



LEAFLET July/August 2008 Front Page

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Native Hawaiian Scholars Awarded Mellon Fellowships

Photo: Noelani Arista hiking the Palehua Trail in the Makakilo area of O'ahu. "Our *halau* (hula troupe) goes hiking at least once a month to learn about the different plants, places, and wind and rain names," she says. "From this point on the trail, I could see all of Nanakuli Valley where I live."



Five leading Hawaiian scholars have been selected as the first cohort of Mellon-Hawai'i Doctoral and Postdoctoral Fellows. Three postdoctoral fellowships of \$50,000 each and two doctoral fellowships of \$40,000 each were awarded for the 2008-09 academic year. Fellows were evaluated on the basis of their leadership potential and their demonstrated commitment to the advancement of scholarship on Hawaiian cultural and natural environments, or Hawaiian history, politics, and society. The fellows were selected by a distinguished panel of senior scholars and *kupuna* (elders) comprised of Robert Lindsey Jr., Kohala Center Board of Directors; Dr. Shawn Kana'iaupuni, Kamehameha Schools; Dr. Dennis Gonsalves, Pacific Basin Agricultural Research Center; Dr. Pualani Kanahale, Edith Kanaka'ole Foundation; and Dr. James Kauhikaua, U.S. Geological Survey Hawaiian Volcano Observatory.

"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." - Dee Jay Mailer, CEO of the Kamehameha Schools

The following individuals were awarded doctoral fellowships:

- Noelani Arista, Ph.D. candidate in the Department of History at Brandeis University, and
- Nanette Nalani Sing, Ph.D. candidate in Interdisciplinary Studies with a Concentration in Educational Leadership/Systems from Union Institute & University in Cincinnati, Ohio.

Photo: Kamana Beamer celebrates after successfully defending his dissertation.

The postdoctoral fellowships were awarded to:

- B. Kamanamaikalani Beamer, Ph.D. in Geography from the University of Hawai'i at Manoa, May 2008, dissertation title: *Na Wai Ka Mana? Native Agency and European Imperialism in the Hawaiian Kingdom*;
- Sydney Lehua Iaukea, completing a Ph.D. in Political Science from the University of Hawai'i at Manoa, dissertation title: *E Pa'a 'Oukou: Holding and Remembering Hawaiian Understanding of Place and Politics*; and
- Kathleen L. Kawelu, Ph.D. in Anthropology from the University of California at Berkeley, May 2007, dissertation title: *A Sociopolitical History of Hawaiian Archaeology: Kuleana and Commitment*.

"As someone born and raised in rural Hawai'i, I am so honored to support this effort, in which indigenous knowledge, local knowledge, advances into the global arena through the inspired work of extraordinarily talented Hawaiian intellectuals." - Matt Hamabata, Ph.D., Executive Director of The Kohala Center.



The Kohala Center will be overseeing the progress of the five Mellon-Hawai'i Fellows in the coming year and will bring 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.

[Learn more](#) about the Mellon-Hawai'i Doctoral and Postdoctoral Fellowship Program. Read more about the work of the [first cohort of Fellows](#).

Native American Political Leadership Program



Photo: Congressman Tom Cole (R-OK) meets with NAPLP students in his D.C. office, where the students posed questions about legislation that affects the lives of our country's Native populations. Photo and caption courtesy of the [NAPLP website](#).

FULL SCHOLARSHIPS are available for Native Hawaiian college students to attend the [Native American Political Leadership Program \(NAPLP\)](#) at George Washington (GW) University in Washington, DC. NAPLP is a newly created program designed to engage promising Native American undergraduates in the political process and prepare them for leadership roles. Students spend their spring semester in the nation's capital taking classes at GW, participating in hands-on internships, and interacting with political leaders and policy makers. NAPLP explores public policy issues affecting Native American communities through a series of special seminars.

Interested students who are American Indian, Alaska Native, and/or Native Hawaiian may [apply online](#) or by downloading and mailing the application to SIW Admissions, The George Washington University, 1922 F Street, NW, Room 401-A, Washington, DC 20052. For further information call (toll-free) 1-800-367-4776 or email NAPLP@gwu.edu. The application deadline for spring 2009 admission is October 15, 2008.

At the End of the Supply Line

Photo: Gail Tverberg (right) on a tour of the Hamakua Springs Country Farm's greenhouses with farmer Richard Ha (left).



