

# 2008 ANNUAL REPORT



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# AN OVERVIEW OF THE YEAR FROM THE PRESIDENT OF THE BOARD



Roberta Fujimoto Chu, President of The Kohala Center's Board of Directors, was born and raised in Hilo, Hawai'i. A graduate of Hilo High School and Mount Holyoke College, Ms. Chu has held the positions of Vice President & Manager of Commercial Banking at First Business Bank in Los Angeles, California, and the Director of Finance for Hawaii Planing Mill in Hilo, Hawai'i. She currently serves as Senior Vice President of the Bank of Hawaii. Ms. Chu is the 2006 recipient of the Athena Award, an international recognition of her accomplishments as a leading business woman.

As we listen to the needs of island residents and consider the research and educational interests of our university and agency partners, our work at The Kohala Center becomes more and more focused on the basics of life: energy, food, water, and ecosystem health. And as we address life's challenges, we create local solutions that have global impact.

In our work *about* and *for* the environment and humanity, we position the Island of Hawai'i as the world's most vibrant research and learning laboratory. We become more connected to the world's knowledge economy. We also create jobs and educational opportunities of the very highest quality for island residents.

Reporting on what he finds most relevant about the Energy Sustainability Plan developed in collaboration with the County of Hawai'i and Yale's School of Forestry and Environmental Studies, Mr. W. Allan Bean of the Department of Energy for the island nation of Bermuda says:

"The aspects of the Hawai'i Plan most valuable to us are listed in the Executive Summary of the Plan. The following is a short list:

- Bermuda is 98% dependent on imported fossil fuel;
- Our electric rates are among the highest in the world and the fuel adjustment rate is currently about 90% of the average end-user billing;
- Due to our reliance on petroleum-based fuels, Bermuda is vulnerable to the volatility of the global oil markets, sending more than \$100 million [Bermuda currency] out of our local economy each year; and
- To create key data sources and develop a roadmap for energy sustainability and utility sustainability."

**Program activities.** The Kohala Center conducts studies that consider the systemic implications of natural resource allocations, in ways that are concrete and that translate into effective public policy. This capacity makes us unique in Hawai'i. Furthermore, in all of our efforts, we reach out to the public, so that residents can be informed about critical resource issues. By being informed, residents can better participate in making decisions about our island planet's future. This is our way of supporting individuals and communities who think for themselves.

In the field of energy, our work with the County of Hawai'i and the School of Forestry and Environmental Studies at Yale University matured into a comprehensive Energy Sustainability Plan, which was adopted by the Hawai'i County Council in the fall of 2007. This study made it absolutely clear that our dependence on fossil fuels is crippling our

local economy. In 2007, for example, the Island of Hawai'i spent about \$750,000,000 to import fossil fuels. The study went on to show that simply by addressing issues of efficiency, the projected increase in fossil fuel consumption between 2007 and 2030 could be entirely eliminated. Several key recommendations in the Energy Plan have been formally adopted by the County, but much work remains to be done to engage island residents, the public and private sectors, and the utility to make the changes that will be necessary to achieve energy self-sustainability by the 2030 target date.

In the area of food, The Kohala Center supported the Rocky Mountain Institute's initial, high-level systems study of food production on our island. From this study we learned that 60% of all cultivated lands in the State of Hawai'i are situated on Hawai'i Island, yet still we import 85% of our food and export most of what we grow. At our October 2007 Hawai'i Island Food Summit, participants called for a wholistic approach to island resource management. The crowd of 350 producers and consumers insisted that issues of food production must be considered in relation to energy issues. Richard Ha, Kohala Center board member and prominent island farmer, continues to remind us that local food production is in peril because of the rising cost of utilities and petroleum-based fertilizers. Island residents are justifiably concerned about food security. This may explain why noncommercial agricultural initiatives are thriving. In the last year, The Kohala Center's School Gardens Network has expanded to serve thirty-five school gardens around the island.

Without water, life stops. In May of 2008, with the support of the Hawai'i County Council and the County's Department of Research and Development, a water systems study was launched in liaison with the School of Forestry and Environmental Studies at Yale. By March of 2009, we hope to present island public and private sector leaders with an initial integration of studies across energy, food, and water systems, as well as with the policy implications of such an approach.

In the area of ecosystem health, our work at Kahalu'u Bay has drawn the active involvement of over 200 volunteers and three dozen businesses. Through ReefTeach, a project currently managed by The Kohala Center, visitors and residents alike are taught how to enjoy the marine resources of the bay while protecting the fragile coral reef environment. Without this effort, which was originally initiated by the University of Hawai'i Sea Grant Program and the Hawai'i Girl Scouts, the bay is at risk of being trampled to death by over 450,000 users a year. The Kahalu'u Bay Restoration Project is moving very quickly toward an understanding of the interaction of marine and terrestrial environments through the monitoring of nearshore habitats. An important part of this project is the development and integration of Western and Native Hawaiian indicators of ecosystem health. We expect continued success at Kahalu'u Bay, and we expect to see this project model "pod" along the western and eastern coastlines of Hawai'i Island. Requests for assistance to replicate the Kahalu'u model have already been met by Kohala Center staff.

**Local-global partnerships.** Our work connects island expertise with expertise from organizations that operate in the regional, national, and international arenas. In this fiscal year, we have worked with a wonderfully diverse cadre of project partners, including



among many others: Edith Kanaka'ole Foundation, Redlands Institute, The Andrew W. Mellon Foundation, Kamehameha Schools, Cornell University, Ka 'Ahahui o ka Nahelehele, Brown University, Na Kalai Wa'a Moku o Hawai'i, the University of California at Santa Barbara, Bishop Holdings Corporation, Sokendai – the Graduate University for Advanced Studies in Japan, the University of Hawai'i, 'Ano 'ano Aloha, American Association for the Advancement of Science – Pacific Division, the National Oceanic and Atmospheric Administration, the University of Washington, Hawai'i Community College, Office of Naval Research, Hawai'i State Department of Education, the National Park Service – Ala Kahakai National Historic Trail, and the School of Forestry and Environmental Studies at Yale University.

