SENCERizing Classes for Sustainability with a Sensitivity for Traditional Hawaiian Values and Knowledge

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What is the Pacific Center for Environmental Studies?

- Founded in 2004 and housed within the Department of Natural Sciences, the Pacific Center for Environmental Studies (PaCES) encourages and supports environmental science education and research at Windward Community College - training the stewards of tomorrow.
Understanding the functioning of ecosystems and human influences on them

Viewing humans as functional components of ecosystems from historical, cultural and social, as well as scientific, perspectives

Recognizing that the quality of human life is dependent upon the quality of our environment and our ability to sustain our humanity within this environment
Promoting stewardship through wise and thoughtful management of our environment and natural resources, looking to traditional practices and promising technologies of the future.

Embracing *ahupuaʻa* as a symbol for sustainability and positive human interaction with the environment.
STEM Literacy
Undergraduate Environmental Education and Research
Undergraduate Environmental Education and Research
Service and Stewardship
Community Outreach
The Pacific Center for Environmental Studies and Hawai‘i Institute of Marine Biology High School Summer Program in Environmental Science
AQUA 201 The Hawaiian Fishpond

- An introduction into the history, development, biology and ecology, management, restoration, and future of Hawaiian fishponds. This course will study traditional Hawaiian fishponds, merging traditional knowledge with the principles of modern Western science.
AQUA 201L The Hawaiian Fishpond Laboratory

Companion laboratory class to AQUA 201, The Hawaiian Fishpond. This class provides hands-on experiences studying Hawaiian fishponds, their construction and operation, oceanography, biology, ecology, and restoration.
AQUA 201/201L Content

- science as a way of knowing
- fishpond types and technology
- water quality
- basic ecological principles
AQUA 201/201L Content

fishpond life

Hawaiian fish nomenclature

Melichthys vidua
pinktail durgon
humuhumu hi’u kole

aquaculture principles
AQUA 201/201L Content

- **archaeology**
- fishpond legends
- the ahupuaʻa
AQUA 201/201L Content

protocol

stewardship
BIOL 200L Coral Reef Laboratory and Field Studies

- Laboratory and field studies of the biology, ecology and geology of stony corals and the reef structures they build; companion course to BIOL 200.
BIOL 200L Content

Waikiki Aquarium

reef surveying

HIMB tour
BIOL 200L Content

Waiheʻe water tunnel

fishpond studies
A four-day field course on the island of Hawai‘i. A survey of Hawaiian volcanic processes is illustrated by studying Kilauea, Mauna Kea, Mauna Loa, Hualalai, and Kohala volcanoes.
GG 211 Content
HUI O MOKU
University of Hawai‘i at Mānoa Team

ULLA HASAGER,
REZA GHORBANI,
OCEANA FRANCIS

KANALOA SCHRADER,
NELSON IKAIKA FERNANDEZ
The Hawaiian saying, Ka wā mamua, ka wā mahope, reminds us of the importance of lessons from past imbedded in cultural knowledge to understand the present and plan for the future.

It is today imperative for the future of human survival that we educate ourselves and transform our lifestyle to preserve resources. This cultural-environmental concern is reinforced by economic and social concerns. We have a responsibility to integrate our cultural knowledge and scientific understandings with active participation in our public policy.

In improving scientific knowledge and communication about STEM topics and issues with the public – ultimately a matter of survival of humanity, social sciences play a key role. This includes such complexes of issues as human rights (addressing inequality in access to resources and knowledge), ethnic inequality, sustainability and climate change.

Scientific knowledge is important for policy solutions, but this will only work, if our workforce with a scientific background has a high level of civic responsibility and engagement.

We must work with our communities to strengthen knowledge and skills in science, technology, and math, as well as in the understanding of the social and cultural contexts and political and economic implications of scientifically based decisions.

We must continue to maintain and further develop engaged scholarship and its academic and institutional foundation, and contribute to revitalization of our local communities and environment in Hawai‘i through the utilization of academic and human capital.
Civic engagement at the intersection of natural and social sciences

... promotes SENCER principles grounded in traditional Hawaiian values such as

- kuleana (responsibility/civic engagement),
- ‘ohana (family/community), and
- ahupua’a (traditional land division, environment, sustainability).