"Current global demand for oil is increasing by about 1.8% each year. Yet oil supply has leveled off. There is still some debate about how quickly global oil supplies will decline, but in any scenario we can expect to see a growing gap between oil supply and demand. Right now we're at the plateau. This is not a problem that a 30-year plan will help with - by then the gap between supply and demand will be too large." - Gail Tverberg, Fellow of the Casualty Actuarial Society and Member of the American Academy of Actuaries

On June 6 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." The day's agenda was packed with information from national, State, and County leaders, all of whom 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. The consensus among energy consultants, financial analysts, policy makers, university professors, and even representatives of the electric utility is that Hawai'i Island must start in a new direction now, by harnessing renewable energy from the sun, wind, waves, and geothermal resources which surround us. We must consider lifecycle returns on investments in energy efficiency to understand the true economic value of saving energy. And we must include non-economic factors such as preservation of the environment in our decision-making, so that we limit rising temperatures and manage our carbon footprint for the benefit of future generations.

The consequences for failing to change are dire, but exactly how to get from here to where we need to be in 10, 20, and 30 years from now is less clear. Several promising initiatives are underway to increase energy efficiency and promote cleaner fuels. But without significant changes to the regulatory framework which governs our utilities, and without big changes in our individual lifestyles - we will fall short of our goals. Starting now, we must find different ways to survive on the planet, in general, and on this island, in particular. Hawai'i is at the end of the global supply line and if that supply line fails, we must be prepared to supply our own energy, food, water, etc.

Learn more at the [Hawai'i Island Energy Forum site](#). This web site includes summaries of each of the June 6 Energy Forum presentations and copies of the presenter's PowerPoint slides. One keynote speaker at the Forum was Gail Tverberg, a risk management consultant who advises insurers on resource depletion, particularly peak oil and its impact on the insurance industry. Read Tverberg's recent posting at [www.theoil drum.com](#), titled "Hawaii: Peak Oil Canary in a Coal Mine."

Baseline Water Study

"Water is the lifeblood of society. We all need water to survive." - Zeke Fugate, Ph.D. candidate in Environmental Engineering at Yale University and co-author of a baseline water study for Hawai'i Island being prepared this summer for The Kohala Center

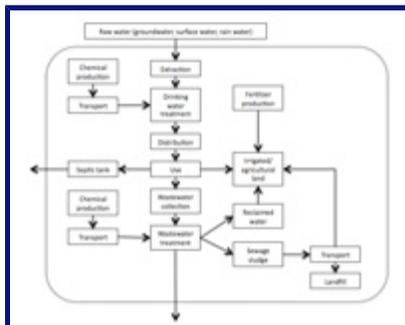


Image: A schematic overview of a typical water system including extraction from the environment (marked by the dashed line), drinking water treatment and distribution, wastewater collection and treatment, water reclamation for irrigation/agricultural applications, and nutrient reclamation for agricultural applications. Each step in the diagram represents an expenditure (or savings) of both energy and materials. By analyzing alternatives for certain steps (such as the water source or the type of treatment), it is possible to identify the most preferable options in terms of economic and environmental impacts. Image and caption by Zeke Fugate.

As part of ongoing efforts to provide the best possible data to island leaders, The Kohala Center is working with faculty and graduate students at the [Yale University Center for Industrial Ecology](#) to

[click to enlarge](#)

compile a water sustainability analysis for Hawai'i Island. Over the past three years, Yale has conducted baseline research on the island's waste stream and energy system. In 2006 the Yale team worked with the Center and with the County government to produce the [Hawai'i Island Energy Sustainability Plan](#), which was officially adopted by the County in 2007. The Yale team is now focusing its attention on characterizing the island's water system, including: ground and surface water resources, current water usage, water-related energy usage, and existing water delivery infrastructure. Drinking water, agricultural water, and wastewater are, for the most part, regulated by different entities, including the County Department of Water Supply, the County Department of Environmental Management, the State Department of Agriculture, and various private landowners. By taking a systemic look at water and energy flows on the island, the students are connecting these systems together to identify possibilities for resource conservation. For example, wastewater reuse 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 rapidly, so do the benefits of using these resources wisely.

"As much as 5% of all the energy used on the island is utilized to pump water. In order to sustain the water system on this island, we need to quantify the real costs of maintaining this system, consider alternatives to reduce these costs and conserve resources, and build resiliency into the system in case of pollution of an aquifer or an interruption in energy flows." - Jake Iversen, Masters candidate in Environmental Management at Yale University and co-author of the current water study

[Learn more](#) about the Yale study and about its authors, Zeke Fugate and Jake Iversen.

Many Pressing Issues

Photo: [Waimea Transfer Station](#) photo courtesy of the [Department of Environmental Management website](#).

The County is seeking public input on its [Integrated Solid Waste Management Plan](#) (ISWMP). The next ISWMP will make recommendations regarding future recycling and composting programs and long-term disposal solutions for non-recycled waste on the island. For more information contact Mike Dworsky, Solid Waste Division Chief, at 808-961-8515.



