University of Hawai‘i Sea Grant College Program 2024-2027 Strategic Plan

The University of Hawai‘i Sea Grant College Program (Hawai‘i Sea Grant) conducts an innovative program of research, engagement, education, and communication services toward improved understanding— through various forms of knowledge and stewardship—of coastal and marine resources of the county, state, region, and nation. Through these activities we serve those who live, work, and recreate in coastal communities in Hawai‘i and the Pacific Region.

Hawai‘i Sea Grant embraces individuals of all ages, races, ethnicities, national origins, gender identities, sexual orientations, disabilities, cultures, religions, citizenship types, marital statuses, job classifications, veteran status types, income, socioeconomic status types, and the intersectionalities experienced by individuals. Hawai‘i Sea Grant is committed to building inclusive research, extension, communication, and education programs that serve people with diverse backgrounds, circumstances, needs, perspectives, and ways of thinking.

Hawai‘i Sea Grant is one of 34 Sea Grant College Programs nationwide that constitute a dedicated network within our nation’s coastal and Great Lakes universities and colleges to promote resilient communities with evidenced-based understanding, place-based conservation, and sustainable use of marine and coastal resources.

As an organized research unit of the University of Hawai‘i, a Native Hawaiian place of learning, at the prestigious School of Ocean and Earth Science and Technology (SOEST), and with core funding provided by the National Oceanic and Atmospheric Administration (NOAA), Hawai‘i Sea Grant connects local communities, non-profit and non-governmental organizations, industry, local and state government, federal, and academia through excellence in research, engagement, and education.

Table of Contents

PREFACE

The University of Hawai‘i Sea Grant College Program (Hawai‘i Sea Grant), in collaboration with our constituents, interested parties, and other community members and partners, initiated work to update our strategic plan in 2022 in consultation with the Hawai‘i Sea Grant Advisory Council. This document is the result of those efforts and establishes a guide for Hawai‘i Sea Grant for 2024-2027, while providing a reference for the community we serve, the people of Hawai‘i, and the Pacific Islands. This “living” document will necessarily evolve as the future unfolds.

There may arise unforeseen but compelling priorities (e.g., natural disasters, pandemics, etc.) during 2024-2027 to which the program can/will pivot when necessary. This strategic plan would allow for a flexible, nimble response to unforeseen events such as the COVID-19 pandemic and natural disasters.

Commitment to diversity, equity, inclusion, justice, and accessibility

To reaffirm our commitment to **diversity**, **equity, inclusion**, **justice, and accessibility (DEIJA),** we continue to engag**e** with our faculty and staff, our campuses, and our communities, and have unanimously agreed on the following statement which was placed on the front page of our website for the foreseeable future:

> All of us at the University of Hawai‘i Sea Grant College Program (Hawai‘i Sea Grant) recognize that we must do more than simply acknowledge what is happening in our country and across the globe…Black Lives Matter…the lives of Indigenous peoples and People of Color matter…
>
> As an organization of 45 faculty and staff at the University of Hawai‘i, Hawai‘i Sea Grant has contributed to the persistence of societal inequities due to systemic racism and colonialism. These issues are deeply rooted in ways that persist. We are committed to acknowledging this truth and doing everything we can as individuals and as an institution to dismantle these influences and actions that have for too long negatively impacted the lives of People of Color and in particular, because of these places in which we are so honored to call home, to support our Native Hawaiian and Pacific Islander colleagues, friends, communities, and cultures. Our overarching goal is to increase the sustainability and resilience of our communities, something that we cannot achieve until we fully support diversity, equity, and inclusion.
>
> Please join us.

INTRODUCTION

America's invaluable coastal economic, cultural, and environmental assets are at risk. Climate-related environmental changes have made coastal communities vulnerable in ways that were never imagined. Changing coastal uses and habitat degradation can no longer be ignored. Fisheries, once a major component of America's coastal communities, now comprise only minor sectors of our nation's coastal economies. Heightened concerns about human health and safety are focusing greater attention on port security, coastal infrastructure deterioration, and seafood safety. As hundreds of thousands more Americans move to the coast every year, it is increasingly important we find adequate ways to ensure the built environment, and the economies it supports, operate within the capacity of coastal and island ecosystems. America must use its coastal land, water, energy, and other resources in ways that preserve the health and productivity of coastal ecosystems while optimizing benefits to U.S. citizens now and in the future.

