Beach Nourishment at Waikīkī Beach

Ka Pili Kai is funded by a grant from the University of Hawai‘i Sea Grant College Program Act of 1966.

The Center for Sustainable Coastal Tourism (CSCT), one of UH Sea Grant’s five Centers of Excellence, is dedicated to advancing sustainability practices that promote economic development while at the same time minimizing our environmental footprint and encouraging stewardship of our island and coastal resources. Since its inception in 2009, Dr. Denise Konan, Dean of the College of Social Sciences and Director of the CSCT, has been leading this groundbreaking new center and seeking out innovative projects that will help the state become a global leader in sustainable coastal tourism. In this issue I invite you to read about a sand replenishment project in Waikīkī and its importance to the future of the island.

Cindy Knapman
Communications Leader

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The University of Hawai‘i was designated a Sea Grant College in 1972, following the National Sea Grant College Program Act of 1966.

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On the cover: Residents and visitors to Hawai‘i enjoy a picture perfect day at the Hanauma Bay Nature Preserve. For over 20 years the award-winning UH Sea Grant Hanauma Bay Education Program has promoted understanding and stewardship of Hanauma Bay, and has become a successful model on how to balance the needs of the expanding visitor industry with the conservation of natural resources.

1 http://www.waikikibid.org

Beach Nourishment at Waikīkī Beach

W aikīkī Beach is a globally recognized icon of Hawai‘i and is the state’s largest tourist destination. Waikīkī generates approximately 42 percent of the state’s visitor industry revenue and is responsible for eight percent (five billion dollars) of the gross state product. Beaches are a primary attraction for visitors to Waikīkī and it has been estimated that Waikīkī Beach accounts for approximately two billion dollars in annual income for the local economy. Waikīkī Beach also has tremendous cultural significance as a former playground of Hawaiian royalty and the birthplace of the sport and culture of surfing. The beaches and the myriad of world-renowned surf breaks located offshore are unique and valuable natural resources that support the culture and lifestyle of Hawai‘i, and the idyllic image of Waikīkī.

Waikīkī Beach is a highly-engineered urban shoreline. The modern configuration of the beach is largely the result of past engineering efforts (e.g., groins, seawalls, and sand fill) intended to widen the beach. Due to the natural process of beach erosion, lack of coordinated management, and lack of capital investment, many sections of Waikīkī Beach have experienced substantial narrowing or have been completely lost to erosion. Beach loss results in a variety of negative economic, social, cultural, and environmental impacts.

The Office of Conservation and Coastal Lands (OCCL), a division of the State Department of Land and Natural Resources (DLNR), is the lead agency regulating land use and development activities in Hawai‘i’s shoreline and marine waters. In 2003, UH Sea Grant partnered with OCCL to create the Coastal Lands Program. Through this ongoing partnership, UH Sea Grant extension faculty provide

1  http://www.waikikibid.org
Recognizing the negative impacts of erosion in Waikīkī, OCCL began experimenting with beach nourishment in 1999. In 2006, with assistance from UH Sea Grant extension faculty, OCCL conducted a pilot project to test the effectiveness of offshore sand recovery and pumping technology in preparation for future beach nourishment projects. The project was successful in restoring approximately 10,000 cubic yards of sand from offshore deposits to the beaches in the swim basins at Kūhīo Beach Park. In 2012, based on the lessons learned through these past beach nourishment efforts, OCCL conducted the first large-scale beach nourishment project in Waikīkī in over 20 years.

In 2012, OCCL partnered with the Hawai‘i Tourism Authority and Kyo-ya Hotels and Resorts to restore a valuable and heavily utilized portion of Waikīkī Beach by recovering approximately 27,000 cubic yards of marine sand, some of which had likely eroded from the shoreline over time. The goal of the project was to widen the beach by approximately 30 feet along the 1,730 foot project area extending from the west end of the Kūhīo Beach Park swim basin, near the Duke Kahanamoku statue, to the existing Royal Hawaiian groin between the Royal Hawaiian and Sheraton Waikīkī hotels.