Seed Money

The Kohala Center in cooperation with 'Ano 'ano Aloha has received \$30,000 in seed money to flesh out a business plan for a proposed Institute for Pacific Design. The Institute will serve as a think tank, testing ground, consultant pool, training facility, and enterprise generator for sustainable designs and practices for Hawai'i Island. The Institute will engage Hawaiian and Western traditions to create green designs and implement green practices on the island. Key collaborator is 'Ano 'ano Aloha (literally "the seeds of life"), an island-based non-profit whose mission is to merge the spiritual legacy, values, and sustainable practices of the Hawaiian ancestors with the arts, humanities, and sciences to create greater socio-economic opportunities for Hawai'i's communities.

The missions of TKC and 'Ano 'ano mesh perfectly in the business planning process for the new Institute. Initial funding was awarded by the Office of Hawaiian Affairs' Community Based Economic Development Program. Look for more details about the Institute for Pacific Design to be unveiled in the coming months.

[Read an interview](#) with Matt Hamabata, TKC Executive Director, and Lani Yamasaki, founder of 'Ano 'ano Aloha by Kristine Kubat of Big Island Weekly.

Local Students Lead the Way



Photo: Jacob Osborne (left) and Terran Stephans (right), Student Sustainability Congress participants from Kea'au High School, enjoying a lunch comprised entirely of locally grown foods.

"I believe the Go Green movement can be best led by the children, and so far, they've been the driving force behind our progress at HPA. This should work at other schools, too, I think!" - Ole Jorgenson, outgoing Headmaster of Hawai'i Preparatory Academy (HPA)

From June 8-11, HPA hosted students and teachers from public, private, charter, and parochial high schools from around Hawai'i Island at the first-annual Student Sustainability Congress. All participants attended free of charge, thanks to the largesse of businesses and individuals in the community. Participants were selected by each school, and they spent four days in residence at HPA's Waimea campus, working with local experts in sustainable design, agriculture, transportation, and education. Students attended a variety of hands-on workshops in which they learned how to build a compost pile, calculated their global footprint, experimented with solar panels, tested the quality of the water at some local beaches, and converted a diesel engine to run on used cooking oil. On one day of the conference, they ate only foods locally grown on Hawai'i Island.

The hope is that these young leaders will return to their homes and schools and share with their peers the sustainable practices they learned about at the Congress. Participants also had plenty of opportunities to network with students from other schools and to think about how they might collaborate in the future. HPA Congress organizers have high hopes for these young people, "whose legacy it will be to lead Hawai'i in reversing our current irresponsible management of our environmental resources," says Jorgenson.

Read reflections on the Congress from two high school sophomores, Terran Stephans from Kea'au High School and Sydney Waitz-Kudla from HPA.

Summertime!

Photo: School garden leaders examine seedling differences in the greenhouse at Nancy Redfeather's Kawanui Farm.

Nancy Redfeather, School Gardens Network Project Director for The Kohala Center, is working tirelessly to reinvigorate local food production on Hawai'i Island - starting with our youngest residents. School garden leaders from around the island gathered at Redfeather's farm this summer, for two days of gardening demonstrations, exchanging ideas, and enjoying the fruits of the land. This group shares a vision for a more self-reliant future for the island, in which we work together to feed ourselves. At the end of the workshop, garden leaders departed for their home campuses, energized for the start of a new school year and a new round of young gardeners. For more information about the Hawai'i Island School Gardens Network, or to volunteer at your local school garden, please contact Nancy Redfeather at nredfeather@kohalacenter.org or call The Kohala Center office at 808-887-6411.



Venture off the Beaten Track



Photo: Kohala Center members spy a Hawai'i 'Akepa or Hawai'i Creeper in the Hakalau Forest canopy, both endangered species. Photo by Sam Birch, Kohala Center Program Services Coordinator.

"Recently I had the humbling experience of walking hand in hand with nature at Hakalau Forest as expert Jack Jeffrey shared his knowledge of the land and some of our endangered Hawaiian birds. What a magical place!" - Cindi Punihaole, Kohala Center Outreach and Volunteer Coordinator

"The Hakalau trip was delightful. Jack Jeffrey regaled us with tales and conjured up dozens of birds. With his patient and insightful coaching even I was able to spot the immature 'Akepa begging food from its busy parent. For me it was the first time bird watching has amounted to more than occasionally glimpsing shadowy forms in the canopy." - Priscilla Studholme, outdoor enthusiast and member of The Kohala Center's Circle of Friends

Photo: The Hawai'i 'Akepa is endangered, endemic to Hawai'i Island, and is one of the smallest of the Hawaiian honeycreepers. The male is day-glow orange and the female is green with a yellowish-orange wash on the breast. It is the only honeycreeper that nests in tree cavities. Photo by Jack Jeffrey.