According to the U.S. Commission on Ocean Policy report (2004), the U.S. coastal zone contributed $4.5 trillion to the U.S. economy. Port and harbor industries, tourism, and the petroleum industry are now the largest components of coastal economies in most of America. Additionally, greater than one-half of the U.S. population now resides within 50 miles of the shoreline with a concomitant concentration of economic activity. The challenges we face on our coasts clearly have significant implications for the nation, not just for those living and working in coastal communities. As individuals and as a nation, we must take immediate steps to educate ourselves about the magnitude of the threats we face and respond to these in bold and creative ways. Leaders at all levels—local, state, and national—must work with the public, private sector businesses, and other organizations to utilize our collective intelligence, ingenuity, and financial resources to redefine a time of potential crisis as a time of opportunity.

Severe challenges present the greatest opportunities for change and innovation; Sea Grant is equipped and prepared to respond. A demonstrated strength of the Sea Grant College Program network is the ability to rapidly mobilize and apply the capacity of our universities and other strategic partners to address emerging challenges across the country and around the world, as well as at home. Likewise, a strength of this network is the ability, through coordinated state and regional infrastructures, to implement the mission of our parent organization, the National Oceanic and Atmospheric Administration (NOAA) at multiple levels. At this time of risk and opportunity, Hawai‘i Sea Grant will address its goals with innovation and creativity, reflecting the particular needs of Hawai‘i's and other Pacific Island coastal communities.

1.0 NATIONAL PLANNING CONTEXT

The goals and strategies outlined here, although developed for use in Hawai‘i and the central Pacific, align with NOAA’s national priorities. Hawai‘i Sea Grant’s attention to sustainable practices in coastal development and tourism, increasing community resilience to natural hazards and climate change, and accessibility and application of research to inform decision-making directly serve the needs of NOAA’s constituents and interested parties. Additionally, as an organization we strive to engage in work that expands our understanding of the nexus of coastal ecosystems and the economy, the built environment, and the cultural heritage and traditional knowledge of the host culture of the Hawaiian Islands. The urgent need for practical solutions requires coordination, cooperation, partnerships, and effective investment. The Sea Grant College Programs provide NOAA direct and immediate access to university-based capabilities and resources to achieve our mutual goals. (Figure 1).

Figure 1. Locations (blue dots) of the 34 Sea Grant College Programs that form the National Sea Grant College Program network.

Hawai‘i Sea Grant, individually and collectively via the network of university-based programs constituting the National Sea Grant College Program, continues to proactively integrate our efforts with those of NOAA. Collaborative planning efforts among the Sea Grant College Programs and NOAA ensure that NOAA’s coastal programs are focused on local and regional as well as national priorities and that efforts are coordinated, outcome-oriented, and built around our respective programs’ strengths.

National Planning Process and Strategic Approach

The NOAA National Sea Grant Office develops a National Sea Grant Network Strategic Plan (the Network Plan) every four years. The Network Plan for 2024-2027 established direction for the Sea Grant College Programs to address critical national needs in coastal, ocean, and Great Lakes environments. The plan capitalizes on Sea Grant’s unique abilities and strengths, allows for flexibility and creativity on the part of the Sea Grant College Programs, and supports priorities in NOAA’s strategic plan. The Network Plan provides guidance for the work of the Sea Grant College Programs, including the Hawai‘i Sea Grant 2024-2027 Strategic Plan. Hawai‘i Sea Grant remains committed to contributing to the realization of national goals while focusing on the specific needs, challenges, and opportunities of Hawai‘i’s interested parties, their coastal ecosystems, and associated resources.

2.0 PLANNING CONTEXT

The challenges to Hawai‘i and other Pacific Islands are significant and compounded by their geographic isolation, leaving island communities disproportionately impacted by the negative effects of climate change. On an island, local and global threats are directly felt, and securing *a healthy environment is essential for ensuring our communities are able to thrive*. Great care is required to minimize diminishment of environmental resources while simultaneously encouraging a robust economy. Clearly, this is an immense, vital task requiring commitment from end-users as well as partnerships across academia, industry, government, and local communities. The increasing environmental impacts and cost of importing resources and fossil fuels combined with local limitations such as water demand for a long- term plan for a sustainable island, a sustainable economy. Such an economy uses and protects the environmental assets of Hawai‘i and other Pacific Islands, supports our communities socially, culturally, and environmentally, and leads to greater water, food, and energy security.