Since 1985, the project area shoreline has experienced significant beach loss due to long-term erosion. In some areas, particularly during high tides and high surf events, there is no dry beach which creates a safety hazard for beachgoers, and damage and inundation of beachfront hotels and the lifeguard facilities. The state has recognized that given the chronic erosion potential, simply importing sand is not a sustainable or environmentally-sound solution. There is a need to develop a program for regular beach maintenance using nearshore sand as a means for periodic beach nourishment.

After studying the historical geomorphology of Waikīkī and evaluating the results of previous beach improvement projects in the area, OCCL and Sea Engineering, Inc. designed a maintenance plan to dredge beach-quality sand from a channel in the nearshore reef and pump it back onto the beach. This “recycling” program offers a more efficient method for maintaining a recreational beach while mitigating some of the environmental effects of imported sand to the Waikīkī ecosystem over the past sixty-plus years.

UH Sea Grant extension faculty were actively involved in all aspects of the project including scoping, permitting, construction, monitoring, and outreach. Construction activities included site preparation, sand recovery, dewatering, and sand placement. Site preparation involved mobilizing equipment, setting up the construction site, and installing the pipeline to support sand recovery operations. Sand recovery involved pumping sand from deposits located 1500-3000 feet offshore to a dewatering basin constructed inside the nearby Kūhīo Beach swim basins. The dewatering process filtered and dried the sand in preparation for placement. Dried sand placement was completed by hauling sand using articulated dump trucks.

Environmental monitoring included daily water quality monitoring conducted by a sub-contractor, beach profile monitoring by the University of Hawai‘i’s Coastal Geology Group, and time-lapse photography provided by the Pacific Islands Ocean Observing System (PaIOOS).

In addition to supporting planning, construction, and monitoring activities, UH Sea Grant extension faculty coordinated an extensive project outreach campaign. Outreach activities prior to construction included extensive stakeholder meetings, press releases, and blessing ceremonies. During construction, outreach consisted of daily project updates via multiple websites, including Facebook, the Hawaii Ocean Safety, and OCCL websites, press releases, posters, signage, and media interviews. Upon project completion, a final press release was issued and a time-lapse video documenting the entire construction process was published on multiple websites including YouTube and Vimeo.

Conducting a large-scale construction project on one of the most popular beaches in the world presented a variety of challenges, ranging from potential socio-economic impacts of beach closures to public safety hazards. There were also logistical challenges, including equipment failures, limited available working hours, adverse ocean conditions, and water quality concerns. Coordinating a large group of stakeholders presented unique challenges for management and outreach. Active stakeholder engagement and proactive outreach emerged as critical components that should be initiated very early in the planning process.

The project was ultimately successful in restoring approximately 30-40 feet of beach width and received an Outstanding Civil Engineering Achievement award from the Hawaii Section of the American Society for Civil Engineers. The benefits of “recycling” sand through the sand recovery process minimized the risks of further sedimentation and habitat degradation associated with introducing non-native sand into the beach and reef environment.

Next steps for this project include continued beach and nearshore environmental monitoring, and continued outreach through presentations and publications. Another round of beach nourishment is planned for Waikīkī Beach around 2022. In the meantime, UH Sea Grant is partnering with OCCL and other community stakeholders to develop a Comprehensive Beach Management Plan for Waikīkī that will help prioritize, guide, and coordinate beach management projects in the coming decades.
For large buildings and hotels, particularly in tropical climates, air conditioning represents the single major source of energy demand and cost. An estimated 42 percent of energy consumption by the hotel industry in Hawaii is used for air conditioning compared with 34 percent for business office buildings. By harnessing the cooling properties of deep seawater, it is possible to significantly reduce the energy demand for air conditioning.

Seawater air conditioning (SWAC) works by pumping cold (44-45°F), deep (1,600-1,800 feet) seawater to a cooling station. Here, the cold seawater is used to chill fresh water for air conditioning purposes. By using SWAC, electricity demand for air conditioning could be reduced to around 4,800 megawatt-hours per year, an efficiency improvement of almost 90 percent. Given that 90 percent of the state’s electricity needs are met by the burning of fossil fuels, SWAC has the potential to both save money and reduce greenhouse gas emissions. Traditional air conditioning is also very water intensive with millions of gallons of fresh water lost each year to evaporation. SWAC uses significantly less fresh water and a SWAC system in Waikiki would likely save about 100 millions of gallons of fresh water a year.