Central to implementing these efforts are community engagement and cooperation, including service learning and teaching to important social issues.

COMPONENTS

- community collaboration
- course development and implementation (examples from ethnic studies, anthropology)
- assessment
- institutionalization
- faculty development

SOME INITIATIVES promoting STEM, sustainability, inter-ethnic relations, and general civic engagement

- Participation of Kaimukī High School students in the Waves of Change Climate Change Conference, April 4-6, 2013 at UHM (focus on the Pacific and Hawai‘i);
- Ka Holo Wa‘a: teaching STEM topics, sustainability, cultural values and respect through traditional voyaging practices to Native Hawaiian and other Pacific Islander students.
- Exploring My Backyard and Beyond, Summer program

EXAMPLES OF COMPLEX, LONG-TIME SERVICE-LEARNING PROGRAMS

- Mālama I Nā Ahupua’a Program (cultural environmental program) and the
- Pālolo Pipeline Program (educational pipeline for low-income, immigrant community)
- No Mo’ Haus’
- Micronesia Connections
MINA - Mālama I Nā Ahupuaʻa

2012-2013
What is MINA?

Who We Are- Mālama i nā Ahupua‘a "(formerly: Adopt an Ahupua‘a)" is a service learning program organized and run by instructors with the help of student coordinators and community partners.

What We Do- The Mālama i nā Ahupua‘a service-learning program integrates cultural, historic and environmental learning. We help with restoration, maintenance, documentation, and oral history collection. The program works with a number of community partners and sites. We aim to develop a “sense of place” by creating a fund of knowledge and practical experience.
A Lesson in Sustainability for the Future
I ka Wā Mamua, ka Wā Mahope

Mālama I Na Ahupuaʻa Service-Learning Program

Who we are...
Natural sciences and social sciences faculty and students from different institutions engaging students and faculty in interdisciplinary community research and service learning to support environmental responsibility as well as cultural, social, & scientific skills for sustainable future uses of island resources.

Why we serve...
Our island environment is threatened by misuse and exploitation for economic gain and political self-advancement.

It is urgent to educate the people of Hawaiʻi, to take responsibility and action to preserve and sustain our natural resources.

We aim to develop a “sense of place” by creating a fund of knowledge and practical experience.

We establish a shared base of knowledge through common meetings & activities from which students build a mālama ʻāina awareness, civic responsibility, and sustain natural resources in the ecosystems of Hawaiʻi

Where we learn...
- Bishop Museum - Diamond Head State Park - Foster Botanical Gardens -
- Hālawa Valley Heiau – Hawaiʻi Nature Center – Heʻeia Loko ʻIa -
- Honolulu Zoo - Kahana Valley - Kalili Valley Nature Center -
- Kapapa Loʻi o Kanewai - Leahi Hospital Sensory/Sustainability Garden -
- Lyon Arboretum - Mākuʻa Valley - Mokaua Island - Waipao -
- Oneula Beach in ‘Ewa - Sea Life Park - Ulupō Loʻi & Heiau -
- Waikalua Loko ʻIa - Waikiki Aquarium - Maunalua -

“...the concept of the ahupua’a symbolizes the soul of the Hawaiians. It is a right of heritage centered on respect for land & the ocean.”
...Verna Akina of BOT 130, KCC

“...the idea of the ahupua’a is also a traditional division of land that extends from the mountain out into the ocean to the reef.”
...Kanoelani Steward Marine Science, KCC

“...I enjoyed working in the Mānele Garden. It was a pleasant environment and working experience. Aside from cleaning the malo‘a, I got to learn names of a few of the Hawaiian plants & its uses...”
...Allison Flinn BOT 101, KCC

“...As a marine science student, MINA showed me that everything that affects the land has a direct impact on the ocean & that Native Hawaiians truly cared about their surroundings as the environment continued to provide for them...”
...Kanoelani Steward Marine Science, KCC

“I was a member of this SL project & found that learning can be fun, especially getting mud in between your toes & sand in your hair, all for the sake of perpetuating the lifestyle of sharing & caring for the land we live on. Mālama i ka ʻāina.”
...Brendan Buchwach BOT 105, KCC

“It was hard work but it’s work worth doing. I’m learning about the techniques & values of my ancestors as well as beautifying the campus for others to enjoy.”
...Joey Salazar, UHM & KCC

“I learned through SL how delicate the balance of the ecosystem is. The seemingly harmless act of introducing a new plant or animal to the existing community can cause the extinction of the biota occupying that niche, thus endangering all species in that area.”
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What is an Ahupuaʻa?