**Job creation.** The Kohala Center is itself an example of the job creating potential of respectfully engaging the Island of Hawai'i as a valuable research and learning laboratory. In January 2001, The Kohala Center was announced as a concept: it had no offices, no employees, and no operating budget. Today, the organization supports 17 employees, who work with approximately 50 contractors, ranging from camp cooks to marine biologists, copywriters, curriculum specialists, applied mathematicians, media relations experts, and oral historians. Staff and contractors design, coordinate, and implement teaching and research programs. In addition, they push for excellence. The Kohala Center is a thriving example of what it means to embrace our island's place in the global knowledge economy.



**Education.** As we build a knowledge-based economy, we must ensure that island residents can assume the new jobs that are being created. Toward this end, we are honored that the Kohala Elementary School invited us to support its efforts to bolster science and mathematics education. Over the last four years, The Kohala Center has been working to develop curricula integrated across science, mathematics, literacy, and the arts for grades two through five. In the next fiscal year, an integrated science and art curriculum will be created and installed in the first grade. In addition, a fully equipped science resource center will be completed by the fall of 2008. Also, in the next fiscal year, we expect to work with elementary schools in the Hilo complex.

**Intellectual leadership.** With the support of The Andrew W. Mellon Foundation and Kamehameha Schools, the Mellon-Hawai'i Doctoral and Postdoctoral Fellowship Program was established at The Kohala Center to promote leadership development

among gifted Hawaiian intellectuals. We look forward to having these talented scholars assume leading positions in their fields of research and to seeing these individuals head up our academic institutions and scholarly societies. We congratulate the first cohort of Mellon-Hawai'i Fellows. The postdoctoral fellows are: B. Kamanamaikalani Beamer, Sydney Lehua Iaukea, and Kathleen L. Kawelu. The doctoral fellows are: Noelani Arista and Nanette Nālani Sing.

**Managing growth.** In the spring of 2008, the Board of Directors and senior staff of The Kohala Center met to address an important challenge: How do we manage growth? Given our staff's capacity to address the needs of island residents and the interests of our university and agency partners, The Kohala Center has grown very rapidly. The Kohala Center is successful because it is responsive *and* flexible, but as with any organization, growth brings added layers of management and a more complex internal governance structure. We do not wish to become an inward-looking bureaucracy, but rather to remain an outward- and forward-looking organization.

In addressing this concern, the Board directed the staff to (1) develop business and operating manuals that record practices and procedures that will continue the organization's current success at serving its constituencies; (2) develop a formal network of small organizations or units that grow out of The Kohala Center's work; (3) organize such a network, so that The Kohala Center operates at the center to manage financial services and communications and to lead and coordinate the efforts of the various units; and (4) identify and nurture programs that could eventually "pod" into these relatively autonomous smaller units, thus creating a "family" of Kohala Center organizations.

Current possibilities for such "pods" include energy and the built environment; sustainable agriculture; ecosystem health; and integrative science, or geographic information science-based efforts to bring together Native Hawaiian and Western knowledge systems and to make the resulting data accessible and useful. Each of these smaller "pods" focuses expertise within its scope of work. By coordinating and linking these specialized "pods," The Kohala Center can bring together resources and create the synergy needed to generate new knowledge—integrated knowledge for island communities *and* for the academy. So, our answer to the question, "How do we manage growth?" is: "By remaining small."

**Staff recruitment and retention.** Another area of concern is talent. Any academic institution relies upon its people, their knowledge, and their professional experiences. In an organization like The Kohala Center, unique in its ability to conduct work through multi-institutional and multi-sector partnerships, that fact is doubly true. The senior staff at The Kohala Center brings its long professional histories to the table: collectively, the Executive Director, the Deputy Director, and the Chief Financial Officer bring more than 75 years of experience to their work, and their professional networks have national and international reach with regard to community, university, research agency, government, and philanthropic ties.



The Board supports the senior staff in their commitment to excellence. Our senior staff has set high standards for the organization—standards that are grounded in excellence in communications, responsiveness, planning, and execution. In our collaborative efforts, senior staff carefully designs projects which honor the particular strengths of our institutional partners and recognize their institutional independence. This is not easy work. It requires expert oversight by those with experience and credibility.



As we continue to grow, issues of succession and expansion among the senior ranks of the organization will need greater attention. The challenges are multiple: we must compete nationally with regard to salaries and benefits, with the intention of bringing skilled expatriates home to Hawai'i. We must seek to create a career ladder within The Kohala Center, so that talented young professionals will choose to remain with the organization; thus, the notion of creating a “family” of organizations is appealing because it creates a deeper institution with more opportunities for learning and growth for young professionals. Once recruited, we must strive to keep younger talent on the island, a place where they may feel professionally isolated since a critical mass of intellectually engaged professionals has not yet been built. We must do all of this in order to continue to serve island communities and the academy well.

**Evaluation.** Maintaining quality work requires evaluation. The standard project-by-project method is no longer adequate for our stage of growth. We need formalized, consistent, and persistent evaluation to ensure that each of our programs can be continuously improved and to ensure that our organization, as a whole, is effective. Over this next year staff will actively develop academic partnerships in which graduate students in the field of program evaluation can be placed by their faculty supervisors with The Kohala Center. The rapid growth of our programs makes us an interesting and viable partner for such collaborative evaluation efforts.

**Organizational governance.** Dr. Christian L. Gulbrandsen and Mr. Carl A. Carlson retired from the Board of Directors after serving for seven years as Founding Directors.

We are indebted to them for their visionary leadership and for establishing a strong programmatic and financial foundation for the organization.

Joining the Board of Directors are: Mr. Richard Ha, Mr. John Powers, Esq., and Mr. James Takamine. Mr. Ha is a graduate of the University of Hawai'i at Mānoa and a recognized leader in sustainable agriculture. Among Mr. Ha's recent recognitions are the 2006 Hawai'i Farmer of the Year Award and the Rainforest Alliance's ECO O.K. Award. Mr. Powers, a graduate of Harvard College and Stanford University Law School, is an expert in estate planning and trust and nonprofit law. Mr. Takamine, a graduate of Kamehameha Schools, Macalester College, the Kennedy School of Government at Harvard University, and the Tuck School of Business at Dartmouth College, is Market Manager for American Savings Bank on the Island of Hawai'i. In 2007 Mr. Takamine was chosen by *Pacific Business News* as one of "Forty under Forty" in the state, for achievement in his business career as well as for his commitment to community service. We are grateful to Messrs. Ha, Powers, and Takamine for joining us, further bolstering the excellence of our board and our organization.