The University of Hawaii’s Sea Grant College Program (UH Sea Grant) Center for Sustainable Coastal Tourism collaborated with the Economic Research Organization at the University of Hawai‘i and the Center for Microbial Oceanography: Research and Education in the School of Ocean and Earth Science and Technology to investigate the potential for installing a SWAC system in Waikiki. As part of the research project, UH Sea Grant conducted a survey of over 500 O‘ahu residents soliciting their opinion of SWAC. The survey found that a majority of O‘ahu residents support the idea of developing a SWAC system for Waikiki with 28 percent of O‘ahu residents strongly supporting the idea and a further 34 percent supporting the concept. Only 8 percent of respondents oppose the idea (4 percent of whom oppose strongly) and the remaining 30 percent neither support nor oppose.

Half of the survey respondents had not heard of SWAC prior to receiving the survey booklet. As might be expected, people who had heard of SWAC prior to receiving the survey were more likely to support its development than people who were not familiar with the technology. This is a positive finding for SWAC development as it indicates that increased awareness and understanding of SWAC result in increased support and that the information people have received to date typically engenders a positive attitude toward SWAC.

After stating whether they support or oppose SWAC development in Waikiki, respondents were asked to briefly provide a reason for their answer choice. Among supporters of SWAC, key reasons for support include: a belief that SWAC will be more cost-effective; an understanding that SWAC utilizes a renewable resource, saves energy, reduces fossil fuel use, and will thus contribute towards Hawai‘i being more energy self-sufficient; and an acknowledgement that it simply makes sense to implement SWAC in a place like Hawai‘i.

Understandably, people who did not support SWAC were primarily concerned about whether SWAC might negatively affect the ocean. A few people were worried about what impacts SWAC might have on local residents and whether locals would receive any benefits from the installation of a SWAC system. The potential cost of SWAC development was also stated as a reason for opposition. Given that the idea of building a SWAC system in Waikiki is still in its early stage, it is difficult to know the exact impacts of such a project. As with any large-scale project, there will likely be some temporary disruption to traffic during construction but it is quite possible that any environmental damage could be avoided or mitigated almost entirely depending on project design.

In summary, despite these concerns, the majority of O‘ahu residents support SWAC development in Waikiki and believe that SWAC will save energy and help reduce Hawai‘i’s dependence on fossil fuels.
Hanauma Bay Education Program

Hanauma Bay is a world-renowned marine conservation area, famous for its spectacular scenery and for being home to some of the most colorful and unique marine life in the world. Hanauma Bay’s natural beauty is the very reason why nearly one million visitors visit the bay annually. The Hanauma Bay Education Program (HBEP) is a project of the University of Hawai‘i Sea Grant College Program (UH Sea Grant) that achieves conservation through education. The Hanauma Bay Education Program provides appreciation and stewardship of Hanauma Bay’s natural resources through educating visitors about Hawai‘i’s marine environment. For the past 20 years, HBEP has educated millions of visitors about the bay’s ocean life, reef etiquette, natural history, and value to the Hawaiian culture. The scope of the education program has grown from humble beginnings as a grassroots community effort to a comprehensive visitor education program.

**Program Evolution**

In 1967, the State of Hawai‘i declared Hanauma Bay the state’s first Marine Life Conservation District (MLCD). Over the years, Hanauma Bay’s popularity grew to unsustainable proportions. During peak periods in the late 1980’s, the nature preserve experienced as many as 10,000 visitors per day, which translated to three million visitors per year. Hanauma Bay’s natural resources were heavily impacted by overuse and a lack of knowledge by users regarding actions they could take to protect the bay.

In 1990, recognizing the damage to the bay from years of neglect and abuse by the millions of annual visitors, the state’s first Marine Life Conservation District (MLCD). Over the years, Hanauma Bay’s popularity grew to unsustainable proportions. During peak periods in the late 1980’s, the nature preserve experienced as many as 10,000 visitors per day, which translated to three million visitors per year. Hanauma Bay’s natural resources were heavily impacted by overuse and a lack of knowledge by users regarding actions they could take to protect the bay.

