

# University of Hawai'i Sustainability & Resilience Institute

## Landscape Assessment



UNIVERSITY OF HAWAI'I AT MĀNOA

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# University of Hawai'i Landscape Assessment for the Institute of Sustainability and Resilience

## **Introduction**

As the premier U.S. research and academic institution in the Pacific, the University of Hawai'i is uniquely positioned to meet the needs of a Sustainability and Resilience initiative. From its location and rich cultural ties to the Asia-Pacific region, to its research programs, infrastructure, years of regional collaborations, and administrative capacity, the university's myriad assets can be harnessed to support and realize the goals of the initiative. The university and its partners have demonstrated this capability through their oversight of, and contributions to well-established programs, relationships, and collaborations that address the broad areas covered under Sustainability and Resilience.

The University of Hawai'i's record of excellence in research, academic programs, and outreach enterprises, including years of exemplary regional collaborations, makes it well-equipped to inspire and support ISR synergistic activities. As a premier research university, the University of Hawai'i at Mānoa (UHM) is among the top 50 public universities in the U.S. in terms of federal extramural funding, largely due to its unique status as a Land Grant, Sea Grant, and Space Grant University.

The over-arching purpose of the ISR is to evolve the UH-Mānoa campus into a global hub for island sustainability and resilience. Wherever possible, we refer to sustainability and resilience "*in all its dimensions: cultural, economic, environmental, and social.*"

This landscape assessment has been created to simply summarize the various entities, personnel, and academic programs the university can utilize to facilitate the establishment and implementation of the ISR.

In order to better understand the resources that the University of Hawai'i can bring together to support the ISRI initiative, we here describe the relevant programs and curricula that presently exist at the University.

## **I. Research Programs and Activities**

### ***College of Social Sciences, UH-Mānoa Asia Pacific Initiative (API)-Resilience***

The Asia Pacific Initiative (API) is a consortium of academic institutions throughout the Asia Pacific Region. Members include: U.S. (University of Hawai'i); Japan (United Nations University, Waseda University, Keio University, University of the Ryukyus); Thailand (Asian Institute of Technology); Bangladesh (Bangladesh University of Engineering and Technology); Indonesia (Gadjah Mada University); India (TERI University); Samoa (National University of Samoa) and Fiji (University of the South Pacific). The API partnering institutions develop and deliver joint courses with a focus on sustainability, disaster management and humanitarian assistance, ICT and infrastructure for community development. Course participants receive credit through

their hosting institution. The Telecommunications and Social Informatics Research Program (TASI) of the Social Science Research Institute (SSRI) serves as the Secretariat of the API.

***Capacity Building for Community Resilience: Sustainable Ecosystem and Disaster Resilience at the Village Level, American Samoa-Resilience***

With a focus on American Samoa, this program explores existing practices and assists in the development of community planning practices that promote community resilience within a sustainable ecosystem framework. The extensive damage wrought by the September 2009 tsunami on the many communities and the environment in American Samoa highlighted the need to develop planning tools at the local level. The project has developed and adapted planning tools and community resilience training programs for American Samoa Communities and is designed to work at multiple levels to assess and develop planning capacities and promote collaboration between communities, government agencies, and planners.

***Hawai'i Coral Reef Initiative (HCRI)-Resilience***

The goal of HCRI is to increase understanding of Hawai'i's valuable, yet vulnerable, near-shore reef ecosystem. The HCRI program in the Social Science Research Institute supports scientific research and monitoring in order to advance effective resource management within the state, public awareness efforts, briefings for legislators and decision-makers, and internships and fellowships. HCRI is jointly managed by Hawai'i's Department of Land and Natural Resources, Division of Aquatic Resources and UH.

***Hazards, Climate, & Environment Program (HCEP)-Resilience***

The HCEP in the Social Science Research Institute works with local and regional stakeholders and experts in physical and biological science, engineering, and social-cultural knowledge to assess risk and vulnerability from hazards, climate and environmental degradation, and to develop risk reduction methods to build resilient communities. Current projects include assessing socioeconomic impacts of drought and hazards on communities in Hawai'i, developing an approach for managing cultural resources at risk from climate change with the US National Park Service, and examining hazard mitigation and disaster risk reduction vulnerabilities and capacities within the USAPI. HCEP developed the Hawai'i State Hazard Mitigation Plans to ensure recovery funding for Hawai'i should disaster occur.

***National Disaster Preparedness Training Center (NDPTC)-Resilience***

The NDPTC is a member of the National Domestic Preparedness Consortium (NDPC) and is authorized to develop and deliver training and educational programs related to homeland security and disaster management, with a specific focus on natural hazards, coastal communities, and the special needs and opportunities of islands and territories. The NDPTC is actively engaged with FEMA and UH, as well as with other partners across the region to integrate the delivery of its trainings, products, and services. Uniquely positioned geographically and culturally, the NDPTC works collaboratively to develop and deliver training and education in the areas of disaster preparedness,

response, and recovery to governmental, private, tribal, and non-profit entities, and under-represented/under-served communities. It incorporates urban planning and environmental management, emphasizing community preparedness and addressing the needs of vulnerable at-risk populations.