Take time to experience our 'aina with fellow members of The Kohala Center's Circle of Friends. Join us for these upcoming learning events:

- **Saturday, August 26** - Explore the dry-land forest of Ka'upulehu with naturalists and oral historians Yvonne and Keoki Carter.
- **Saturday, September 13** - Hike through protected dry forest and rainforest habitats of Kohala with conservation biologist Melora Purell of the Kohala Watershed Partnership. This is your opportunity to visit areas which are privately owned and generally inaccessible to the public.
- **Sunday, October 5** - Take a boat trip with experts from the Manta Pacific Research Foundation and Jack's Diving Locker. Snorkel or dive with the manta rays and experience the beauty of these gentle giants.

"These events are totally engaging, educational, and especially fun!" says Punihaole. Limited spaces are still available, reserve your place now. Call Molly Hui at 887-6411 or email mhui@kohalacenter.org.

Onshore Soon



Photo: Clients about to go snorkeling from a tour boat offshore of Kona. Photo courtesy of Carlie Wiener.

The U.S. Coral Reef Task Force will hold its 20th annual meeting on Hawai'i Island from August 24-29. The Task Force is co-chaired by the Departments of Commerce and of the Interior and includes leaders of twelve federal agencies, seven U.S. states and territories, and three freely associated states. The meeting features a series of workshops, evening receptions and lectures, an awards luncheon, and field trips. The community is invited to join in the various events and learn more about watershed planning, traditional ecological knowledge in Hawai'i and across the Pacific, and marine resource stewardship. All workshops are free and open to the public, and tickets are available online to the fee-based events. Most events are held at the Keauhou Beach Resort in Kailua-Kona.

One featured event is a free marine recreation workshop on Monday, August 25, from 8 am to noon.

Whales Breaching for a Cause: Green Marketing and Education for Hawai'i's Marine Environment will provide an overview of unique issues that the marine tourism industry faces in Hawai'i, as compared to its counterparts in other parts of the world. Facilitators from the State Division of Aquatic Resources will discuss the diversity of recreational activities in Hawai'i and the potential impacts of these activities on each other and on local ecosystems. The workshop will also cover green marketing strategies, including innovative ways to reach audiences with new information and educational techniques. Participants will learn how to enhance their clients' learning experience by interpreting Hawai'i's unique cultural and natural resources. For more information, contact Carlie Wiener, Northwestern Hawaiian Islands Research & Outreach staff person for the Hawai'i Institute of Marine Biology, at cwiener@hawaii.edu.

Volunteers are needed to help out with the various events: to volunteer, contact Jill Komoto at the State Division of Aquatic Resources at jkomoto@gmail.com. For more information on the U.S. Coral Reef Task Force and its initiatives, or to register for any of the various events, visit www.coralreef.gov.

[Back Page](#)



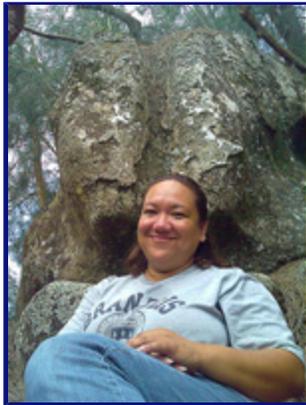
**July/August
2008
Back Page**

[Subscribe](#)

The First Cohort of Fellows

Statements from the 2008-09 Mellon-Hawai'i Fellows

Doctoral Fellows:



Noelani Arista, Ph.D. candidate in the Department of History at Brandeis University

Photo: Noelani poses along the Palehua Trail in the Makakilo area of O'ahu.

This spring I served on a hiring committee as the History Department recruited a second Hawaiian historian, a critical step in crafting the only Ph.D. program in Hawaiian History offered in the world. I am now one of two Hawaiian historians in the History Department at UH Manoa. (*Note: In 2007 Noelani accepted a position as Acting Assistant Professor in the History Department at the University of Hawai'i at Manoa.*)

Working under Hawaiian elders for much of my training, I was taught that it was my *kuleana* (responsibility) to pass on the knowledge with which they entrusted me. As a history professor responsible for teaching surveys of Hawaiian history, I will collect primary source materials written in Hawaiian and work with colleagues to translate these to make them available as course readers. Over the next few years I plan to publish several much-needed bilingual primary source textbooks for Hawaiian history. I intend to develop new graduate and undergraduate courses on the Pacific World, New England, and Hawai'i, and on American missions in the Pacific. At the graduate level, I will introduce a course in research methods, training students to read Hawaiian language sources in culturally consistent ways. In order to foreground Hawaiian knowledge and intellectual traditions, I will teach a class conducted in Hawaiian on Hawaiian intellectual history.