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Community involvement has been instrumental in assisting the city government with understanding how management decisions impact the operations of Hanauma Bay, and ultimately the health of the coral reef ecosystem. The education program today consists of a team of highly trained UH Sea Grant staff and over 120 community volunteers who provide a top-notch educational experience at the bay. In 2011, volunteers contributed a total of 12,200 hours. The education program’s high quality volunteer support has been maintained by HBEP for over 20 years.

Today, Hanauma Bay serves as an example of how county government, community organizations, and academia can work together to form a successful, sustained partnership. Hanauma Bay is known worldwide as a highly successful model for the conservation of natural resources through education at a popular tourist destination. Government officials, managers, universities, and non-governmental organizations from around the world have visited Hanauma Bay over the years to learn about the integration of sustainable tourism with marine resource conservation so that they may apply this information to the management of their own natural resources.

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The education program began with a part-time educator and dedicated community volunteers. By the late 1990’s, they were sharing conservation messages on user etiquette through portable displays and an information desk located on the beach. However, the education team was able to reach only a fraction of the bay’s users.

In 2002, the City and County of Honolulu opened the bay’s state-of-the-art education center. The center features interactive touch screen learning tools, three-dimensional volcanic and geological displays, and historical displays to engage the visiting public and allow them to explore Hanauma Bay’s diverse natural resources.

With the new award-winning education center came the ability to educate 100 percent of the bay’s users by requiring each user to view an orientation video. The video discusses natural history, conservation, reef etiquette (e.g., don’t step on the corals), and ocean safety. It showcases the unique marine life found in the bay and the ways that each individual can reduce their environmental impact or “footprint.”

Prior to implementing the orientation video, park staff estimated approximately half of Hanauma Bay’s users stood or walked on the reef, not realizing that they were damaging corals and other living organisms. Since the implementation of the orientation video, reef trampling by bay users has been reduced to less than two percent. It is clear that increased knowledge and awareness has profoundly improved the health of Hanauma Bay’s nearshore environment.

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The Sustainable Coastal Tourism Fellowship Program is a signature project of the University of Hawai’i Sea Grant College Program (UH Sea Grant) Center for Sustainable Coastal Tourism. The purpose of this center is to marshal the resources of the University of Hawai’i to help support and promote a sustainable and economically productive tourism industry in Hawai’i; one that minimizes its environmental footprint, encourages stewardship of our precious coastal resources, and fosters respect for our indigenous people and our multicultural society.

The Sustainable Coastal Tourism Fellowship supports university faculty conducting scholarly activities on tourism for the betterment of Hawai’i’s coastal communities. The goal of the program is to expose fellows to the needs and issues of Hawai’i’s tourism industry in an effort to produce scholarship that addresses these challenges, and promotes sustainable and stewardship of our coastal and marine resources. The one-year fellowship launched with an evening reception to introduce the fellows to industry and government devoted to peace and disarmament, careful management of our lands and waters, and protection of the cultural diversity that has defined Hawai’i.

The inaugural fellowship is comprised of a cohort of four faculty fellows, one each from the schools of Travel Industry Management, Ocean and Earth Science and Technology, Hawaiian Knowledge, and the College of Social Sciences. Each fellow received a stipend of approximately $10,000 to support their research, half of which was sponsored by Ernest Nishizaki of Kyo-ya Hotels and Resorts with the remainder provided by UH Sea Grant.

Sustainable Coastal Tourism Fellows

Kimberly Burnett, PhD | College of Social Sciences
Kimberly Burnett is a Research Economist with the Economic Research Organization of the University of Hawai’i. Her primary research interests include environmental and natural resource economics, invasive species management, and watershed management, particularly for Hawai’i and the Pacific. Kimberly’s publications and extramural grants have focused on management of the invasive miconia tree in Hawai’i and Tahiti, optimal prevention and control of the brown tree snake, damage valuation for the noisy coqui frog, ecosystem service valuation, system approaches to terrestrial, water, and marine ecosystems, and zoning policies for the preservation of priority agricultural lands.