### ***Telecommunications and Social Informatics (TASI) Research Program-Resilience***

The TASI Research Program in the Social Science Research Institute (SSRI) focuses on social uses, policies, and applications of information and communication technology (ICT) and has long-standing institutional relationships in Asia and the Pacific Islands region. The program provides technical expertise and ICT network connectivity, enabling regional cooperation among disaster/risk management and recovery agencies, government organizations, and academic institutions. TASI serves as the Secretariat of the Asia-Pacific Initiative that provides the organizational framework and support for linkages among academic institutions in Japan, Thailand, India, Indonesia, Fiji, and Samoa with curricula focused on disaster management and humanitarian assistance. TASI is a partner of the National Disaster Preparedness Training Center and serves on the National Domestic Preparedness Consortium Training Technology Sub-Committee and the Pacific Risk Management 'Ohana (PRiMO) Communication Hui.

### ***The Economic Research Organization at the University of Hawai'i (UHERO)-Sustainability and Resilience***

UHERO conducts rigorous, independent economic research on issues that are both central to Hawai'i and globally relevant. Analysis is distributed widely to promote research-driven dialogue and inform public- and private-sector decision making in Hawai'i.

### ***Department of Anthropology-Sustainability and Resilience***

The Department of Anthropology's programs encourage and develop fundamental skills such as critical thinking, communication, self-direction, expression, creativity, global awareness and team dynamics. Specialties include; Applied Archaeology (trains the next generation of professional non-academic archaeologists to be effective advocates for the study and preservation of historic sites), Applied Cultural Anthropology (trains students in the theories, methods, and analysis of cultural anthropology that can be utilized in careers requiring community-based fieldwork approaches to research), Ecological Anthropology (focuses on human-environment interactions using approaches across the subfields of anthropology), and Medical Anthropology (studies the sociocultural dimensions of health and illness).

### ***Department of Economics-Sustainability and Resilience***

The Department of Economics offers an undergraduate curriculum featuring student mentoring, free introductory course tutoring, a student-run club, internships, co-op work arrangements, study abroad programs, an Honors program, and research opportunities with faculty. Specialties include; Resource and Environmental Economics (addresses sustainability, climate change, ocean resources, and energy policies), International Economics (studies foreign investment, international monetary systems, trade policy, and immigration), Human Resources (analyses demographic issues, labor

markets, and health economics), Public Economics and Economic History (studies how public policies and institutions affect behavior and welfare in historical and contemporary contexts), Development Economics (considers institutions, efficiency, and growth in developing countries), and Experimental Economics and Game Theory (deal with the models of strategic interactions and testing their predictions in the laboratory).

### ***Department of Geography-Sustainability and Resilience***

At its core, Geography is about the human relationship with the environment, and its studies lend understanding to many critical issues that face modern society. The discipline spans natural science, social science, and the humanities, as well as technology, as it engages in questions such as environmental processes, socio-political dynamics, cultural change, and the use of modern geo-spatial technologies. Specialties include; Environmental Geography (engages in a systematic study of the Earth's physical environment, natural resource management and global environmental change. Its focus is on global change and its impact on different parts of the world in the terrestrial and marine environments), Human Geography (investigates the cultural, economic, and political processes that shape human activities on the Earth. It focuses on issues related to globalization, cultural and political changes and its relationship to the environment), and Geographic Technology (includes the study of cartography, geographic information systems (GIS), remote sensing, and the use of these technologies in understanding spatial environmental issues. This is a fast-growing area in geography with many research and job opportunities).

### ***Department of Political Science-Sustainability and Resilience***

Students in the Department of Political Science investigate a broad range of topics, from political theory to indigenous politics. Students are encouraged to broaden their perspectives by taking courses in other departments and through the many interdisciplinary programs associated with the UH Mānoa, such as Asian Studies and the Center for Pacific Islands Studies. Specialties include; The Hawai'i Research Center for Futures Studies (offers undergraduate and graduate students the opportunity to reconceptualize and invent the future), and Indigenous Politics (facilitates inquiry on a variety of issues including histories of interaction between Indigenous and settler peoples).

### ***Department of Sociology-Sustainability and Resilience***

The Department of Sociology prepares the finest young scholars in Hawai'i and the Asia-Pacific region to succeed as academics, researchers, service providers, or as leaders and good citizens in their own societies. The department uses its natural resources of location, people, and relationships, to generate new knowledge about life on an island that is located in the middle of the Pacific and host to a true multi-ethnic mix of peoples. With a view of the world that is both local and global, the department provides students with a broad foundation in theory and methods of sociological research. It also focuses on the following four areas in which it offers exceptional expertise and opportunities for research and training; Sociology of Asia and the Pacific, with emphasis on comparative sociology of Asia, Crime, law, and deviance, Ethnic and

race relations, and Health, aging, and medical sociology.

***Department of Public Administration-Sustainability and Resilience***

The University of Hawai'i at Mānoa, College of Social Sciences Public Policy Center ("PPC") brings together expertise, commitment, and a strong desire to enhance the quality of community life through teaching, research, civic engagement and interdisciplinary work towards the development and analysis of good public policies. Specialties include; Public Policy (emphasizes the analyses, design and evaluation of policy choices to solve public problems), Conflict Resolution (facilitation, mediation and negotiation) (focuses on workplace interactions, and interpersonal and community relations in a global society), Peace Studies (broadens students' perspectives and strengthens critical thinking on issues of war, justice, and governance), and Energy Policy. The Policy Center facilitates Hawai'i's Energy Policy Forum and conducts research for energy planning and policy.