Hawai‘i Sea Grant has served the people of Hawai‘i and other islands in the Pacific Region for over 50 years through leadership in coastal resource stewardship and research. The U.S. Congress established a Sea Grant institutional program at the University of Hawai‘i at Mānoa in 1968, and in 1972 designated it as a full-fledged Sea Grant College Program. Hawai‘i Sea Grant is an organized research unit within the University of Hawai‘i at Mānoa School of Ocean and Earth Science and Technology, a premier marine sciences institution. The University of Hawai‘i at Mānoa was ranked among the top 45 universities internationally for earth and environmental sciences according to the 2021 Nature Index. Hawai‘i Sea Grant serves the ten- campus University of Hawai‘i system, supporting projects and students at the flagship Mānoa campus on O‘ahu, the University of Hawai‘i at Hilo, the University of Hawai‘i West O‘ahu, the University of Hawai‘i Maui College, and six additional community colleges statewide. Hawai‘i Sea Grant also has faculty and programmatic engagement in the Pacific Region in American Samoa at the American Samoa Community College; the Republic of the Marshall Islands at the College of the Marshall Islands; and the Federated States of Micronesia in Pohnpei.

Composed of seven inhabited islands and 129 smaller islands, Hawai‘i possesses one of the longest marine coastlines in the U.S. at approximately 750 miles. In addition, no location in Hawai‘i is further than 30 miles from the ocean, making all of Hawai‘i coastal. The state’s mid-ocean location, 2,556 miles from the continental U.S. and over 3,000 miles from any other major population center, offers challenges in communications, access, and commerce. Hawai‘i’s environmental challenges and economic uncertainties threaten stability today and for generations to come. However, Hawai‘i is also unique in the assets and capacity it possesses to address environmental and coastal challenges. Aggressive goals and targets have been set by state leadership to move Hawai‘i’s communities toward sustainability. In 2015, the state of Hawai‘i enacted a law that mandates 100 percent of the state’s electricity be derived from renewable sources by 2045. Additionally, commitments have been made to effectively manage 30 percent of Hawai‘i’s nearshore environment and priority watersheds by 2030. Achievements in Hawai‘i can serve as a model for coastal communities worldwide.

Hawai‘i’s coastal communities range from ultra-urban to decidedly rural. Of Hawai‘i’s population of nearly 1.42 million, 975,000 people (almost 70 percent) live within the City and County of

Honolulu on O‘ahu[1]. In contrast, approximately 202,000 people reside in the County of Hawai‘i on Hawai‘i Island. Together, the islands of Maui, Moloka‘i, and Lana‘i in the County of Maui are home to approximately 168,000 people, with just 72,000 residing on Kaua‘i. The state’s economy is based principally on tourism, military spending, and development. Hawai‘i’s visitor population has averaged about 228,768 persons per day with half of these visitors on O‘ahu at any one time.

Planning Process and Strategic Approach

The Hawai‘i Sea Grant 2024-2027 Strategic Plan is a living guide crafted from the collective needs, opportunities, and wisdom of our coastal communities, partners, and Sea Grant network. Information included in this plan evolved through ongoing input from many sectors using a variety of engagement models to ensure broad representation. Facilitated strategic planning meetings and topically focused small group and individual discussions organized and led by Hawai‘i Sea Grant research, extension, and education faculty, administration, and staff were conducted to specifically address each of the focus areas and cross-cutting themes. In addition, a public survey was conducted to identify the priorities of our partners and the communities we serve.

Hawai‘i Sea Grant’s engagement and interdisciplinary approach is largely organized around Centers of Excellence, which serve as the embodiment and operational expression of our plan’s focus areas. We received guidance from a diversity of individuals including members of the Hawai‘i Sea Grant Advisory Council, university faculty, representatives from federal, state and county government, elected officials, Hawai‘i business leaders, representatives of private foundations, and community members at-large. In particular, we engaged the Advisory Council members on a regular and also *ad hoc* basis to continually understand the needs of the community and seek information and guidance.

In 2022, the NOAA National Sea Grant Office embarked on a strategic planning exercise for 2024-2027. These planning activities informed and facilitated Hawai‘i Sea Grant’s alignment with the National Sea Grant College Program Network Plan. Moreover, the strategic plan was also guided by the University of Hawai‘i at Mānoa Strategic Plan (2016)[2] and National Sea Grant’s 10-year Diversity, Equity, Inclusion, and Justice Vision report[3].