David M. Karl, PhD | School of Ocean and Earth Science and Technology
David Karl is the founder of the Center for Microbial Oceanography: Research and Education in the School of Ocean and Earth Science and Technology. He has focused his research on the ecological role of microorganisms in the oceans, ranging from the sunlit surface waters to the deep abyss. David is known for his groundbreaking efforts to promote collaborations among the previously separate disciplines of oceanography, microbiology, ecology, and genomics to better understand the sea, including its potential response to environmental variability and climate change. He was the co-leader of the Hawai’i Ocean Time-Series, one of the longest running and most successful biogeochemistry time-series studies ever conducted. He is a Moore Fellow and one of the leaders in the application of novel molecular approaches to understanding microbial biodiversity and ecosystem function. David has received numerous honors including membership in the National Academy of Science (2006), Fellow of the American Association of Microbiology (2006), a White House Presidential Young Investigator Award (1984), and the G.E. Hutchinson (1998), A.G. Huntsman (2001) and H.B. Bigelow (2004) medals for his scientific contributions. In 2010, David was selected as the lead coordinating author of a new chapter on ocean systems for the Intergovernmental Panel on Climate Change 5th Assessment Report, which will include emerging science related to ocean energy extraction. He is also leading a science-based examination identifying potential environmental effects of implementing a district-wide sea water air-conditioning system for Waikiki, with emphasis on microbial oceanography, biogeochemical cycling (e.g., CO₂ exchange), and ecology.

Jonathan Kamakawiwo’ole Osoiro, PhD | Hawai’inuiakoa School of Hawaiian Knowledge
Jonathan Osoiro has devoted his life to becoming an expert on Hawai’i’s politics and history, music and identity, and indigenous civil rights and social justice. A full professor at and former director of the Kamakako’o kanali Center for Hawaiian Studies, Jonathan has developed and taught classes in history, law as culture, music as historical texts, and indigenous research methodologies. He helped design the Master of Arts degree in Hawaiian studies and assisted in creating a new School of Hawaiian Knowledge.

Jonathan is a husband and father enthusiastically involved in family activities. A recipient of the 2010 Robert W. Clopton Award for Distinguished Community Service, his love for mankind and boundless energy for change is evident in his philosophies regarding peace, environmentalism, and the protection of Hawaiian culture. His visionary goal is that the Hawaiian sovereignty movement will ultimately produce a nation and government devoted to peace and disarmament, careful management of our lands and waters, and protection of the cultural diversity that has defined Hawai’i.

Daniel M. Spencer, PhD | School of Travel Industry Management
Daniel Spencer is an Associate Professor in the School of Travel Industry Management at the University of Hawai’i at Mānoa. Previously, he served as an Associate Professor of Tourism and Hospitality Management at Black Hills State University for four years. Prior to holding that position, he worked 17 years in tourism research and outreach—15 years with the Travel, Tourism, and Recreation Resource Center at Michigan State University and two years with the Center for Tourism Research at Black Hills State University. During this period he conducted a wide range of research and outreach projects and worked extensively with the tourism industry as a university-based consultant. Daniel’s expertise and interests are in the areas of tourism planning, policy, management, research, and outreach. He holds MS and PhD degrees in outdoor recreation and tourism planning and marketing from Michigan State University, with minors in geography at both levels. In 1995 he received a State Award of Meritorious Service from Epilon Sigma Phi, the national honorary fraternity of extension professionals, for “...significantly contributing to the orderly development of Michigan’s tourism industry by creating and disseminating information needed for sound investment, planning, and marketing decisions.”

Daniel M. Spencer | Kimberly Burnett, Denise E. Konan, Ernest Nishizaki, E. Gordon Grau, David M. Karl, Daniel M. Spencer at the fellows retreat, hosted by the UH Sea Grant Hanauma Bay Education Program.

Jonathan Kamakawiwo’ole Osoiro | Kimberly Burnett, Denise E. Konan, E. Gordon Grau, David M. Karl, Daniel M. Spencer at the fellows retreat, hosted by the UH Sea Grant Hanauma Bay Education Program.

David M. Karl | Kimberly Burnett, E. Gordon Grau, David M. Karl, Daniel M. Spencer at the fellows retreat, hosted by the UH Sea Grant Hanauma Bay Education Program.