***Department of Urban and Regional Planning-Sustainability and Resilience***

The Department of Urban and Regional Planning is an academic discipline that fosters a multidisciplinary set of intellectual and practical tools to help us chart our future in an age of uncertainty. The department strives to improve the quality of life for present and future generations, both locally and globally, through planning, public policy and social collaboration. Major academic areas include; Community Planning, Environmental Planning, Asia/Pacific Urban and Regional Planning, Land Use/Infrastructure Planning, Conflict Resolution, Social Policy, Citizen Participation, Disaster Management, Coastal Resources, Energy, and Climate Change Planning.

***Department of Women's Studies-Sustainability and Resilience***

The Department of Women's Studies at the University of Hawai'i at Mānoa (UHM) is proud to offer an interdisciplinary approach to the study of women and gender issues. The department emphasizes multicultural and global education, and innovative feminist research on issues of gender, sexuality, ethnic and national diversity and social justice with a focus on women in Hawai'i, Asia, and the Pacific.

***School of Ocean and Earth Science and Technology (SOEST), UH-Mānoa International Pacific Research Center-Resilience***

This is an international climate research center, with a focus on the Asia-Pacific region. The Center seeks to understand the climate system and how it may respond to human activity by conducting experiments with computer simulation models and by analyzing the many direct and remote observations related to climate. Their mission is to provide an international research environment dedicated to improving understanding of the nature and predictability of climate variations and change in the Asia-Pacific region, and to developing innovative ways to utilize the knowledge gained for the benefit of society.

***University of Hawai'i Sea Level Center (UHSLC)-Resilience***

The UHSLC collects, processes, analyzes, and distributes tide gauge data from around the world in support of climate and oceanographic research. UHSLC data analysts

review and archive tide gauge observations from nearly 500 stations and 70 international agencies and UHSLC technical staff help to maintain nearly 80 stations worldwide. UHSLC real-time data contribute to the Pacific Tsunami Warning Center and other operational warning agencies.

### ***University of Hawai'i (UH) Sea Grant College Program-Resilience***

The UH Sea Grant College Program is part of a national network of 32 programs that promote better understanding, conservation, and use of coastal resources. Situated in SOEST, UH Sea Grant works in partnership with NOAA to identify Hawai'i's critical resource management issues and guide cutting-edge scientific research to address these challenges.

#### ***- Coastal and Climate Science and Resilience***

Hawai'i and the Pacific Islands are highly vulnerable to coastal hazards including impacts related to climate change and sea-level rise (SLR). As SLR accelerates and climate and ocean conditions change, it is becoming increasingly important for island communities to develop policies and implement strategies that reduce vulnerability and increase resilience to natural hazards. Development, infrastructure, and populations in Hawai'i and the Pacific Islands are generally concentrated on low-lying coastal plains making communities and local economies highly vulnerable to flooding, coastal erosion, SLR, particularly with coastal disaster events including tropical cyclones and tsunamis.

#### ***- Center for Water Resource Sustainability***

The CWRS conducts research on water resource-related issues in Hawai'i and the US-affiliated Pacific Islands and serves to facilitate access to interdisciplinary expertise within the university to enhance understanding of water issues.

#### ***- Smart Building and Community Design***

Increasing coastal development and urbanization pose the greatest risk to the sustainable use and wise stewardship of our coastal, marine and great lakes resource. Development impacts are eroding achievements in water quality, ecosystem and habitat management, coastal hazard mitigation and other Sea Grant priority areas of concern. Sea Grant's adaptive, regional extension, research and education structure is uniquely suited to address coastal development and community design at the local level.

#### ***-The Center for Sustainable Coastal Tourism***

The Center for Sustainable Coastal Tourism was established in 2009 as a university collaboration between the School of Ocean and Earth Sciences and Technology, the College of Social Sciences, School of Travel Industry Management, Hawai'i inuiakea School of Hawaiian Knowledge, and the School of Architecture. In partnership with local businesses, government, and the community, the center conducts research, education, and outreach on Hawai'i tourism and the various economic, cultural and environmental impacts of the visitor industry. Signature projects of the Center of Excellence for Sustainable Coastal Tourism serve to improve the quality of Hawai'i's environment, restore habitats and ecosystems, and reduce the energy and water needed to support

the tourism industry resulting in positive impacts on both Hawai'i's economy and quality of life for local residents.

*-Coastal Storms Program (CSP)*

The Coastal Storms Program is a nationwide effort led by the NOAA Coastal Services Center to make Pacific Island communities safer and more resilient to hazards. This work is accomplished by bringing together organizations from all sectors and fostering partnerships for community collaboration to: Reduce the impact of coastal hazards to Pacific Island communities, ecosystems and economies; Improve the regional capacity to identify, plan, and respond to natural hazards; Develop better communication, awareness, and understanding of coastal hazards; and Foster community resilience through outreach, education and CSP product development. Current research projects being supported through CSP include:

- Risk and Vulnerability Assessment of Sea Level Impacts in Hawai'i
- Pacific Islands Emergency Communications Enhancements
- Climate Adaptation Law and Policy Study
- Sea Level Rise and Coastal Flood Impact Mapping for Hawai'i, Guam, CNMI, and American Samoa