**Lois-ellin Datta, Ph.D., Kohala Center Senior Scholar, and Principal, Datta Analysis.**



"The Kohala Center has achieved exceptional impact in just a few years. The Center, creating new partnerships, has affected County energy and sustainability policies; has revitalized the kuleana [land stewardship] efforts in our precious places such as Kahalu'u Bay; and has transformed the intellectual lives of many of our Hawai'i keiki [children] as well as those of graduate students and researchers from far and near. A new organization, doing things in boldly new ways, the Center is widely and deeply respected for its integrity in action and imagination in path-finding."

**Financial matters.** In Fiscal Year 2007-2008, total revenues were: \$2,464,100. Restricted donations: \$1,014,450. Unrestricted donations: \$280,300. Earned income: \$1,169,350. Expenses were: \$2,050,100. Net income for 2007-2008 was: \$414,000 (of which \$400,000 is restricted to planned programmatic expenses for FY 2008-2009). Total assets for Fiscal Year 2007-2008 were: \$487,000.

Please note that the \$2,050,000 in expenses represent new income in the island economy. In the past year, The Kohala Center spent \$627,000 on local payroll and another \$627,000 with independent contractors, contributing approximately \$1,250,000 to local family earnings, not including expenses for supplies, meals, and other locally obtained goods and services. This expenditure is a strong indicator of The Kohala Center's job creation potential.

Since all of The Kohala Center's work begins with small projects that slowly grow into programs, each program is sustained by multiple streams of funding. No single source of funds dominates, thus adding to the stability of the organization's financial outlook. In Fiscal Year 2007-2008, 3% of the funding came from federal contracts, 4% from state contracts, 14% from local government contracts, 10% from private contracts, 16 % from program fees, 26% from private foundations, and 27% from individual gifts.

Fiscal Year 2007-2008 was a productive year for The Kohala Center. We thank you for your support as we build research and educational programs that sustain the natural environment, serve island communities, and advance the work of the academy.

Sincerely yours,

A handwritten signature in black ink, reading "Roberta F. Chu". The signature is written in a cursive, flowing style.

**Roberta Fujimoto Chu, President**

Board of Directors

# FROM THE DESK OF THE EXECUTIVE DIRECTOR

How fortunate I am to find myself back home in Hawai'i during my most productive years.

At the turn of the millennium, my life shifted rather dramatically. I had been sitting in a glass tower in Southern California, staring at miles and miles of traffic streaming by me, feeling distant from all of the communities that I hoped to serve as a staff director for a large foundation. The telephone rang, and when I answered the call, a trusted colleague extended an intriguing invitation, "We have a really curious and interesting situation in Hawai'i. Would you consider helping us understand what's going on?"

I learned about the following: in a bold and clear response to a community health survey, residents of the northern regions of Hawai'i Island asked for greater educational opportunities for island youth, assurance that young adults would be qualified for the new jobs that ought to be coming to the island, and more jobs that would engage island residents in ways that provided opportunities beyond housekeeping work at the resorts. Their message was clear—North Hawai'i residents wanted education, more education, and a diversified economy.



That call led me to the curious and interesting town of Waimea, a feisty community that seems to consistently outpace professional opinions about what ought to and could be accomplished in rural Hawai'i. Much here was familiar to me. I immediately recognized that powerful and determined sense to take control of one's own future because I grew up in Hanapepe, Kaua'i, where independent merchants, salt makers, union activists, pig farmers, and taro growers created a tough-minded culture. I also recognized the talk about "those Honolulu people," the fancy folk from the city.

At once practical and visionary, Native Hawaiian leaders helped me understand that we could respond to the call of island residents to build a diversified, knowledge-based society and economy if we viewed the land itself, the *'āina*, as a source of knowledge. Thus began this most unlikely, unexpected, and very happy journey.

When highly trained strategists ask our current staff members what The Kohala Center's planning process is, we simply respond by saying, "We listen." We listen to the hopes and dreams of island residents. We listen for points of agreement. And we work with what we have—the very powerful Island of Hawai'i, its natural and cultural assets, its world class thinkers and leaders, who draw others like themselves from around the world to this special place we call home. Together, we are developing local knowledge that has global impact.

I know that I speak for the rest of the staff when we say we feel blessed to be provided with such meaningful work and the opportunity to serve our island planet. *Mahalo nui loa* for your continued support and for your belief in our collective future.

Sincerely yours,



**Matthews M. Hamabata, Ph.D.**

Executive Director



Matthews M. Hamabata was born and raised in Hanapepe, Kaua'i, Hawai'i. After completing his secondary education at Mid-Pacific Institute in Honolulu, he received his undergraduate degree at Cornell University and an M.A. and Ph.D. from Harvard University. He first taught at Yale University, served as the Dean of Haverford College, and was the Director of Learning at the California Endowment. He is Professor Emeritus at the Fielding Graduate University, a former Fulbright-Hays Fellow, and a recipient of the Literary Award of the Athenaeum of Philadelphia.

# SHARING OUR WORK

**The power of smallness.** Small, thoughtful, and directed actions can summon great changes. Here, on the Island of Hawai'i, The Kohala Center has worked with its partners on the island and from abroad to initiate many small actions which have rippled into larger programs, partnerships, conversations, and commitments, and the beginnings of a sea of change. Our commitment to smallness and to finding solutions that benefit our people and our environment has begun to create models for sustainable living for communities around the globe. For example, The Energy Department on the island nation of Bermuda recently contacted us to learn more about our Hawai'i Island Energy Sustainability Plan. What we are doing is making a difference, here and elsewhere.

In the pages which follow, join with us in celebrating some of our small successes.

Louis Derry, Kohala Center Senior Scientist, and Director, Biogeochemistry & Environmental Biocomplexity Program, Department of Earth & Atmospheric Sciences, Cornell University. Shown here are Louis Derry, his wife and fellow Cornell professor Alexandra Moore, and their children Ellie (left) and Claire (right).