Danielle M. Spencer, Kimberly Burnett, Denise E. Konan, Ernest Nishizaki, David M. Karl at the inaugural fellowship program kick-off reception hosted by Kyo-ya Hotels and Resorts.
Shaping Tourism to a Changing Climate: Can Hawai‘i Become a Model of Sustainability?

By Luisa Cristini, PhD, UH Sea Grant Postdoctoral Research Fellow

Hawai‘i is potentially facing future rapid change to its natural systems, economy, and society. Climate change impacts to natural and built systems, as well as natural resource limits and population pressures, pose challenges to both the environment and the society. Communities across the state will need to adapt to these changes. Likewise, all industries need to plan for a more sustainable future, and tourism, Hawai‘i’s largest economic sector, is no exception.

As in many regions of the world, tourism in Hawai‘i is an integral part of the community with close links to other economic sectors and is a primary source of employment. Therefore, Hawai‘i needs to plan for a sustainable future in order to thrive. Visionary thinking on innovative ways to adapt is needed so that opportunities for sustainable development can make Hawai‘i a model for the international tourism sector.

Achieving a sustainable tourism industry in Hawai‘i means improving economic resilience while simultaneously decreasing the environmental impact of the sector in general. Great improvements in efficiency and sustainability are being made in the energy and transportation sectors, hazard mitigation, disaster recovery, and ecosystem conservation and restoration. Showcasing Hawai‘i as a leader in comprehensive sustainable tourism will create more stable niche markets and help sustain the local economy during economic downturns.

The University of Hawai‘i Sea Grant College Program (UH Sea Grant) Center for Sustainable Coastal Tourism (CSCT) supports programs and information that address coastal tourism issues. One of the key projects of the CSCT focuses on understanding the impacts of climate change to Hawai‘i’s tourism sector and exploring strategies for adaptation. The project is funded by the Hawai‘i Tourism Authority and includes a research component along with an outreach and education effort.

The research, led by Dr. Denise Konan, Dean of the College of Social Sciences and Director of the CSCT, in collaboration with Dr. Linda Cox, Community Economic Development Specialist at the Department of Natural Resources and Environmental Management, and Dr. Luisa Cristini, Research Fellow at UH Sea Grant, used an analytical approach to collect and review the published literature and data on the climate-related processes impacting Hawai‘i’s environment as well as on the economic value of the resources at risk. Priority sectors for adaptation and the most vulnerable areas were also identified.

The research showed that the processes triggered by the increase in global atmospheric greenhouse gases concentration on Hawai‘i’s environment potentially include:

- increase in air, land, and sea surface temperature
- acidification of the ocean
- rise in the sea level, changes in rainfall and stream flow patterns and variability
- increase in drought frequency and duration
- change in storm frequency and intensity
- decrease in trade winds

All these processes have multiple impacts on both ecosystem and human dimensions that directly and indirectly affect tourism. Priority adaptation sectors identified through the analysis include: public health; tourism-related businesses (e.g., accommodation, restaurants, retail); transportation assets (airports, harbors, roads); recreational activities (both marine-, land- and freshwater-based); and facilities (e.g., golf courses, beaches, parks).

Tourism resources and assets jeopardized by climate change are found in all of the main Hawaiian Islands, making adaptation an issue for the entire state. The available data on the market prices for some of the natural resources in danger (e.g., watersheds, coral reefs, and beaches) has been reviewed. An analysis indicated that Hawai‘i’s natural resources, tourism infrastructure and facilities, and tourism-related businesses “used” by visitors coming for vacation in 2010 had a market value of $2.245 million dollars. Given the great importance of tourism to Hawai‘i’s economy, adaptation strategies are being explored to mitigate the impact of climate change. Some of these strategies include: sustainable use of energy and water; proactive public health care, natural resources conservation and outdoor recreation regulation; identification of vulnerable coastal facilities and critical infrastructure; and gauging and assessing visitor competition with other tropical destinations. These strategies have the potential to provide Hawai‘i’s tourism sector with environmental, economic, and educational benefits.

This work contributes to the understanding of climate change impacts for Hawai‘i and its economy, and constitutes the first analysis of the climate related vulnerability of tourism resources and their economic value. Further research on climate and economics can be developed from this fundamental investigation and allow for deeper comprehension of the implications of a changing climate on Hawai‘i’s tourism.