Adaptive Planning for Sea-Level Rise in Maui and Hawai'i Counties  
(<http://seagrant.soest.hawaii.edu/csp>)

*-Other current UH Sea Grant programs and research*

- Three-dimensional Model of Tsunami Generation and Near-field Characteristics
- Mapping Erosion Hazards on O'ahu and Kaua'i
- Understanding Attitudes, Beliefs and Preparedness for Climate Change Impacts and Other Coastal Hazards in Hawai'i

***The Hawai'i Natural Energy Institute-Sustainability and Resilience***

HNEI performs research, conducts testing and evaluation, and manages public-private partnerships across a broad range of renewable and enabling technologies to reduce the State of Hawai'i's dependence on fossil fuel. It is an organized research unit of the School of Ocean and Earth Science and Technology (SOEST) of the University of Hawai'i at Mānoa. Programs focus on; Alternative Fuels, Grid Integration, Fuel Cell and Battery Technology, Renewable Power Generation, and Energy Efficiency and Transportation. HNEI is committed to supporting the State, Federal agencies and industry in planning and implementing clean energy initiatives. HNEI's activities can be grouped into five core functions; HNEI Activities Research & Development, Technical Validation & Implementation, Analysis & Modeling, Education & Training, and State Energy & Policy Support. HNEI also houses the Hawai'i National Marine Renewable Energy Center (HINMREC). HINMREC is to facilitate the development of commercial wave energy systems. HINMREC assisted the US Navy in the implementation of a grid-connected wave energy test site (WETS) at Marine Corps Base Hawai'i in Kaneohe. WETS provides multiple-berthing for prototype wave energy conversion (WEC) devices in the 10 to 1000 kW range in water depths of 30 m, 60 m and 80 m allowing developers to prove their devices and generate the necessary data to advance their designs toward commercial



readiness.

***Department of Geology and Geophysics-Sustainability and Resilience***

The department offers a wide range of active, extramurally-funded, research and study programs at the graduate and undergraduate levels. The department has a reputation for high quality faculty, research facilities, and opportunities in the Earth, Ocean, and Space sciences. Within the department, general areas of research are divided between three broad divisions; Geophysics and Tectonics (G&T), Marine and Environmental Geology (MEG), Volcanology, Geochemistry, and Petrology (VGP). Our geographic location in the midst of the Pacific Ocean and the rich geologic setting of Hawai'i provide a natural focus for research programs in; Composition and dynamics of Earth's deep interior, Formation, motion and recycling of Earth's crust (the rock cycle), Earth's surface: water, sediments, and life, Earth history, Earth hazards, resources and sustainability, and The Solar System.

***Department of Oceanography-Sustainability and Resilience***

Inclusive of Cooperating and Affiliate members, more than 70 Graduate Faculty teach and advise graduate students in the Oceanography field of study. The collective research expertise and programs of these faculty provide a broad diversity of potential projects and employment opportunities for students. Department faculty are loosely organized into three Divisions — Physical Oceanography, Marine Geology and Geochemistry (MGGD), and Biological Oceanography.

***Department of Ocean and Resources Engineering-Sustainability and Resilience***

The mission of the Department of Ocean and Resources Engineering (ORE) is to provide high quality education, research and service to its constituents. Major Goals of the Department are to; Educate top quality ocean and resource engineers to meet the needs of Hawai'i, the nation and the engineering profession, Conduct and disseminate research in the field of Ocean and Resources Engineering, and Provide service to the State of Hawai'i, Pacific Basin and engineering profession through such opportunities as seminars, conferences, consulting, work with government agencies and professional societies.

***College of Tropical Agriculture and Human Resources, UH-Mānoa***

***Department of Natural Resources and Environmental Management (NREM)- Sustainability and Resilience***

The NREM department emphasizes the science and management of natural resources and their links to environmental quality. Grounded in scientific knowledge of the physical, chemical, biological, economic, social, and policy elements of natural resources management, the department is devoted to principles that underpin productive, sustainable land use and enhanced environmental quality in order to address contemporary resource use problems and assist in sound decision making for optimizing land use and managing agricultural and forestry systems, watersheds, and landscapes in an ecologically sound manner. With an emphasis on scientific objectivity, the NREM curriculum aims to provide the tools needed to respond to resource policy issues and the needs of diverse clientele and communities including policy makers and

planners.

### ***Department of Tropical Plant and Soil Sciences-Sustainability and Resilience***

The academic curriculum of UH Mānoa's Department of Tropical Plant and Soil Sciences (TPSS) encourages a broad understanding of how plants interact with the physical, chemical, and biological environment at the molecular, tissue, whole-plant, and population levels. Coursework in enterprise management with an emphasis on analytical decision-making provides valuable skills for students seeking a career in business. Research encompasses the use of observation and measurement to discover new knowledge, refine or refute existing knowledge, and develop technological innovations. Extension brings this knowledge and innovation to members of the public through community education and outreach. The research and extension activities carried out by faculty members, students, and staff in UH Mānoa's Department of Tropical Plant and Soil Sciences (TPSS) are two components of our mission as part of Hawai'i's land-grant college and university. (The third component is academic instruction).