"Hawai'i has a truly unique combination of attributes that place it among the best sites in the world for fundamental research on the interaction of climate, biota, and geology. The remarkable climate contrasts, the continuous creation of new land surface by the volcanoes, and the ecosystems that have evolved in relative isolation exist nowhere else on Earth. This set of assets has created one of the best 'natural laboratories' for environmental research that we have anywhere on the planet."

**Energy.** Rising fuel costs trickle down into most every aspect of doing business on Hawai'i Island, from higher utility costs, to higher transport costs, to the ripple effects of recent airline bankruptcies. At a recent Energy Forum island leaders gathered to discuss challenges and opportunities of the new economic reality on Hawai'i Island as a result of the current energy "crisis." National, state, and county leaders who spoke at the Forum all acknowledged the importance of changing now. The old paradigm of resolving problems through 30-year plans was called into question: 30 years, they acknowledged, is too long to wait to solve this energy crisis.

Richard Ha, Kohala Center board member and island farmer.

"The 800-pound gorilla in this room is the fact that we have come to rely on oil for our lifestyle. But the supply of that oil cannot keep up with demand. The world is changing in ways we don't even want to imagine. This is a scary time. But, it is also an exciting time. With great adversity comes great opportunity. We can do this."

Working together with the Hawai'i County Department of Research and Development, with the County's Energy Specialist, and with other experts throughout the state, The Kohala Center and the School of Forestry and Environmental Studies at Yale University have developed a comprehensive set of energy recommendations for the Island of Hawai'i, which was officially adopted by the Council in October 2007. Development of the recommendations involved meetings with public and private sector stakeholders, sessions for community input held around Hawai'i Island, and sessions for Hawai'i County administrators and County Council members. The plan recommendations provide a blueprint for Hawai'i Island to transition to greater energy self-sufficiency.



**Pete Hoffmann, Hawai'i County Council Chairman.**

**"The time-honored approach in this County has been to let our plans lie fallow on the shelf. Prior to this time, our energy-related activities consisted of roundtable forums, which seemed to suffice as the benchmark of success. That day is gone—it was gone 10 years ago. We must now be engaged, committed, and aggressive in our efforts to implement this plan. Nothing in the plan is rocket science; it lays out simple steps and recommendations that need to be implemented."**

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Key energy-related legislation passed since the start of 2008 includes legislation which:

- Requires the County to purchase fuel-efficient (average 35 MPH) vehicles for its fleet;
- Requires the County to install solar water heating systems and photovoltaic systems on new County buildings;
- Requires that new County facilities comply with the energy-efficient building practices contained in the current International Energy Conservation Code;
- Requires the Department of Water Supply to seek out ways to increase energy efficiency in its water pumping and delivery systems; seek out ways to use distributed and renewable energy generation to pump and transmit water within its system; and draft a comprehensive water conservation policy which identifies ongoing practices to reduce water and energy demand within the County on a day-to-day basis; and
- Requires the Hawai'i County Transit Agency and the County administration to draft a strategic plan designed to increase ridership 20% per year through 2015 in order to meet the target established by the Hawai'i County Energy Sustainability Plan; the strategic plan will include short- and long-term measures to expand the County's public bus service.

The Hawai'i County Council is now (October 2008) considering legislation that requires all new Hawai'i Island construction to comply with the energy-efficient building practices contained in the current International Energy Conservation Code.

Without significant additional changes to the regulatory framework which governs our utilities, and without profound changes in our individual lifestyles -- we may still fall short of our goals. The good news is that the Hawai'i County Energy Sustainability Plan is serving as a springboard for research-based legislation and is creating momentum for systemic change on the island. "The systems analysis and policy recommendations developed with our academic partners are now resulting in positive community and Council action," reports Betsy Cole, Kohala Center Deputy Director.

We have taken the first steps. We have outlined a viable selection of energy efficiency and renewable energy options for Hawai'i Island. And we have identified the policy changes at the state level needed to facilitate implementation of these options. Now The Kohala Center will focus on citizen education and community engagement to support long-term implementation of the County's energy plan. Prior to the 2009 legislative session, The Center will help to brief County and State representatives about energy policy and the choices being presented to the legislature and to the Public Utilities Commission. Throughout 2008 and 2009 we will collaborate with respected nonprofit groups throughout the state and with the State-sponsored Hawai'i Clean Energy Initiative to provide relevant energy information to the press and to citizen groups. With the right information, we can all make decisions that promote the sustained health and prosperity of our families, our communities, and our islands—and take our place as a model for the world.



**Food.** The Kohala Center recognizes that increasing our local food supply and creating effective food distribution systems is an essential part of the transition to greater island self-reliance and sustained economic security.

**Richard Spiegel, Volcano Island Honey.**

“Food shortages and world hunger are growing. Approximately 30% of food consumed by humans is dependent on honeybees for pollination. Honeybees worldwide have been decimated by the Varroa mite – a tiny, external parasite which feeds on the bees’ hemolymph (blood). In August 2008 these mites were discovered for the first time in a hive in Hilo. Hundreds of thousands of queen bees are bred yearly on Hawai'i Island and shipped worldwide, so hundreds of thousands of bee colonies that pollinate food crops worldwide are dependent on the queens raised here. The queen breeding environment of Hawai'i Island is now critically endangered by the Varroa mite.”

More than fifteen years have passed since the County of Hawai'i last updated its Agriculture Development Plan. Since that time, the last of the sugar plantations closed and many acres of former cane land now lie fallow. Most of what is grown here is exported, and local food production is in jeopardy due to rising fuel, fertilizer, and shipping costs. Through a contract with the County's Research and Development Department, The Kohala Center is partnering with Agricon Hawaii LLC, an island-based agricultural consulting firm, to draft a new Agriculture Plan for the County. The plan will identify emerging opportunities for commercial farming and address critical issues of food security, making recommendations for future resource allocation, policy changes, land use decisions, and further diversification of agricultural production on the island. An ad hoc committee, composed primarily of island residents who are in the business of farming, will participate in helping to draft the plan with additional information provided by the general public.