Map and image of an Ahupuaʻa, a traditional Hawaiian land division.
MINA SITES

Where We Work

- Ala Wai Canal and Watershed
- Bishop Museum
- Diamond Head State Park/Peace Garden
- One‘ula Limu Project
- Foster Botanical Gardens
- Halawa Valley Heiau
- Hanauma Bay
- He‘eia Loko I’a
- Kahana Valley
- Kaho‘olawe
- Kaniakapupu, Nu‘uanu
- Kapapa Lo‘i o Kanewai
- Kawainui
- KCC’s Native Plant Gardens (Malama Mala)
- Keaiwa Heiau
- Lyon Arboretum
- Makiki Nature Center
- Makua Valley
- Mokaua Island
- Palehua
- Palolo Valley
- Ulupo
- Waihe‘e Lo‘i
- Waikalua Loko I’a
- Wawamalu Beach Park/Ka Iwi Shoreline
Ulupo Heiau and Loʻi
Halawa Valley Heiau
Heʻeia Loko Iʻa
Mokauea Island
Exploring My Backyard.... And Beyond

2012
EXPLORING MY BACKYARD ... AND BEYOND, 2012

June 4-15, 2012 – Monday to Friday 8am-4pm
Home-based at the Palolo ‘Ohana Learning Center
A cooperation between Kapi‘olani Community College (KCC), University of Hawai‘i at Mānoa, and the Palolo ‘Ohana Learning Center

Sponsored by

- Hawai‘i Experimental Program to Stimulate Competitive Research (EPSCoR)
- Educational Talent Search (ETS)
- Palolo ‘Ohana Learning Center (POLC)/Mutual Housing of Hawai‘i
- Hawai‘i Pacific Islands Campus Compact (HIPICC) and Learn & Serve America
- Several community partners and IHE programs, departments, and administrative offices
EXPLORING MY BACKYARD ... AND BEYOND, 2012

Participants

1. Rising 7th and 8th graders
   - from schools with high populations of children of Native Hawaiian and Pacific Islander ancestry
   - who have not yet excelled in science and math
   - Who are facing economic and other challenges

2. College Students as mentors, tutors, and instructors
   - Service-learning students
   - Paid student leaders

3. Community partners, IHE faculty and administrators, including members of the AmeriCorps VISTA program
**EXPLORING MY BACKYARD ... AND BEYOND, 2012**

Activity-packed full-day summer program to allow participants

- to discover the fun and relevance of STEM disciplines (science, technology, engineering, and math) within their own social and cultural environments and contexts
- to build skills in STEM disciplines
- to be exposed to experiential education
- to be inspired in their current educational paths as well as broadening their interest in future careers in STEM-related fields
- to increase civic (including environmental) responsibility and be given practical and theoretical knowledge about and experience with sustainable living
EXPLORING MY BACKYARD ... AND BEYOND, 2012

A few examples of activities

- Lab activities at KCC – inside and outside

- Visit and lab exercises at the Moku o Loʻe (Coconut Island) Hawaiʻi Institute of Marine Biology – a marine research institute of the under the UH Mānoa School of Ocean and Earth Science and Technology

- Exploring water and electricity resources of our islands through field trips, lab exercises, and lectures

- Studying green economy, alternative food production (aqua/hydroponics) through field trips, lab exercises, and lectures

- Working and learning at traditional Hawaiian sites such as Heʻeia Loko ʻIʻa (fishpond), Papahana Kualoa Waipao, and Ulupō Loʻi and Heiau
EXPLORING MY BACKYARD ... AND BEYOND, 2012
Indigenous ways of doing and knowing