### ***Department of Plant and Environmental Protection Sciences-Sustainability and Resilience***

The Department of Plant and Environmental Protection Sciences, or PEPS, brings together experts in several fields, such as plant pathology, entomology, weed science, and integrated pest management who use innovative research and cutting-edge tools to preserve food security and environmental functioning. Our Mission is to provide excellence in research, education and service for the biology, ecology and management of pests in agriculture, natural and human-built environments in Hawai'i, the Pacific and the tropics.

### ***Department of Human Nutrition, Food and Animal Sciences-Sustainability and Resilience***

The Department of Human Nutrition, Food and Animal Sciences enhances nutrition and health by educating people and developing and disseminating science-based information to promote sustainable food production and animal systems appropriate for the Pacific Region. Objectives include; Ensure sustainable and profitable agricultural and food production systems, enhance research and instruction through the fundamental understanding of animal/human physiology, Foster an integrated and interdisciplinary approach to learning that prepares students to be effective and productive citizens and life-long learners in a global society, have a safe and secure food system, and have a healthy well-nourished population in the Pacific Region.

### ***Sustainable and Organic Agriculture Program-CTAHR EXTENSION-Sustainability and Resilience***

Across Hawai'i, farmers and ranchers are experimenting with different ways of producing agricultural products, novel approaches which aspire to bring social, economic and environmental well-being to both farm families and to the rural communities in which they live.

### ***Shidler College of Business, UH-Mānoa***

### ***Finance-Sustainability and Resilience***

The major in Finance is designed to develop analytical skills in the planning, management and control of financial resources to achieve the financial goals of an organization. Central to this task is evaluation of the risk and return consequences in financial decisions (including the selection of assets, equipment, buildings, inventories, securities, etc.) and the choice of financing alternatives (selling stock, borrowing from a bank, issuing bonds, etc.).

### ***School of Travel Industry Management, UH-Mānoa Center for Tourism Policy Studies-Sustainability and Resilience***

In today's dynamic travel and tourism industry, private-sector companies, governments, and development agencies require timely information and research as well as educational programs to update their knowledge and skills. The Center for Tourism Policy Studies (CTPS) conducts research for academic, government, and industry use, offers professional development and continuing education programs, and provides technical assistance and other community services in tourism-related areas. With its comparative advantage of experience and expertise, the CTPS provides resolutions to tourism challenges and opportunities in Hawai'i and countries in the Asia-Pacific region. The School is uniquely situated to meet the needs of the public and private sectors and a large variety of stakeholders involved in ensuring sustainable/responsible tourism.

### ***College of Engineering, UH-Mānoa***

#### ***Department of Civil and Environmental Engineering-Sustainability and Resilience***

Civil and Environmental Engineering (CEE) focuses on the activities of people and their interaction with the environment. The civil engineer conceives, plans, designs, constructs, operates, and maintains buildings, bridges, highways, airports, railways, tunnels, waterways ports and harbors, dams, water supply and wastewater treatment systems, and earthworks. Important considerations of the civil engineer in providing infrastructure and buildings is improved health and safety for people, minimized impact to the environment, sensitivity to costs and resources, and overall sustainability. Civil engineering continuously improves its methods and each new or upgraded component improves the standard of living for large populations. The cities we live in and most of their vital infrastructure are the creation of civil engineers.

### ***REDLAB-Sustainability and Resilience***

The Renewable Energy Design Laboratory at the University of Hawai'i at Mānoa is within the College of Engineering. Our research focuses on sustainable energy production (wave, wind, PV), energy efficiency in transportation (Hybrid, PHEV and EV), large-scale energy management (smart grid, complex system optimization), design morphology, energy policy, new technology adaptation and education. Our research falls mostly within the spheres of three University-wide centers: The Renewable Energy and Island Sustainable Centre, Hawai'i National Marine Renewable Energy Center, and the Hawai'i Natural Energy Institute. Major sponsors of our activities are The US Department of Energy, National Science Foundation, Utilities and Private sector.

### ***Hawaiʻinuiākea-School of Hawaiian Knowledge***

Hawaiʻinuiākea is Kamakakūokalani Center for Hawaiian Studies, Kawaihuelani Center for Hawaiian Language, Ka Papa Loʻi O Kānewai Cultural Garden, and Native Hawaiian Student Services. Established in 2007, Hawaiʻinuiākea is the newest college on the Mānoa campus and the only indigenous college in a Research I ranked institution. The mission of the Hawaiʻinuiākea School of Hawaiʻian Knowledge is to pursue, perpetuate, research, and revitalize all areas and forms of Hawaiian knowledge.

### ***College of Natural Sciences, UH-Mānoa Department of Biology-Sustainability and Resilience***

The Department of Biology was first established in 1966, but has recently transitioned to becoming an official department within the College of Natural Sciences. The Department is a cooperative effort with the departments and programs that concern themselves with the basic biological sciences. All of the instructors are either from our Department, researchers and leaders of labs and programs outside of the University of Hawaiʻi system, or members of one of the following departments: Cellular and Molecular Biology, Molecular Biosciences and Bioengineering, Plant and Environmental Protection Sciences, or Women's Studies.

### ***School of Nursing and Dental Hygiene, UH-Mānoa Nursing-Resilience***

The University of Hawaiʻi at Mānoa School of Nursing & Dental Hygiene (SONDH) is the premier nursing and dental hygiene school in the State of Hawaiʻi. Located on the Mānoa campus, the only doctoral/research university-intensive institution in Hawaiʻi, the School is dedicated to improving health through education, research, and service. The School provides instructional, clinical and research activities to enhance the health and care of diverse populations in the State of Hawaiʻi and the Asia-Pacific region.