The Kohala Center hired a full-time director for the Hawai'i Island Food Systems Project in late July. Jeremy Kwock, born and raised in Mō'ili'ili, O'ahu, has an MBA from the University of Southern California's Marshall School of Business. Kwock will now apply his business acumen to the critical job of increasing the local market share for island-grown food. Kwock's first priority is to help local farmers with business planning, market research,

connections to financing, and general business strategy. If there are no local farmers, then there can be no local food consumption.

The Kohala Center is also coordinating the Hawai'i Island School Gardens Network, and helping to identify and expand exemplary garden projects in communities around the island. There are currently thirty-five projects, at varying stages of development, participating in the Gardens Network. The immediate goals of the project are to encourage youth and their families to grow edible plants and trees, to teach respect for and knowledge of traditional Hawaiian food crops, and to teach techniques for maintaining and developing sustainable agriculture in Hawai'i. Long-term goals are to encourage the younger generation to take up careers in agriculture.

School gardens are helping to revitalize the local food economy on Hawai'i Island. By involving students, their family networks, and their communities in food production, school gardens are helping to create pathways of influence and behavior change which reach into homes around the island. The gardens promote the message that our island can and should increase its consumption of locally produced food.

**Nancy Redfeather, Hawai'i Island School Gardens Network Project Director.**

"Varied and rich garden programs are being pioneered in all corners of the community. We are returning to something we know is the right thing to do. These young men and women and their mentors are taking on learning the knowledge of how to grow food. And in so doing, they are learning once again to connect with the land and with each other."



**Water.** In order to make wise decisions about how to manage human impacts on our island's natural resources, we must think systemically about energy, food, and water. As part of The Kohala Center's efforts to provide the best possible information to island leaders, The Kohala Center is working with faculty and graduate students at the Yale University Center for Industrial Ecology to complete a water sustainability analysis for Hawai'i Island. By the spring of 2009, we hope to complete an initial integration of studies across energy, food, and water systems, as well as the policy implications of such an approach.

The existing water system on the island is far from integrated. Drinking water, agricultural water, and wastewater are regulated by different entities, which include the County Department of Water Supply, the State Department of Agriculture, the County Department of Environmental Management, and various private landowners. By taking a systemic look at water and energy flows on the island, the Yale team is attempting to connect these systems together – in order to identify possibilities for resource conservation. For example, reusing wastewater for irrigation and composting can save valuable potable water resources, as well as energy used for pumping water from groundwater sources. As prices for resources rise, so do the benefits of using these resources wisely.

Yale team members Zeke Fugate and Jake Iversen will have completed the first phase of their work by late summer 2008, but refining the initial findings into an action plan will continue for some time. The team has set three ambitious goals for the Hawai'i Island water study:

**To develop a framework to assess the sustainability of existing**

**water systems on the island.** The framework will consider all aspects of the water system – from source water extraction to treatment, distribution, and in-home consumption, to wastewater collection, treatment, discharge, and/or reuse. The framework is meant to increase the transparency of water system operations on the island, in order to protect valuable and vulnerable natural resources and to provide high-quality information for decision makers.

**To conduct a life-cycle analysis for water systems under different scenarios.**

Water systems consume a substantial amount of energy and materials, so it is important to understand the cost implications of various alternatives. The study will model various alternatives, such as surface water source versus groundwater source, centralized treatment system versus decentralized treatment, wastewater reuse versus no reuse. The point of this analysis is to distill out the most promising alternatives, for example, the recovery of vital nutrients from wastewater streams. Recovered nutrients such as nitrogen and phosphorus could replace some portion of petroleum-based fertilizers that are currently imported to the island.

**To study geographical differences among water systems using GIS software.**

An extensive amount of pumping is required to move water around the island. Geospatial analysis can help determine where other alternatives, such as utilizing surface water sources, are more feasible. GIS tools make it possible to organize and present this information on a location-specific basis.



Zeke Fugate, Ph.D. candidate in environmental engineering at Yale University and coauthor of the Hawai'i Island water study.

"The unique conditions that exist in an island setting (finite resources, large transportation distances, ecosystem fragility, etc.) produce an immediate and intensified response to changes in the anthropogenic and natural systems. Resilience, prosperity, and longevity will require careful deliberation, systems thinking, and rigorous analysis of current and future human-induced impacts. By providing a set of measurable indices and by highlighting non-monetary factors, we hope to help Hawai'i Island protect its vital resources and transition to a more sustainable future."

**Ecosystem Health.** On Hawai'i Island the premier reef encounter site for visitors is the County Park at Kahalu'u Bay, a small (4.2 acre) beach park. Formerly a Native Hawaiian fish pond, Kahalu'u Bay is largely enclosed by a fringing barrier that protects it from all but the largest ocean swells and currents. It is featured in every visitor's guide as one of the best snorkel spots in the Hawaiian Islands, due to its clear, shallow water (rarely over 8 feet deep) and abundant tropical reef fishes.

Each year over 450,000 people use Kahalu'u Bay – nearly twice as many users per water acre as at the more developed and protected Hanauma Bay on O'ahu. The coral at Kahalu'u can be damaged and even killed by human touch and trampling.

Five years ago the University of Hawai'i Sea Grant extension agent in Kona initiated a program of educational presentations at Kahalu'u Bay by volunteer ReefTeachers, in an attempt to save the corals from trampling. Two years ago The Kohala Center stepped forward to facilitate these community-driven efforts to protect Kahalu'u Bay. The program has been extraordinarily successful: data collected during and immediately after each teaching session has revealed that trampling damage caused by bay users standing on living coral was reduced by 93%.

The Kohala Center created and nurtured the Kahalu'u Bay Advisory Board, comprised of stakeholders in the bay and its surrounding area. This Advisory Board provides local guidance on program development and operation and facilitates collaboration among various segments of the community.

Cindi Punihaole, Kohala Center Outreach and Volunteer Coordinator.