Service will play a large part in my career as a professor. I also want to mentor and advise history students, especially students of color and Native Hawaiians. Fostering within students a sense of the long and robust history of Hawaiian intellectual traditions will, I believe, provide a great service to the Hawaiian community. In my scholarship, teaching, and service, I must fulfill this responsibility, and I look forward to completing my doctorate and moving ahead to this part of my career and my life.

Nanette Nalani Sing, Ph.D. candidate in Interdisciplinary Studies with a Concentration in Educational Leadership/Systems from Union Institute & University in Cincinnati, Ohio

Photo: Nalani embracing her "precious *mo'opuna*" (grandchildren).



I am committed to continue to serve the Hawaiian community and society as a whole by sharing my knowledge and experience with school administrators. It is my hope that my doctoral research project will have a positive impact on school principals who will re-examine their leadership styles and integrate Hawaiian cultural values into their daily practices and behaviors. The results from my research study will be shared with the Department of Education in an effort to impact effective changes in the school administration training program for aspiring school leaders. In addition, my research will add new knowledge to the field and the educational community.

Each year, as increasingly more schools are taxed with the demands of federal and state initiatives, school administrators will need to seek innovative ways to develop professional learning communities and develop interdependent systems of operation in the school environment that impact academic and social change. Looking at implementing culturally appropriate instructional strategies and alternative forms of assessment will be a major shift for the educational system.

Having worked at all levels of the education system, I believe that I can be a catalyst for systemic change by promoting leadership and instructional practices that integrate Hawaiian cultural values in the school environment. Acculturating school leaders will be a challenging task, however, this is where the change needs to occur if it is to be systemic and sustainable.

The educational system needs to recognize the talents, strengths and potential of our Native Hawaiian children and provide opportunities for them to be successful. Schools should embrace Hawaiian cultural values and create relevant instruction and assessment that will result in a sustainable culture for learning to benefit all children in Hawai'i.

Postdoctoral Fellows:



B. Kamanamaikalani Beamer, Ph.D. in Geography from the University of Hawai'i at Manoa in May 2008

Photo: Kamana successfully defending his dissertation.

After I completed my B.A. at UH Manoa I moved to Hawai'i Island to spend time with my *tutu* (grandmother). This experience prepared me for the places that I am entering today. Living with a Hawaiian *kupuna* (elder) in your mid-twenties can be a humbling experience and one that causes self-reflection. Through this experience I learned about what it meant to be *'Oiwi* (native) and what it means to *malama* (care for). I was able to take many of the things that I had learned in Hawaiian Studies and language class and have discussions with her about them. We spent long hours together speaking about her grandparents and parents and the ways they had shaped her life. These discussions made me realize the role that my *kupuna* played and the *kuleana* (responsibility) that I had to live up to...

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. I feel that my experiences in Hawaiian communities, through my family, volunteer work, and by participation in social justice rallies have offered me insight into many of the struggles that Native Hawaiians are facing and also insight into ways in which my work as a scholar can aid these communities. I have attempted to be rigorous in my

work as a scholar and equally rigorous in attempting to conduct research that is of value to the Native Hawaiian community. My driving force is trying to follow the words of my tutu, to "be the best damn Hawaiian" that I can be.

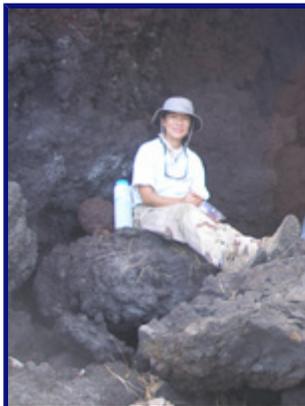
Sydney Lehua Taukea, completing a Ph.D. in Political Science from the University of Hawai'i at Manoa

Photo: Sydney last summer in Victoria, Vancouver Island, Canada on a hike "hugging a tree." She was helping to organize an Indigenous Politics course between the political science departments at the University of Victoria, British Columbia and the University of Hawai'i, Manoa.



I am a Native Hawaiian scholar dedicated to contributing to the overall wellbeing of our people through education. I have taught 22 courses thus far in the Political Science Department, University of Hawai'i at Manoa, and in that time I have learned that knowledge is indeed power. As a teacher I am committed to presenting and discussing Hawaiian Kingdom governance from a Native epistemology of our *kupuna* (elders). I teach my students that Hawaiians are intelligent political actors, both in local and international affairs, starkly contradicting colonial notions and portrayals of victimized beings. There is indeed a whole history to be relearned at present, one that I never encountered while growing up here. This knowledge can only empower us in the present as we continue to discuss models of sovereignty and community building projects.