### **John A Burns School of Medicine, UH-Mānoa *Department of Native Hawaiian Health (DNHH) The Center for Native and Pacific Health Disparities Research (CNPHDR)- Resilience***

The Community Engagement Core works with organizations in Hawaiʻi and the Continental U.S. on ways to improve cardiometabolic health of Native Hawaiians and other Pacific Peoples. Many of the Core's activities are driven from the priorities identified by the Ulu Network. Formed in 2004, the Network is an extensive 30-member community coalition, with nearly 70 sites sweeping across Hawaiʻi and reaching into California. The membership includes all 14 federally qualified community health centers (CHC) in Hawaiʻi, all five federally established Native Hawaiian Health Care Systems (NHHCS), two partners in California, and several rural community hospitals, non-profit organizations, educational institutions and grass-roots organizations that serve Native Hawaiians and other Pacific Peoples.

### **William S Richardson School of Law, UH-Mānoa *Environmental Law Program-Sustainability and Resilience***

Recognizing the challenges that Hawaiʻi faces in maintaining an environmentally

sustainable economy, the School of Law has developed a vibrant and diverse Environmental Law Program (ELP). Since its inception in 1988, the ELP has been a leading specialty program at the School of Law, and we are ranked among the top 25 schools in the nation for studying environmental law. In training future environmental lawyers, the ELP contributes to the advancement of environmental law doctrine, scholarship, and practice locally, regionally, nationally, and internationally.

### **College of Education. UH-Mānoa**

#### ***Curriculum Research & Development Group (CRDG)-Sustainability and Resilience***

CRDG is an organized research unit in the College of Education at the University of Hawai'i Mānoa that contributes to the body of professional knowledge and practice in teaching and learning, curriculum development, program dissemination and implementation, evaluation and assessment, and school improvement. CRDG conducts research and creates, evaluates, disseminates, and supports educational programs that serve students, teachers, parents, and other educators in grades PreK–20. CRDG programs focus on our unique place in the world. Programs in social studies, humanities, the arts, and STEM reflect the cultural and environmental influences of Hawai'i, Asia, and the Pacific. A particular emphasis is on providing access and support for Native Hawaiian learners.

### **Office of Undergraduate Education. UH-Mānoa**

#### ***Interdisciplinary Studies-Sustainability and Resilience***

The Interdisciplinary Studies Program enables interested and qualified students to arrange interdisciplinary “major equivalents” for B.A. degrees. This is one avenue for a student to undertake study in the multi-disciplinary domains of sustainability and resilience.

### **Office of Public Health Studies. UH-Mānoa-Resilience**

The Office of Public Health Studies (OPHS) offers specializations in epidemiology, health policy and management, Native Hawaiian and Indigenous health, and social and behavioral health sciences.

### **Water Resources Research Center. UH-Mānoa-Sustainability and Resilience**

The Water Resources Research Center (WRRC) serves the state of Hawai'i, other Pacific islands, and the world by researching the unique water-related issues distinctive to island and other remote environments. The center is linked to the National Institutes for Water Resources, a network that is represented in every state as well as Washington, D.C. and three U.S. territories. The goals of the center include coordinating and conducting research to identify, characterize, and quantify water-related problems in the state of Hawai'i, assisting Pacific Island and Asian governments facing water problems similar to those in Hawai'i, and facilitating access to interdisciplinary expertise within the university to enhance understanding of environmental problems and identify effective solutions. WRRC's facilities include well-equipped analytical laboratories for environmental virology, water bacteriology, water quality, soil hydrology, and toxic chemicals. Access to other UH laboratory space can often be arranged as needed. Small research installations are located at numerous

points around Oahu.

### **Pacific Disaster Center, UH-System-Resilience**

Managed by the University of Hawai'i, the Pacific Disaster Center (PDC) was established by the US Congress on the island of Maui in 1995. PDC fosters disaster resiliency through the use of science, information, and technology for sound, evidence-based decision-making and actively bridges the divide between scientific communities and disaster management professionals. PDC provides information research, products and services for disaster and crisis management professionals as well as executive decision makers in the fields of natural and technological hazards, and stresses to social, cultural and economic wellbeing. PDC's products and services are used in disaster response and civil-military humanitarian assistance operations, as well as in disaster risk reduction, mitigation and planning, locally and globally by stakeholders and disaster managers, national governments, regional organizations, and International and Nongovernmental Organizations. PDC's primary area of responsibility encompasses the Pacific and Indian Ocean regions, Hawai'i, and Alaska, but the center has also performed work all over the globe. PDC also provides training and capacity-building solutions, as well as exercises and workshops.

### **Lyon Arboretum, UH-Mānoa-Sustainability**

The mission of the Lyon Arboretum is to increase the appreciation of the unique flora of Hawai'i and the tropics, by conserving, curating, and studying plants and their habitats; providing inclusive educational opportunities; encouraging use by the broader community; and supporting the educational, scientific, and service activities of the University of Hawai'i. The Hawaiian Archipelago is one of the world's most isolated island groupings and supports a multitude of ecosystems that vary in complexity, content, and structure. The diversity of native plant life can be attributed to millions of years of isolation from other land masses, a remarkable diversity of microclimates occurring within short distances of one another, and a scant number of original plant founders. These factors gave rise to some of the most unique examples of insular evolution in the world. On March 6, 2016, Lyon Arboretum became an accredited arboretum, thereby joining 37 universities and colleges with ArbNet accredited arboretums including the University of Oxford in the United Kingdom, Ohio State University and American University in Washington D.C.