- Placebased learning
- Ma ka hana ka ‘ike – learning through example and practice
- Ahupua‘a, sharing, preservation
- I ka wa mamua, ka wa mahope
- Navigation, healing, ...
Assessment

- This was our second annual summer program
- Pre- and post surveys showed increased interest in STEM-related careers
- Grades in STEM-related disciplines improved
- Strong interest in continued participation in STEM-related activities
- College student and faculty professional development

Follow-up

- Palolo Discovery Center Science
- Field activities with the Malama I Na Ahupuaʻa program
- Ka Holo Waʻa project
- Summer 2013 Program
Ka Holo Wa'a Project

2013
Ka Holo Waʻa Service-Learning Program

This program’s focus is aimed at introducing students to the many facets of the waʻa. For Native Hawaiians, the waʻa is an integral part of their existence in these islands. It is both a physical, and spiritual representation that connects today’s Native Hawaiian population to their ancestors who first sailed to the islands hundreds of generations ago. Yet, the waʻa also represents the cultural connections that Native Hawaiians have with many other Pacific Island Communities. In this sense the waʻa is the link that binds Pacific Island communities to each other, historically but also contemporarily. If not for the guidance of other Pacific Island communities and peoples such as Master Navigator Mau Piailug of Satawal, the revitalization of traditional sailing and way-finding practices in Hawaiʻi would be lost today. By introducing students to the practice of traditional way-finding, the intent of this program is to perpetuate the tradition of the canoe as a link that connects Pacific Island communities.
Program Details:

Students will be introduced to the traditions of the wa‘a through Kānehūnāmoku, a replica double-hulled, traditional coastal sailing vessel. Service-learning students from the UH system will conduct 20-25 hours of service learning.

Students will meet on one Saturday per month throughout the academic semester.

The sailing components of the program will take place in Kāne‘ohe Bay, which will serve as the programs laboratory. On each Saturday, students will learn the numerous parts, and functions of the canoe, along with traditional sailing and navigational skills.

In March and April, the college students will share their skills with students from Jarrett Middle and Kaimuki High School both part of the Pālolo Pipeline Program
Kānehūnāmoku

Guided by the heavens our ancestors populated every corner of the Pacific. Through keen observations of the environment they were able to glide over the vast ocean with confidence and intent. Today the canoe remains an integral part of our existence, spurring cultural revitalization and reawakening ancient knowledge. Based on the legacy of Pius Mau Piallug, the Kānehūnāmoku program perpetuates the tradition of the canoe to help guide our people towards their destinations, in and out of the canoe, with the same confidence and intent of our ancestors.

**Program Components:** professional development opportunities for business and organizations looking for a unique experience to bring strategic focus and teamwork to the work place.

- ‘Ohana-based education.
- One time or ongoing educational experiences for schools.
- Sailing and navigational skills training for youth and adults.

http://manamaoli.org/kanehunamoku.html
The Kapiʻolani Community College STEM Program

The goal of the Kapiʻolani Community College STEM Program

- To improve the overall quality of education in STEM fields
- The Summer Bridge Program
- Undergraduate research projects
- Traditional instructional classes at the college

This in turn will lead to an increase in the number of STEM students transferring into 4-year degree programs, which will ultimately prepare the students for careers within one of the major STEM disciplines.

The program itself was born in August of 2005 with a $1.25 million Tribal Colleges and Universities Program (TCUP) grant from the National Science Foundation (NSF) for the development and implementation of the STEM program. One of the goals of the TCUP grant is to increase student diversity, with a special emphasis on Native Hawaiian students, in regards to students majoring in one of the STEM disciplines.

- [http://stem.kcc.hawaii.edu/](http://stem.kcc.hawaii.edu/)
Impacts On Myself

- Being a STEM/MINA Student
  - Guiding me towards a career in Sustainability/Conservation Ecology
  - Provided a link between my studies and culture
  - Given me an opportunity to share my manaʻo
  - Exposed me to different cultures
  - Engaged me in the community
Learning through Interview
Learning through Interview
PDSC Laser Engraver
PDSC Aquaponics
PDSC Aquaponics
Research-Based Learning
Research-Based Learning
Some Stories on Education
Some Stories on Education
Some Stories on Education
Some Stories on Education
Some Stories on Education
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