I see my role as a teacher as an extension of my commitment to the wellbeing and growth of both the Hawaiian community and of society. Volunteer work is part of my makeup as an individual and part of my *kuleana* (responsibility) as a Hawaiian. The work I am doing now with environmental initiatives is only the most recent example of raising awareness in these areas. I remain committed to the organizations that help us preserve our presence on the *'aina* (land) and in *ke kai* (the ocean), such as Save Our Surf and the Defend O'ahu Coalition. These organizations seek to preserve open spaces and access to our surf sites for the Hawaiian community and for all residents of these Islands. By involving myself directly with these organizations, I am able to translate my scholarly work to legislative and community service initiatives.



Kathleen L. Kawelu, Ph.D. in Anthropology from the University of California at Berkeley, May 2007

Photo: Kathy taking a break from her field work in leeward Kohala earlier this summer.

I see archaeology as one way of learning about Hawaiian history, in addition to our traditional methods. I study the practice of archaeology in Hawai'i because it is a way to hold archaeologists accountable and to make archaeological work relevant to Hawaiian communities. A few negative experiences during my graduate career have influenced my scholarly development. In one instance, during graduate school an Anthropology professor questioned the validity of Hawaiian as an academic language and resisted my attempts to satisfy a Departmental language requirement using Hawaiian. He suggested a

Romance language would be more appropriate for such an exam. Fortunately my advisors argued for the legitimacy of my choice, and I was able to use Hawaiian to satisfy this requirement.

In another instance, I applied for grant monies through a University of California research group to support the ethnographic work in my dissertation research. As part of that grant proposal I requested monies which would be used to purchase small gifts (*makana*) for the people I interviewed. In my grant proposal I explained that in Hawaiian culture it is proper etiquette for guests to bring gifts, most commonly food and drink, when visiting at someone's home or making a request on an individual's time. I was awarded the grant; however, the committee stipulated that the money was not to pay for "gifts to natives" and that I include such funds under the supplies category in my budget.

What I took away from these experiences was the realization that these particular anthropologists truly did not understand or appreciate Hawaiian culture. For all the years of study, and the theoretical discussions about "other" cultures, these individuals still viewed Hawaiian culture as sub-par. While I experienced these events negatively, the result was actually positive, because the incidents clarified my purpose for pursuing a degree in Anthropology: to challenge such Eurocentric notions. This recognition contributed to my participation in indigenous archaeology, which critically examines the practice of Anthropology and Archaeology, advocates for more respectful researchers, and encourages the training of more native peoples in these disciplines.

A Five-Year Plan

Photo: A reservoir tank being filled by truck, with an ironic leak, somewhere along the Hamakua Coast, back in March 2007. Photo by Jake Iversen.



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

1. **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.
2. **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.
3. **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.

Look for preliminary recommendations from their report, *"Water, Food, and Energy on the Island of Hawai'i"* at www.learning.kohalacenter.org later this year.

Read more about the authors, who are spending the summer on Hawai'i Island gathering data for their report, below.

Meet Zeke Fugate



Photo: Zeke Fugate working on the list of environmental indicators for the Hawai'i water study.

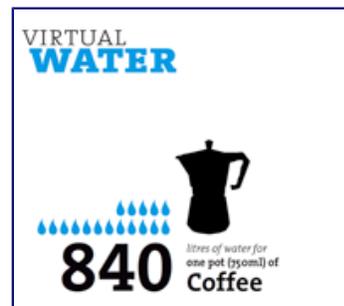
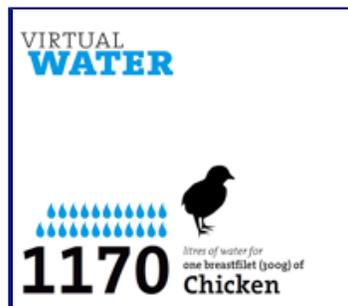
"I was born and raised in the Appalachian Mountains of southwestern Virginia. Growing up in a family of educators, nurses, engineers, and farmers equipped me with a wide array of interests and a hard-earned appreciation for practicality, curiosity, and compassion. Gardening and yoga keep me occupied when my nose is not buried between the pages of a book. I also love to ride my bicycle regardless of climatic conditions. I graduated from the University of Virginia with a B.S.

in Civil Engineering and a B.A. in Mathematics, both with highest honors. I recently completed my first year of graduate school at Yale University where I am working towards my Ph.D. in Environmental Engineering.

My academic interests are centered around water-related issues, from point-of-use water treatments for developing countries to the design of sustainable urban infrastructure. My past research has investigated the efficacy of a plant-based coagulant for water treatment, and while I am still very interested in appropriate technologies, my current and future endeavors are focused more on the study of large-scale water systems. My dissertation research is part of a collaborative project to model the impacts that climate change and other compounding factors will have on water quantity, quality, and availability in the Great Lakes Basin.