### **Other UH Mānoa Programs/Activities**

#### ***Resident Housing Association Student Engagement-Sustainability***

Engaged students from the Residence Hall Association in a discussion around potential sustainability projects in the dormitories. These relationships could lead to collaboration with system efforts to increase the efficiency of campus dormitories. Students have expressed interest in water efficiency, air conditioning awareness, recycling expansion and food waste education.

#### ***Mānoa Sustainability Council-Sustainability***

Participation in monthly Mānoa Sustainability Council meetings to provide student voice and enthusiasm in this newly reinstated group. Provide updates on student

sustainability efforts and build relationships with key stakeholders on campus.

### *UHMSC Groups*

Here is a list of active UHM sustainability organizations.

- About Cycle Mānoa: Cycle Mānoa is a student volunteer organization dedicated to promoting and enabling cycling on the University of Hawai'i campus, and throughout the Island. We provide bike repairs to students for free, and parts at cost, as well as hands on learning of bike repair.
- About Earth Day: The Earth Day Event at UH Mānoa is an annual tradition which promotes existing sustainability efforts on-campus and in the community to foster networking, involvement, inspiration, and a sense of momentum among student, faculty, staff, and administration in sustainability and environmental protection.
- About Hawai'i Energy Policy Forum: The Hawai'i Energy Policy Forum is a collaborative forum for sharing ideas & information, recommending & advocating policies & initiatives, and promoting civic action to achieve Hawai'i's preferred energy future. It has created a 10 point plan to meet Hawai'i's preferred energy future, and has sponsored meetings, legislative briefings, and community events.
- About NetImpact: Net Impact is a global organization of over 20,000 members, making it one of the most influential networks of students and professionals in existence today. The mission of the Hawai'i chapter is to grow and support a community of leaders focused on making a positive social, environmental and economic impact through the power of sustainable business.
- About SOFT (Student Organic Farm Training): Sustainable and Organic Farm Training is a diverse group of undergraduate and graduate students who share common interests in growing food sustainably and having fun.
- About Student Sustainability Coalition of Hawai'i/Hui Haumāna Mālama Hawai'i: The mission of the Student Sustainability Coalition of Hawai'i (SSCH)/Hui Haumāna Mālama Hawai'i (HHMH) is to cultivate a system of sustainable learning environments throughout Hawai'i. We envision fully sustainable, green and thriving campuses for a perpetual living connection between these islands and their people.
- About Surfrider-UHM: The Surfrider Foundation student chapter at UH Mānoa has the mission of protecting and enjoying our oceans through a powerful student activist network.
- About Sustainable Saunders: The Public Policy Center of the College of Social Sciences sponsors the Sustainable Saunders Initiative as a collaborative effort among faculty and students to make Saunders Hall a model of workplace sustainability. The Initiative was designated by the UH Mānoa Chancellor as a pilot project for the UH-HECO Energy Partnership.
- About Sustainable UH: The mission of Sustainable UH is to catalyze further implementation of earth-friendly practices at the University of Hawai'i at Mānoa. We envision our campus as a global hub for island sustainability.
- About the Biology Club: The Biology Club at UH Mānoa is an undergraduate Registered Independent Organization that enjoys exploring and restoring the unique island biology through hikes, snorkeling, algae clean ups, and other volunteer opportunities. With members in a wide range of majors, the Biology Club is open to anyone who appreciates the great outdoors and wants to learn.

- About the Center for Renewable Energy and Island Sustainability: The Center for Renewable Energy and Island Sustainability includes faculty and students from the College of Engineering and eight other schools and colleges to work on cutting edge research and education problems in renewable energy and island sustainability. Current funding includes a Department of Energy (DOE) grant on work force training.
- About the Ecology Club: The Ecology Club at UH Mānoa is a group of environmentally conscious students and faculty. The Ecology Club includes Environmental Studies students as well as students taking different majors. The club gets involved in service projects, field trips, field experience, and ways to giveback to the community.
- About the Environmental Center: The Environmental Center of the University of Hawai'i at Mānoa is dedicated to the advancement of environmental management through education, research and service. Established in 1970, we facilitate access to interdisciplinary expertise within the university to enhance understanding of environmental problems and to identify effective solutions.
- About the Kukui Cup: The Kukui Cup Project explores novel ways to utilize concepts from information technology, community-based social marketing, serious games, and educational pedagogy to support sustained change in sustainability- related behaviors. A defining feature of Kukui Cup challenges is a blend of real world and virtual world activities, all tied together through game mechanics
- About the Landscape Advisory Committee: The Landscape Advisory Committee promotes an attractive, appropriate, and sustainable campus environment with a Hawaiian sense of place that encourages and fosters positive academic and social interactions.
- About the USGBC Student Group at UHM: The mission of the USGBC at UH Mānoa Student Group is to help recruit, equip, and connect the next generation of leaders to the green building movement and sustainable-design industry by empowering students to transform their campuses, careers and community.
- About UHM Recycling: UH Mānoa is committed to working towards sustainability and reducing our environmental footprint. We have recycling bins across campus and have recently installed new signs to aid in properly sorting recyclables and refuse.

