."

Support for the HISGN school grants program comes from the Ulupono Initiative (www.uluponoinitiative.com), a Hawaiʻi-focused social investment organization. HISGN welcomes public contributions in the form of funding, sharing of resources, and volunteering time at one of the school gardens. Visit www.kohalacenter.org/HISGN for more information.

Compassion for Living Things

Photo: WHEA 10th grader Kristina Hamilton setting up the irrigation system for a pumpkin project in which she experimented with the effectiveness of mulch.

At the beginning of each year, West Hawai‘i Explorations Academy (WHEA) High School students attend workshops in which they learn about potential projects they can participate in. These workshops help students develop skills to start independent or group marine, engineering, and gardening projects. After a month of intensive workshops, students spend about half their day in traditional classes, with the rest of the day designated for students to work on their science projects.

Four WHEA High School teachers serve as primary project advisors for students who are doing gardening projects. These teacher advisors help students develop their project ideas and give them guidance as they execute their projects. Because of the school's location at the hot and dry NELHA site, gardening projects have a mix of challenges, as well as NELHA resources, that are unique to WHEA.

Photo: WHEA teacher Ben Duke talks to 10th grader Danielle Hathaway about her project, in which she is experimenting with the effect of different mulches on tomato growth rate.

> *It's great being part of a team where I can help students create learning opportunities for themselves based on their interests. Watching students' enthusiasm grow as they learn how to grow their own food is a great experience. As students gain agricultural skills, Hawai‘i Island can become more self-sufficient and sustain and nourish its population, while protecting its natural beauty.*
> —Ben Duke,WHEA High School teacher and garden advisor

Photo: WHEA 11th graders Ricky Bailey, Braxston Bailey, Keoni Smith, and Kyle Kirk add soil to a bed that will be used for an experiment involving deep ocean water piped through the soil.

One objective of the gardening/agriculture projects is simply to expose students to working with plants. Students also gain an intimate knowledge of the scientific method as they develop a problem statement and hypothesis, conduct an experiment, collect and analyze data, and draw conclusions. Students learn about natural cycles as they create a living system. Further, as they write topic papers and lab reports, they develop their writing and reading/researching skills. WHEA students strengthen their oral communication skills when they present the results of their science projects to over 1,000 elementary students who visit West Hawai‘i Explorations Academy each year as part of the school's *Aloha Kai* tours.

Photo: 11th grader Parker Boekmann presenting the aquaponics system he helped build to elementary students visiting WHEA.

> *I have learned a lot about gardening that I did not know before high school. I have never been much of a gardener, so simple things like how to plant plants, how much water is needed, and where to plant them was new information to me. The things that I've learned will help me not only during the rest of my time at WHEA but in any gardening that I might pursue.* —Aaron Ventimiglia, senior at WHEA

Students harvest vegetables from the school's hydroponic and aquaponics systems and they learn how to cook these fresh veggies. Excess vegetables are sent home with students to be enjoyed with their families. Teacher-led workshops show students how to make salsa and pesto using the plants they have grown. Students view contemporary films such as *Food, Inc.* and *The Future of Food* to learn about issues such as genetically modified food. Students involved with gardening projects also take field trips to farms around the island.

"Given that the Big Island imports approximately 90% of its food, current and future generations have been tasked with developing on-island agricultural projects to make the island more self-sufficient," explains Ben Duke. "As part of their gardening projects, our students learn about where their food comes from, how to prepare fresh produce, and how they feel after eating fresh vegetables," Duke says.

Photo: WHEA 11th graders Gabby Desimone, Morgan Taylor, and Emi Sundberg prepare a bed in which they will plant medicinal plants.

Each project has a mentor from the community. Through their mentors, WHEA students draw upon the expertise of The Kohala Center's Hawai'i Island School Garden Network, the Kona Outdoor Circle, 'Ohana Greenhouse, Friendly Aquaponics, Coastview Aquaponics, Dew Point Systems, One-Island Sustainability Center, and the University of Hawai'i's College of Tropical Agriculture. Mentors give students feedback on the experimental design of their projects and help students troubleshoot problems that arise in the course of their projects.