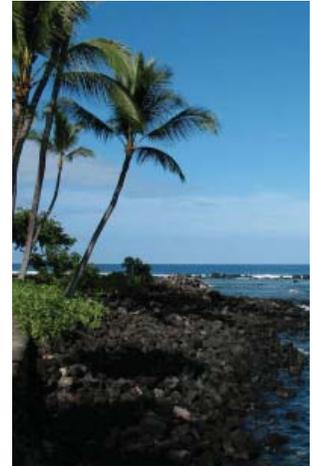
"My passion to restore this park is due largely to the *kūpuna* (Hawaiian elders) that have passed on... many giving their time to share with experts their thoughts on how to take care of this sacred, life-giving place. It has been my desire for many years to help bring back the respect, ambiance, and beauty of Kahalu'u Beach and Bay, according to the wishes of our *kūpuna*."

The ReefTeach Program has been expanded to include the volunteer efforts of over 200 individual ReefTeachers as well as a slew of local businesses which have committed their time and resources to Adopt-a-Day at the bay. Volunteer ReefTeachers provide daily



presentations on coral reef ecology and local organisms, points of interest in Kahalu'u Bay, and reef safety. Educational exhibits, both temporary and permanent, have been installed at the Kahalu'u Bay site in a mobile kiosk and at the bay's pavilion.

Hawaiian cultural practitioners host monthly "Talk Story" sessions about the historical and cultural significance of Kahalu'u Bay and fishponds, reinforcing the Hawaiian concept of stewardship for the land and ocean. The history of Kahalu'u and Keauhou has been recorded and shared thanks in part to a 2008 Preserve America Grant awarded to The Kohala Center by the National Oceanic and Atmospheric Administration (NOAA). The grant provided partial funding for the production of a DVD on the area's history and life stories of kūpuna who lived there. The DVD features kūpuna Mitchell Fujisaka and Allen Wall sharing their stories with ethnographer Kepa Maly. The grant also contributed to the reprinting of the full-color brochure, *Ho'iho'i kūana wahi pana* (Restoring Sacred Places). The brochure, which was created by Kamehameha Investment Corporation, shares the special cultural significance of the sacred sites of Kahalu'u and Keauhou.



This past summer, Brad Kurokawa, Deputy Director for the Hawai'i County Planning Department, invited University of Washington (UW) landscape architecture students and their professor, Iain Robertson, to Hawai'i Island to work with the community to produce a master plan for the park. The Kohala Center hosted a week-long design charrette at the park, in which community members, including homeless residents, were encouraged to express themselves and imagine a park that embraced their wishes. The Kohala Center – UW team recorded the highest hopes of the community to restore this special place in the heart of Kona, in a *pono* (respectful) planning process that can serve as a model for community in action.

With the community working together to integrate Western and Native Hawaiian practices to restore the health of the bay, this plan has become a catalyst for serious thinking about the proper way to restore the park. Many, many discussions have taken place since the plan was created, including conversations with State and local political leaders and officials, community members, ReefTeachers, Bishop Holdings Corporation management and staff, Kamehameha Schools, Outrigger Keauhou Beach Resort management and staff, coastal geologists, and NOAA.

**Brad Kurokawa, Deputy Director for the Hawai'i County Planning Department.**

"I believe strong community engagement and support is the key to 'institutionalize' the draft plan as the community's vision because we can call upon the community to support it with Parks and Planning Department administrators. Parks administrators have been kept in the loop, are supportive, and actually were invited to participate in the process. This type of active engagement is new for many in County government."

**Ha'ahonua: The Hawai'i Island Digital Geocollaboratory.** From the start, The Kohala Center has committed itself to orienting all of its partners' Western teaching and research programs to Hawai'i Island's cultural and spiritual, as well as natural, landscapes. In this effort, we have been blessed by the generosity of the Edith Kanaka'ole Foundation,

Na Kalai Wa'a Moku o Hawai'i, and other Native Hawaiian organizations, which have shared their knowledge of Hawai'i with The Kohala Center's colleagues.

We have now moved forward to explore how the Western and Hawaiian perspectives, two dramatically different worldviews, can intersect in ways that are insightful and invigorating. We are excited to introduce the GeoCollaboratory Project, called *Ha'ahonua*. In this project, The Kohala Center partners with the Redlands Institute at the University of Redlands, California, as well as with key collaborators at the Edith Kanaka'ole Foundation, Hawai'i Community College, the National Park Service, Cornell University, the University of California at Santa Barbara, and Yale University. The project team combines domain expertise in the humanities, geographic information science, and environmental sciences, with substantial technical experience in the application of geospatially-enabled information systems to complex research and management problems.



The following project description is excerpted from "*Ha'ahonua: Using GIScience to Link Hawaiian and Western Knowledge about the Environment*," by Karen K. Kemp, Senior Scholar at The Kohala Center; Kekuhi Keali'ikanaka'oleohaililani, Executive Director of the Edith Kanaka'ole Foundation and Senior Scholar at The Kohala Center; and Matthews M. Hamabata, Kohala Center Executive Director. The complete paper will be published in the book, *Geography and the Humanities: Interactions and Investigations*, the publication of which is being organized by the Association of American Geographers.

Like many words used in Hawaiian, ha'ahonua can be translated to English in a number of ways. The Hawaiian language is extremely rich: many words and phrases have multilayered interpretations, rich in knowledge and meaning. Ha'ahonua is the name given to our project by our Hawaiian cultural mentor and project collaborator, Kekuhi Keali'ikanaka'oleohaililani. In the context of our project, ha'ahonua can be translated simply as 'the earth dances,' with layers of meaning conveying a sense of humility and the richness of interpretations for *honua* as our home, whether it be the earth or a voyaging canoe....

We envision our Ha'ahonua as a highly interactive, online, geospatially-referenced knowledge portal that provides scholars and the public with important information, modeling, and visualization tools and that builds appreciation for the rich and complex island landscape – past, present and future. Our vision is to establish a 'digital geocollaboratory' founded on Hawaiian epistemology and implemented through the application of geographically-enabled digital technologies. Through this project we will design and implement a cyberinfrastructure which will support both humanities and scientific research activities, and through their integration, a much deeper understanding of the interconnections between people and environment on the Island of Hawai'i. In the process, we hope to renew dialogue and scholarly exchange between historically disparate communities, to demonstrate how indigenous knowledge can support and stimulate research and learning, and to solve problems at the intersection of natural and human systems.