### ***Coordinating Sustainable UH-Sustainability***

Convened weekly meetings for Sustainable UH to build student community around sustainability and offer mentorship to budding student leaders. Students explored potential projects to improve campus sustainability, learned about agenda planning and discussed logistics for campus projects including UH Pedal Power, Mānoa Tool Library, Show Me Your Cans, Mānoa SOUP and a spring retreat.

### ***Compost Pilot Project-Sustainability***

Designed, coordinated and implemented a student led research project in using an aerated static pile compost system to absorb food waste produced on campus. This project diverted food waste from UH K. Ike Housing complex to be composted and used by the SOFT farm. This project was presented at the Fall Undergraduate Showcase and received Honorable Mention for the poster presentation.

### ***Student Sustainability Coalition of Hawai'i (SSCH)-Sustainability***



SSCH bridges a connection between students working on or passionate about environmental sustainability on University of Hawai'i campuses across the Hawaiian islands. The mission of the Student Sustainability Coalition of Hawai'i / Hui Haumāna Mālama Hawai'i is to cultivate a system of sustainable learning environments throughout Hawai'i. We envision fully sustainable, green and thriving campuses for a perpetual living connection between these islands and their people. As part of the Annual HI Sustainability in Higher Education Summit, SSCH hosts a Student Sustainability Summit every year together students passionate about sustainability from across the Hawaiian Islands.

## **UH System Programs/Activities**

### **Office of Sustainability**

#### ***Sustainability Curriculum Coordination Council-Sustainability***

Focus on coordinating existing sustainability-related curricula to develop robust sustainability studies programs utilizing existing assets and resources, supports new sustainability curriculum development.

#### ***Sustainability Council (Operations) -Sustainability***

Focus on integrating sustainability values into how we operate our campuses to reduce negative environmental impact, lower operating costs, and modernize campus facilities.

#### ***The Aloha+ Challenge Dashboard-Sustainability***

The Aloha+ Challenge is a statewide commitment to achieve six interconnected sustainability targets by 2030 in Clean Energy, Local Food Production, Natural Resource Management, Solid Waste Reduction, Smart Sustainable Communities and Green Workforce & Education. This Dashboard tracks Hawai'i's progress on achieving its sustainability targets.

#### ***Office of Energy Management-Sustainability***

The Office of Energy Management (OEM) was established in July 2016 to achieve the University of Hawai'i's Net Zero mandate to produce "as much (renewable) energy as the system consumes across all campuses, by January 1, 2035."

#### ***Hawai'i Green Growth-Sustainability***

Hawai'i Green Growth is committed to building a more resilient and sustainable future for Hawai'i. Hawai'i Green Growth serves as the backbone organization for the Aloha+ Challenge, and coordinates a broad stakeholder base to identify areas for statewide action on Hawai'i's 2030 sustainability goals. The partnership honors a collaborative and integrated approach to achieve environmental, social, and economic prosperity for future generations. Hawaiian culture and values are the bedrock of the Aloha+ Challenge and Hawai'i Green Growth, providing a trust-based framework to promote system-level change across Hawai'i.

#### ***Net Zero-Sustainability***

Net Zero Energy Consumption is energy consumed by UH or energy consumed by UH

controlled facilities. This includes energy consumed as part of the infrastructure such as parking lot lighting, building air conditioners, building lighting and electrical loads, as well as energy consumed by tenants and vendors, including those that have a dedicated utility meter that pay the utility directly. Net Zero Energy Production is energy generated directly by UH or generated by UH controlled facilities. This includes generation assets owned by UH, independent of their physical location, such as those owned by a third party but located on UH controlled lands (e.g., PV Power Purchase Agreements), and utility-scale generation on UH owned lands. This includes all forms of generation to include renewables and PV as a preferred source, but could include hydrogen, bio fuels, or other renewable sources.

### ***President's Green Initiative Awards-Sustainability***

In November 2015, the President's Green Initiative Awards were launched across all ten campuses. With financial support from private sector partners Johnson Controls and Hawaiian Electric Industries, the student award categories were designed to create additional financial resources to support students' academically anchored sustainability work, and increase the number of civically engaged students on UH campuses involved in meaningful sustainability-related projects with real-time positive impact.

- Green Project Implementation Awards - Up to \$10,000 for student-led sustainability project with measurable outcomes on UH campus or in the community.
- Green Student Leader Awards - up to \$5,000 cash awards for students who take on leadership roles in sustainability related activities.

### ***Fossil Fuel Divestment-Sustainability***

Students, faculty, and staff across the University of Hawai'i system have joined the global movement, inspired by 350.org. This campaign calls for the UH Board of Regents to pull out the millions of dollars that UH Foundation has invested in the fossil fuel industry. Current investment in fossil fuels fails to achieve the mission of UH and contributes to climate change by supporting big emitters of greenhouse gas emissions.

### ***'Ike Hawai'i/Sustainability hui-Sustainability***

Core concepts include; articulation of core cultural values for sustainability, Sustainability Curriculum Council: 2020 Curriculum Challenge, S-Designation benchmarking, SUST course descriptor code establishment to help students easily find courses, and a System-wide sustainability certificate equivalent to minor under development.