The Hawai‘i Sea Grant 2024-2027 Strategic Plan is also profoundly informed by the 2020 Hawai‘i Ocean Resources Management Plan (ORMP)[4]. The ORMP is a statewide plan mandated by Chapter 205A, Hawai‘i Revised Statutes. The scoping and participation conducted in updating the ORMP in 2020 involved extensive outreach and input gathering with participation of a multitude of stakeholder groups, government agencies, and the public over a period of 18 months. The ORMP is an integrated, place-based approach to ocean resources management founded on land and sea links, preserving Hawai‘i’s ocean heritage, promoting collaboration and stewardship, and adapting to changing conditions.

[1] State of Hawai‘i Department of Business, Economic Development & Tourism. 2019. Retrieved from https://census.hawaii.gov/whats-new-releases/2019-county-population-estimates/.

[2] University of Hawai‘i at Mānoa. 2016. University of Hawai‘i at Mānoa 2015–2025 Strategic Plan. Retrieved from http://www.uhm.hawaii.edu/strategicplan/.

[3] National Sea Grant’s 10-year Diversity, Equity, Inclusion, and Justice (DEIJ) Vision, Version 2. (2021). [Strategic Plan]. The National Sea Grant College Program. https://seagrant.noaa.gov/Portals/1/Network%20Visioing/DEI_VisionActions_2_0_Sea%20Grant_2022%20upload.pdf

[4] State of Hawai‘i Office of Planning. 2020. Ocean Resources Management Plan. Retrieved from https://files.hawaii.gov/dbedt/op/czm/orpm/ormp_update_reports/2020_ormp_final.pdf

3.0 OUR VISION AND MISSION FOR 2024 to 2027

VISION

Thriving and resilient ecosystems and communities supported by an engaged and informed citizenry.

This is a vision of Hawai‘i and the Pacific region in which we use our natural resources to capture the numerous benefits they provide, such as but not limited to cultural, recreational, and economic, while preserving their quality and abundance for future generations. This vision reinforces the vision articulated in the U.S. Department of Commerce Strategic Plan.

MISSION

To provide integrated research, extension and education activities that increase understanding and wise stewardship of Hawai‘i’s coastal and marine resources.

Sea Grant advances NOAA’s mission “to understand and predict changes in climate, weather, the ocean, and coasts, to share that knowledge and information with others, and to conserve and manage coastal and marine ecosystems and resources.”

Our Core Values

Accountability

---Operating with integrity and transparency while maintaining quality and relevance in all functional areas, including program management.

Diversity, Equity, Inclusion, Justice, and Accessibility

--- Proactively engaging with the range of identities, cultures, communities, and capacities present throughout our areas of work, with respect and sensitivity to each person’s experiences, history, and systemic challenges.

---University faculty, interested parties, industries, community groups, and members are involved in multi-, inter-, and trans-disciplinary research, outreach, and education activities to increase accessibility.

--- Graduate and undergraduate students from all backgrounds, including those from historically marginalized and under-resourced groups, are actively and purposefully engaged in funded research, outreach, professional development, and education.

---Diversity, equity, and inclusion at all programmatic levels to ensure our professional working environment promotes a sense of belonging and welcomes values from diverse perspectives.

Excellence

---Research is funded on a competitive basis and held to the highest standard in scientific understanding rooted in various knowledge systems and student training to strengthen professional development and diversity in the workforce as critical elements.

---Community engagement and education activities are research- and stakeholder-driven and based on local needs.

---Communication efforts utilize the best available technology to increase accessibility and

delivery of evidence-based information generated by our partnerships, researchers, and extension faculty.

Collaborations

---Seeking and sustaining partners with whom we leverage each other's strengths, and responsively, respectfully integrating diverse expertise and perspectives to reach shared goals.

Relevance

---Research, engagement, education, and communication activities are aligned with goals and strategic priorities identified in consultation with our program partners and coastal communities in Hawai'i and the Pacific Islands, together with Network Plan priorities.

Knowledge

---Collective understanding based on integrated knowledge systems and scientific evidence, such as but not limited to Indigenous, Western, Eastern, and innovative technologies.