The outreach component of the project, led by Dolan Eversole and Matthew Gonser, extension agents at UH Sea Grant, in collaboration with Dr. Cristini, aims to disseminate the results of the research and to assess the tourism stakeholders’ understanding of preparedness to climate change-related risks and adaptation, as well as their needs and priorities in terms of research and policy. A series of five outreach workshops was held on the four main Hawaiian Islands (O‘ahu, Hawai‘i, Maui, and Kaua‘i) that engaged community representatives, tourism entrepreneurs, and individuals, fostering collaboration between institutions and tourism enterprises.
As a University of Hawai‘i Sea Grant College Program (UH Sea Grant) supported graduate student within the UH School of Architecture, Trenton Lum first began work on design concepts for the UH Kapi‘olani Community College Culinary Institute of the Pacific (CIP) at Diamond Head as his dissertation project. Working closely with the UH Sea Grant Center for Smart Building and Community Design, he recognized the unique opportunity to help shape the vision of an area with special importance to many Hawai‘i residents and visitors alike. Lum also realized the challenge and responsibility of establishing such a prestigious culinary program in Hawai‘i that would ultimately have a significant impact on the state and its tourism industry.

Lum began his research by studying the physical location and environmental factors of the project site and by attending numerous community meetings to understand first-hand how the community felt about the planned facility. The CIP would be located on the northern slopes of Diamond Head at the site of the former Cannon Club, remembered by Hawai‘i residents and visitors as a cherished local gathering place. Ideally, CIP would perpetuate this spirit while serving as a model of sustainability, offering educational opportunities for visitors and students and training for local restaurant and hospitality industries.

Numerous discussions and input from community groups, neighborhood boards, the Department of Land and Natural Resources, Kapi‘olani Community College administrators, and Hawaiian cultural groups guided Lum in creating a proposed design concept that included a multitude of “green” technologies such as green roofs, onsite wastewater treatment, photovoltaics, and solar absorption cooling strategies. Since culinary institutes are by their very nature large consumers of energy, he also focused on the use of Energy Star equipment and other energy saving strategies.

After Lum completed his dissertation and relocated to California, the architecture firm Ferraro Choi and Associates, which specializes in sustainable building design, was selected to move the project to fruition. Currently, Kapi‘olani Community College is working with Ferraro Choi and Associates on the first phase of development which is anticipated to begin in 2013. With extensive input from the community, the architectural plans have evolved into a site that models the ancient Hawaiian concept of land division called the ahupua‘a where there are multiple centers of activity and gathering spaces. The ahupua‘a emphasizes the interrelationship of natural elements and beings, so the planned site will maximize the use of the open spaces to create a learning environment where the outdoor areas enhance and build on the knowledge and skills gained in the classroom.

The entire CIP site is approximately 7.2 acres. The buildings will cover 40,000 square feet and in addition to the planned gathering spaces, much of the site will be left open for gardens to propagate Hawaiian medicinal plants and other plants that will be incorporated into the growing systems. The buildings will cover 40,000 square feet and in addition to the planned gathering spaces, much of the site will be left open for gardens to propagate Hawaiian medicinal plants and other plants that will be incorporated into the growing systems. The first phase of construction will include the classroom building and its support buildings as well as four laboratories – 1) multi-function, 2) Asia Pacific, 3) baking, and 4) pastry. The other areas of the campus will include administration buildings, a restaurant, an amphitheater, and cultural gardens.

The site is intended to be a gathering place for visitors, the surrounding community, and students enrolled in the culinary program. To make the new facility as open and convenient to the public as possible, the architectural design team moved the entrance closer to the road where it will be highly traversed by runners and walkers, encouraging the community to visit the restaurant and grounds. The dining facilities will also be open more days of the year and more hours of the day than the current Kapi‘olani Community College facility.

With a design incorporating state-of-the-art sustainable design strategies, the CIP is poised to become a world-class institute where students, visitors, and community members gather to learn about culture, stewardship, sustainability, and resource responsibility. Through traditional classroom instruction and from the very design of the campus, students will embody these principles long after they graduate and enter the workforce.
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