We emphasize that we are not building a simple digital repository or, alternatively, the

hypothetical software 'machine' proposed at the 2005 *Summit on Digital Tools for the Humanities* that would allow users 'to collect data, evaluate them as to their reliability/probability, set them into a time frame, define their temporal relationships with other features of interest ... and, finally, represent their degree of (un)certainty by visual conventions of stylized rendering and by the mathematical expressions state in fuzzy logic or some alternative representation' (Frischer et al. 2005, 21). Our project goes beyond digitizing artifacts, developing engines for rapid cataloging and searching, and applying advanced visualization techniques. Instead, we seek to create an environment in which knowledge grounded in indigenous epistemologies can be integrated with knowledge grounded in the Western scientific epistemology. We wish to explore how GIScience and the associated spatio-temporal toolbox can provide this bridging opportunity.



It is our hope that this pioneering approach may provide a foundation for a much wider-ranging implementation of geographic information science and technology in the Digital Humanities. Humanities scholars are perhaps more open to exploration across related domains than many scientists as their scholarship demands an interdisciplinary approach; their need for information is broad-based though their technological foundations may be limited. This project reaches beyond the immediate benefit to the Hawai'i Island community, to worldwide efforts to represent and preserve ethnic knowledge through digital technologies and is extraordinarily relevant to contemporary societies as we struggle to understand humanity's relationship to the natural world.

**Kekuhi Keali'i Kanaka'oleohaililani, Kohala Center Senior Scholar, and Executive Director, Edith Kanaka'ole Foundation.**

"Ha'ahonua is an invitation to DANCE and CHANT so as to engage all of our elemental SELVES -- our technological self, our forest self, our social self, our ocean dweller self, our land dweller self, our animal self, our ancestral self, our water self, our fire self, our unconscious self, our logical self, and our mythic self."

**Intellectual leadership.** A knowledge-based society requires intellectual leadership of great depth and power. With the support of The Andrew W. Mellon Foundation and the Kamehameha Schools, the Mellon-Hawai'i Doctoral and Postdoctoral Fellowship Program was established, and five leading Hawaiian scholars were selected as the first cohort of Mellon-Hawai'i Doctoral and Postdoctoral Fellows. The Mellon-Hawai'i Fellows are expected to perform at the top of their fields of research and to eventually lead academic institutions and scholarly societies. Three postdoctoral fellowships of \$50,000 each and two doctoral fellowships of \$40,000 each were awarded for the 2008-09 academic year. The fellows were selected by a distinguished panel of senior scholars and kūpuna based on their leadership potential and their demonstrated commitment to the advancement of scholarship on Hawaiian cultural and natural environments, or Hawaiian history, politics, and society.

**Dee Jay Mailer, CEO, Kamehameha Schools.**

“The Kamehameha Schools is delighted to join with The Andrew W. Mellon Foundation and The Kohala Center to support the work of gifted Hawaiian scholars. We expect nothing less from them than to assume top leadership posts in their fields, shaping the world and our island home with knowledge from both. Competing for such scholarships takes excellence in knowledge, experience, and character – these scholars have met these standards and will, upon completion, share their insights with the world.”

The postdoctoral fellows are: B. Kamanamaikalani Beamer, Sydney Lehua Iaukea, and Kathleen L. Kawelu. The doctoral fellows are: Noelani Arista and Nanette Nālani Sing. The Kohala Center will support the progress of the five Mellon-Hawai‘i Fellows in the coming year, and brought the scholars together on Hawai‘i Island in September. The Center congratulates the winning candidates and wishes them great success in pursuing their scholarly work.

**B. Kamanamaikalani Beamer, 2008 Mellon-Hawai‘i Postdoctoral Fellow.**

“My goals as a scholar are very much related to my goals as a Hawaiian. As a Hawaiian, I want to provide work that is valuable for today and that can be used by those who come after me. As an academic I want to provide new forms of analysis and theoretical ways of looking at Hawaiian history and geography that might provide insight into our past, while offering possibilities for our future.”



**Pathways to higher learning.** By creating greater educational opportunities of the very highest quality for island youth, we boost their life and career trajectories. Over the past seven years we have carefully and deliberately built bridges for our youth to participate in programs at some of the nation’s finest academic institutions. And we continue to seek out new academic partners with an interest in mounting programs that benefit island youth. “Aim high” has been our mantra from the very start.

For the past two summers, The Kohala Center has selected young women from island high schools to participate in the prestigious Curie Academy, a competitive, global science, technology, and engineering program for women, at Cornell’s campus in upstate New York.

For each of the past four summers we have cosponsored the attendance of two or three island high school students at Brown University's Environmental Leadership Lab (BELL) Program in Rhode Island. And for the past five years, we have hosted the BELL Hawai'i Program here on Hawai'i Island: two slots are reserved in each program for Hawai'i Island students. At the Curie and BELL programs, talented island students mingle with students from across the country and around the world. They return to their island schools full of enthusiasm for learning, for sharing their new insights with their peers, and for their future careers. An island-wide recruitment is held each year, and through the generosity of The Kohala Center's Circle of Friends, scholarships are provided to the successful candidates to offset their tuition and expenses. Feedback from scholarship recipients is overwhelmingly positive: they report that their participation in these programs has opened their eyes to new friends, new knowledge, and new possibilities.



**Jessie Neel, 2004 BELL Hawai'i cohort and currently attending Colorado State University in Fort Collins, Colorado.**

"If you asked me what part of the program was my favorite I probably couldn't answer. So much happened in such a short amount of time. I loved it all. I learned so much about myself and about my surroundings. Hawaiian culture surrounds me and yet I never knew all that much. This program gave me the opportunity to learn more. It taught me how much Hawaiians value nature and how they let nothing go to waste. I learned more about the severe state of the island's ecosystem and how I can help it improve. This program left me inspired to be the best person I can be and reach for my goals even if they seem impossible."

**K-12 education.** In order to ensure that island youth are qualified for the opportunities in a knowledge-based society, we need to ensure that our public schools provide the very best in educational opportunities.

For the past four years, The Kohala Center has partnered with Kohala Elementary School on the north end of the island to pilot a model science education program for elementary age children. The "Hidden Jewels" (HJ) program was designed specifically for students in grades 2-5, to teach them natural sciences with a Hawaiian perspective.