> *I've learned about allelopathic plants, like sweet potatoes, and how they inhibit the germination and growth of certain plants. I've also found out that plants have unique features and that certain plants prefer certain environments. Strawberries love cold acidic soil but lots of hot sunshine. I'm now interested in plants and in the ways you can manipulate them in order to have the best results. I like gardening projects because even though they are hard work in the beginning, in the end, you feel as if you have accomplished something and you get to eat whatever you grew.* —Aron Risley, junior at WHEA

Photo: WHEA 11th grader Justin Sargeant planting *kalo* in a garden which gets flooded by water that drains from a sink.

The WHEA Middle School's Ethnic Gardens were founded in 2008, with the aim of making students more aware of their diverse ethnic backgrounds. Students implement the concepts of permaculture as farmers of their own group plots. Under the guidance and mentorship of teachers and community experts, students apply the ideas of recycling, reusing, and renewing to the production of food in their school garden. Students design and build their garden plots, using ecologically sound

methods such as heavy mulching, trellising/companion planting and using bio-waste products from neighboring mari-culture businesses at NELHA (such as fish-waste, abalone shells, and algae) to make their own fertilizer. They also attempt to recapture water from air with devices such as solar stills, catchment tanks, and simple condensate chillers utilizing the school's access to cold sea water, to supplement use of county water. Students use simple photovoltaic devices, such as home-made solar cookers, and other off-grid technologies and techniques to help with irrigation and processing of food grown in the gardens.

Photo: WHEA Middle School teachers wear lots of hats. Sara Medeiros teaches math, science, engineering, cooking, and drama. All teachers at WHEA incorporate hands-on learning, but "nothing beats getting your hands dirty and scratched and bruised in your very own garden," says Medeiros. Here, Medeiros is helping students in the Northern European garden group.

"Our middle school students are excited about growing food," says WHEA Middle School teacher Sara Medeiros. "They tell their parents about what they have learned and share some of the produce that makes its way home. The Ethnic Gardens, especially, provide a jumping-off-point for students to discuss their ancestry with their parents," Medeiros says. Medeiros shared the following quotes from her 6th grade students:

> *I chose the Americas garden because my ancestry is from Mexico. I like to feel that proud feeling when a plant grows.* —Gigi
>
> *I picked the Africa garden. It's great because you learn how to help save the Earth.* —Alana
>
> *Our Polynesian garden is doing very well. We have taro, bananas, gourds, sweet potatoes, papayas and lilikoi. We work together to make our garden stay healthy.* —Shione
>
> *I like the garden because you get to work together and learn to cooperate with others.* —Calvin
>
> *Our melons are really popping out, and some beans have just started to peep up.* —Crystal

Photo: WHEA's *Eat Local* Market.

WHEA's *Eat Local* Project was created in the 2010–2011 school year to promote sustainability and healthy eating. The goal is to show kids that everyone has the power to grow their own food no matter how large or small their homes are. As part of this project, WHEA Middle School students grow vegetables and herbs, such as squash, tomatoes, and basil. Each student has his/her own garden space, and they choose which plants to grow. Every day the students are responsible for tending their garden plot, and they also research and learn about various gardening techniques.

> *I love being a garden teacher and have had many home gardens. I have as much fun as the kids because it is a beautiful thing to plant seeds in the soil one day and then pick and enjoy another day. I know a project of mine is going well when students are working on it before, after, and during lunch—which is exactly what many of my Eat Local students do. Eat Local has brought a lot of pride in ownership and enjoyment to my students.* —Joel Kriner, WHEA Middle School Teacher

Photo: WHEA 9th grader Daniel Manzo and 11th grader Kari Sochor collect lettuce seeds from last year's plants. The seeds were stored and will be used later this year.

Another major goal of the *Eat Local* project is to serve as a community resource. WHEA hosts a *Eat Local* Market approximately ten times per year, which gives students the opportunity to sell their produce to WHEA parents, students, and staff. The middle school also participates in the Public Good project. Last year, students built by hand and donated wooden gardens beds to local non-profit organizations. The donated beds included soil and starter plants which can be enjoyed for many years to come.

WHEA is faced with an uncertain future due to the expansion of the Kona Airport. To learn more about the school's capital campaign to relocate its campus or to make a donation, please visit www.explorationfound.org/. Throughout the year the school welcomes donations of starter plants, garden supplies, tools, and financial support. WHEA also invites community members who would like to teach 45-minute vegetable garden workshops to contact Joel Kriner at kriner@whea.net.

Click on these links to view WHEA photo journals that the students use to document their work: http://eatlocal101.blogspot.com/, http://gotsalsa.blogspot.com/, or http://eatlocalplantsskylerbailee.blogspot.com/.