The project we are working on this summer is the continuation of a collaboration between the Center for Industrial Ecology at Yale and The Kohala Center that has produced studies on energy issues and material flows on Hawai'i Island. Currently, we are building an analytical framework that can be used to benchmark existing water systems and evaluate the relative sustainability of planned water projects on the island. The framework considers all aspects of a water system from source water extraction to wastewater discharge and/or reuse. While it is not meant to be exhaustive in scope, it is intended to contextualize water issues, increase the transparency of water system operations, promote the protection of natural resources, and provide useful information for decision makers. For example, it may be less expensive and less energy intensive to provide a community with drinking water from a surface water source than to pump water from a deep and/or distant groundwater source.

The three pillars of sustainability – society, economy, and environment – are all emphasized in an effort to expand the decision making process from one that is strictly focused on financial issues. Ensuring that the non-monetary aspects of a project are adequately represented will help move Hawai'i Island towards a more sustainable future."



Images: Virtual water is the amount of water required to produce a commodity or service in a given location. The virtual water content of goods and services can be calculated from water consumption and trade data. Virtual water estimates are a good basis for calculating how much water Hawai'i Island will need to replace imported products. The chicken calculation, for example, includes water required to grow the chicken's food (assumed to be grain), water required for drinking, water required to clean and maintain the chicken farm, and water required for processing the meat into a usable form. Graphics from <http://www.traumkrieger.de/virtualwater>.

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."

Meet Jake Iversen

Photo: Jake Iversen working on his laptop and consuming water resources.



"I am a second-year Master's student at the Yale School of Forestry and Environmental Studies, and the emphasis of my degree is on green design and industrial ecology; these boil down to building things so that they pollute less and use fewer resources over their lifetime.

Interestingly, my undergraduate degrees, from UC Davis, are in History and Japanese Language and Culture. I came to the environmental field by chance - through a job that my roommate, a lab tech, offered me after I graduated. It turned out to be a lot more fun than attempting to teach English in Japan (which I tried for a year) or attempting to start a career in California's rapidly-deteriorating school system. I like what I'm doing now a lot more, as I've always been interested in where stuff comes from, what it's made out of, and what happens when you take it apart and then throw it away. In this field, I get to think about that on a huge scale.

I am pretty much working on the same project as Zeke, albeit a different part of the system. He's currently trying to put together maps of the existing water systems and calculate their energy consumption numbers, while I'm trying to figure out how much wastewater is produced, reprocessed, or lost, and how much fertilizer the island imports.

I guess I should state how we are approaching our analysis philosophically (or maybe ideologically). As I see it, the problem with government policy is usually that it only sees things in terms of how much one good costs. So people only ever pay attention to, say, the price of 1000 gallons of water. But no good exists in a vacuum. It took metal and concrete to build the well and pipes for the water, it took electricity to pump it up, and it took diesel fuel to make the electricity. Those things are in short supply here, and using them means that they can't be used for something else. Then there are other, less material resources, usually called "capacities": the amount of wastewater you can dump into the ground before people get sick; the amount of water you will have in the future; the price you will have to pay to keep the current system running for a few decades; the quality of the forests and beaches that tourists pay to come and see.

Table: The County of Hawai'i is currently consuming almost ten billion gallons of water every year, and its residents are paying, on the average, less than \$3 for every thousand gallons. In 2007 the Department of Water Supply (DWS) collected roughly \$39,000,000 in revenues from water sales. For Fiscal 2007, however, DWS proposed a \$41,000,000 budget, with an additional \$27,000,000 for Capital Improvement Projects - or nearly \$30,000,000 more than their sales revenues. The table below first shows the current price of water plus the power cost that is factored into every water bill (water users pay directly for the electricity used to pump water). It then shows what would happen if users directly paid for some of the other costs of maintaining the water system. This table illustrates that the price of your monthly water bill does not reflect the actual cost to society for providing you with water. Table and caption by Jake Iversen.

Price of Metered Water	\$0.75 / 1000 Gallons
...plus power cost charges	2.35 / 1000 Gallons

Fiscal 2007 DWS Budget Request Costs for

...materials, supplies and services, \$ per 1000 Gallons	2.21 / 1000 Gallons
...plus personnel services	3.42 / 1000 Gallons
...plus equipment	3.47 / 1000 Gallons
...plus debt service and payments to the CIP Reserve	4.16 / 1000 Gallons
...plus Capital Improvement Projects to...	
...replace waterlines	4.73 / 1000 Gallons
...repair and maintain existing facilities	5.28 / 1000 Gallons
...upgrade systems	5.48 / 1000 Gallons

*Figuring out what water actually costs involves analyzing a whole lot more factors than what you might expect. Figuring out how much **anything** really costs involves figuring out how many resources are being consumed, not just the amount of money paid to buy, build, and maintain the flow of water.*

As far as I can tell, the Hawai'i County DWS, like every utility in the country, only charges a small fee for water, to keep the price low so everyone can afford it. Their other costs are paid with tax money or loans that are serviced with tax money. California is the same way: most water sources are maintained by the federal government and the State and paid for with general tax funds. Otherwise, San Diego and Los Angeles would never be able to exist. In fact, most resources around the world are subsidized one way or another: Europe keeps diesel fuel artificially low so truckers won't strike, for example.