Prior to implementation of the Hidden Jewels (HJ) program in 2003, there was no cohesive science curriculum at the school, and integration of science lessons was sporadic and dependent on the skill set of the individual classroom teacher. Hidden Jewels was designed to fill the void. Master science teacher Susan Lehner carefully selected the subject matter for each grade level -- material that lends itself to conveying scientific concepts and inquiry processes appropriate to that particular age group. Students' interest is piqued as they discover the wonders of the forest, the ocean, the geology, the cultural traditions, and the night skies that immediately surround them.

The HJ team makes science fun and engaging for students. Lessons typically start by getting students to focus via a powerful attention-grabbing activity. This activity serves as an introduction to basic science concepts, like evolution, speciation, etc. The lesson moves on to encourage scientific inquiry by having students pose questions that they would like

answered. They then work in small groups to come up with ways to find those answers. The master teachers help students make connections between science concepts and other subjects. The underlying philosophy is that every subject is easier learned in conjunction with another. As students begin to relate one subject to another, they both take on more meaning. "Science, writing, math, and art are all naturals to integrate – look at Leonardo da Vinci!" explains Lehner.

Kohala Elementary teachers have responded favorably to the introduction of the HJ program at their school for two big reasons. First, the HJ program saves them valuable time, since they don't have to plan, prepare, or implement a standards-based science curriculum on their own. Secondly, and perhaps more importantly, the HJ program offers them outstanding human resources in the form of master teachers and guest experts from the community.

When the Hidden Jewels program resumes in fall 2008, each class will be invited to reserve a block of time in a fully equipped Science Center. The Science Center will provide a wealth of materials, learning stations, a resource library, and full curriculum guides for Hidden Jewels and, eventually, for all the science disciplines. The Hidden Jewels program has become a whole school transformation project, which is now generating momentum for school-wide change.



Susan Lehner, Hidden Jewels master science educator.

"In four years of teaching this program, I have watched many students come to say that they love science – they want to be scientists. These kids love this hour. It's fun, they're learning things they never even knew about, and they are proud of their knowledge. Many students bring in either related books or items from home the following week. A number of them carry all the previous notebooks they made in earlier grades in their backpacks. Several students have told me, 'I'm keeping my books to show my kids, so they can see what I learned in school.' In the classrooms where I have taught for more than one year, I find that the teachers are thoroughly engaged, setting up related centers in their rooms and covering the material I teach on the days I'm not in the room."

A new science test was part of the battery of tests administered to public school students across the state for the first time last year. Many Hawai'i Island schools did not meet

State standards in science testing this past year, and thus administrators and teachers at these schools are focused on improving test scores. The Kohala Center has been approached to partner with elementary schools in Hilo in an innovative Math Science Partnership program starting in January 2009. We are looking forward to this opportunity to work with the Hilo complex.

The Kohala Center has also partnered with the Kohala Watershed Partnership to sponsor science enrichment programs for children during out of school time. For four weeks this past summer, The Kohala Center's Waimea Nature Camp (WNC) brought together fifty-nine young people and three leaders to explore the natural world through play, field trips, and creative expression. WNC's home base is Ulu La'au, the Waimea Nature Park. According to Camp Director Melora Purell, the goal of Waimea Nature Camp is "to develop in children an ethic of stewardship for our forests, streams, oceans, and other natural resources by engaging their minds through natural science and touching their hearts with the beauty and power of nature." Purell also serves as the Coordinator of the Kohala Watershed Partnership, a coalition of public and private landowners who are committed to restoring the native forest and preserving the watershed of the Kohala Mountain.

Here is some of the positive feedback we received from the parents of our summer campers:

"The price is an unbelievable bargain - truly making this program accessible to all keiki in the community."

"I never had to push my daughter to get her going on camp days - she was out the door before me in the morning!"

"My son came home exhausted and happy. I haven't seen him this satisfied with a summer activity before."

Waimea Nature Camp will return for a third season in 2009: during school breaks in January and March, and again in summer 2009.

**Sharing knowledge and growing the 'ohana (family).** Knowledge from Hawai'i and about Hawai'i is shaping the lives of young scientists. Dozens of college students from around the country and abroad have spent their spring semester on Hawai'i Island as part of Cornell University's Earth and Environmental Systems (EES) Field Program, now in its fifth year. In addition to courses in fields such as geology, marine biology, and biogeochemistry, each cohort of EES students attends a seminar co-taught by Hawaiian cultural mentors and Kohala Center senior staff, called *Contested Terrain: An Introduction to Hawaiian History and Culture*.

EES program graduates consistently report that the Hawaiian concepts of kinship with their land, as conveyed by Hawaiian practitioners who live by these concepts, have a profound influence on them. These young scientists tell us that their lives are changed because of their encounters with Hawaiian culture and history and that their exposure to the Hawaiian



worldview profoundly enriches their understanding of Western science. They have become ambassadors for Hawai'i, ambassadors with a deeper and more complex understanding of our culture, about our politics, history, and society, and of course, our connection to the land. Most graduates of this program have gone on to pursue doctorates, and a few have settled in Hawai'i and are now working professionally in our community.

**Kane McGuire, 2005 EES cohort.**

"In addition to the pure science part of the program, it has also been great to learn the rich cultural history of these islands. The dedication to both the environment and sustainability found in Hawaiian culture is something that I had never fully realized before. I think that such an environmentally conscious cultural background is perfect for a program in natural science like ours. Every day since I've been here I've awoken in awe of the fact that I am currently living an experience that I'll never forget till the end of my days."

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**Noe Noe Wong-Wilson, Cornell EES Program Instructor.**

"The Kohala Center has provided me with a tremendous opportunity to work with students from Cornell University who bring a diverse background and knowledge base to their learning in Hawai'i. The "Contested Terrain" curriculum provides a cultural and natural landscape perspective to the Earth Science semester of study each spring. Together, we investigate the dynamism with ancient Hawai'i people, practices, and beliefs and more recent influences on the culture, land use, and environment. The impact of this Hawai'i experience on the students' learning is profound and personal and induces a deep understanding of aloha 'āina (sense of place) and kuleana (responsibility), basic Hawaiian life principles."

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