Because of the subsidies, people don't understand how much water really costs. Our analysis is attempting to reflect what water actually costs all of society, so that people realize that lowering their use will reduce the need for everyone to pay the subsidies. Greater efficiency will result in savings in other places.

We're essentially trying to figure out what are the cheapest alternatives, in terms of all of the different components, for the water systems on the island. That sounds more like a doctoral thesis than a summer project, but we're going to do at least the first run of the work, which Yale and The Kohala Center plan to continue to develop over time."

Making a Difference

By Terran Stephans, Kea'au High School sophomore and Student Sustainability Congress participant



Photo: Terran Stephans (**right**) learns how to convert a car engine to run on biodiesel fuel with HPA mentor Jerry Shumate (**left**).

I was interested in environmental sustainability before I attended the Congress, so I thought this'd be a really good opportunity for me, studying the things I like to study, pursuing this topic that I'm interested in. I went and it turned out to be a good experience. I gained a lot of knowledge from the Congress, and I learned not from books, but from hands-on experience and from other people's experiences, which is definitely quite a turn for me. I'm so used to a linear sequence of learning, which I'm not even sure I can call learning anymore. This learning pattern is so boring I almost forget the content that I learned by the next day, if I learned much of anything.

The entire stay at HPA was a vivid, colorful experience. I got to network with other kids from around the island. I got to see how their schools did things, I got to discover a variety of different personalities, and I gained even more knowledge and inspiration as well. Seeing so many people pursuing a common goal, to help sustain our environment, was a very cool, moving experience.

One thing we did that sticks in my head was a class on the mass dolphin deaths caused by tuna fishing. We learned about what types of nets were used, what the conflicts were surrounding this issue, and we concluded with how teens like us stopped this mass dolphin fishing and killing as "bycatch" of species unintentionally fished and usually killed due everything they're put through. The teens spoke up, made a difference, and now it's illegal to sell a net of tuna when one dolphin is killed in the process of catching the fish. It used to be that thousands of dolphins were killed.

After the Congress I was inspired to do research on what methods I can use to convert my mother's car (after checking that she wouldn't kill me first) into a more sustainable, fuel-efficient vehicle. It's too bad she doesn't own a diesel vehicle, since there's a Verna's Drive In right down the road with plenty of used frying oil. Converting a car to run on frying oil, or vegetable oil, is one of the many things I learned at HPA. After I reach that goal, which I guess could be considered my summer project, I can take that knowledge and start a school project to convert a car as well. After this, we might even work on alternate energy sources for Kea'au since their electric bill is so remarkably high due to rising energy costs.

I'm not quite sure how HPA did it, but I really appreciate all the trouble they went through to make this free to the students. I might not have been able to go if this hadn't been made free of charge for everyone, so I really appreciate that. Thanks to the guys who put this together for us students, because this does need to be done.

More Than I Expected

By Sydney Waitz-Kudla, sophomore at Hawai'i Preparatory Academy and Student Sustainability Congress participant

Photo: Sydney Waitz-Kudla examines a worm composting bin provided by Piper Selden of [Hawai'i Rainbow Worms](#).

During the Congress I learned more than I expected to. I never knew there was so much I could do to help the environment. I came away from the Congress with the knowledge that we have the power here on the Hawai'i Island to sustain ourselves. I also know that we need to stop relying on so many outside sources.



I learned that we have a lot less time to save this world than I expected. I thought we had plenty of time, not just thirty to forty years. This timeframe was from [The 11th Hour](#), a movie we watched at the Congress.

I know now that we have to do all we can to save ourselves. We will not succeed if only a few of us set out to help the environment. We need a global effort. However, there are so many little things to do that can help. We can compost our leftover food, instead of just throwing it away, we can be more responsible about the energy we use for our homes, and we can raise awareness about our environment. Go Green!

One of my favorite activities was the "Are You Smarter Than a 5th Grader?" workshop led by Andrea Dean. It involved the students in answering questions about the Hawai'i Island and about sustainability around the country. One question that stuck in my head was: "What percentage of the food we eat on the island is processed?" The answer was 85 or 90 percent. I'm not sure exactly which, but it was really high. She also asked us how many gallons of soda the average American drinks per year. I believe the answer was thirty five gallons.

The Congress did not make me change my mind about what I want to study in college. I already wanted to pursue a career in environmental and human, animal, children, and women's rights' law.

[Front Page](#)