4.0 CROSS-CUTTING THEMES

These concepts provide a common foundation for all of the following Focus Areas and the work Sea Grant conducts. Recognizing these Cross-Cutting Principles enhances Sea Grant's capabilities in order to meet future needs. Managing the natural resources in Hawai'i and the Pacific region for public and environmental health requires progress in these four fundamental areas:

- Strengthen DEIJA within our program and across the coastal communities we serve.
- Better information about sustainability and resilience, how Hawai'i's human-dominated coastal ecosystems function, and how human activities affect coastal ecosystems.
- Interested parties who understand the complexities of coastal environments and economies and how these can interact to mutual benefit.
- Management and other decision-making processes informed by evidence-based information that engage and involve a broad citizenry, and which include mechanisms to evaluate and optimize human/environmental interactions.

To facilitate progress in our four focus areas described below, we have prioritized four cross-cutting themes and goals that serve as a foundation for our work. These cross-cutting themes, and associated goals and actions, are core to Sea Grant's work and reflect the value of Sea Grant's integrated approach to engagement, research, communication, and education. Desired outcomes and performance measures are not independently identified for these cross-cutting themes. Program level cross-cutting metrics are identified that provide additional opportunity for program evaluation (please see section 4.5)

4.0 Cross-Cutting Themes		
Theme	**Goal**	**Action**
4.1 Diversity, Equity, Inclusion, Justice, and Accessibility	Strengthen, integrate, and utilize DEIJA as a focus within our program and throughout our coastal communities to fully support resilience.	Identify and address DEIJA needs, such as, but not limited to, promote environmental justice and social equity, ensure an inclusive work culture and programming, support and conduct ethical research, create resources and opportunities that are accessible, enhance diversity in workforce development and training in Hawai‘i and other Pacific Islands, and work to remove systemic barriers to historically marginalized and minoritized individuals and communities.
		Embolden personnel to learn, develop, and use tools and resources that effectively integrate DEIJA into internal and external programmatic endeavors; maintain transparency and accountability; and incorporate DEIJA into professional development, work plans, and annual reviews.
		Support and fortify the continued efforts of the Sea Grant network in enhancing DEIJA; such as DEIJA Community of Practice, DEIJA Evaluation and Professional Development Committee); and engage in DEIJA efforts with the Sea Grant Association, National Sea Grant Advisory Board, and National Sea Grant Office.
4.2 Climate Change Adaptation	A robust program of research, extension and education that supports effective decision-making and public behavior change that prepares citizens to effectively respond to climate change and motivates local, county, and state governments to incorporate climate change adaptation into management decisions and policies.	Partner with state and federal agencies to support coastal mapping, sea level monitoring and modeling at spatial and temporal scales relevant for planning decisions, and which considers environmental, social, cultural, and economic attributes.
		Engage local communities, resource managers, and scientists, in prioritizing the additional research, extension, and education activities needed to address linkages among human actions, ecosystems, and climate-related changes.
		Develop outreach and education programs that improve knowledge about climate change across generations, cultures, and sensory modalities, and facilitate the transfer of knowledge from scientists to extension agents, resource managers, planners, decision-makers, and community members.
		Engage communities in the development of policies and actions to adapt to climate change using science-based information and outreach to support improved understanding and responsible allocation of resources.

4.3 Evidence-Based Scientific Information	Scientific information to advance understanding of the nature and value of our coastal, ocean, and marine resources; to identify integrative ways to effectively conserve and use these resources; and to support evaluation of the environmental impacts and socio-economic trade-offs involved in coastal decision- making.	Play a leadership role within and outside of the Sea Grant network to increase understanding of Traditional and Local Knowledge; elevate the role of multiple knowledge systems in research, education, and communication.
		Support research to generate the scientific, technical, cultural, and legal information needed to increase understanding of coastal, ocean, and marine processes; support the development of local, innovative businesses, products, tools, and technologies; and answer the most pressing questions related to coastal and ocean resource conservation, use, and management at the state and regional levels.
		Play a leadership role within and outside the Sea Grant network to increase the amount of socio-economic research available to help decision-makers evaluate socio-economic trade-offs and assess risks to the future health and productivity of coastal, ocean and Great Lake resources.
		Improve stewardship efforts by increasing awareness and understanding of ecosystem functions and services they provide. Biodiversity, habitats, and ecosystem functions and services are restored and sustained.
4.4 Open and Informed Decision-Making	Decision-making processes that involve the full range of coastal interests, that integrate efforts of public and private partners at the federal, regional, state and local levels, and provide mechanisms for establishing common understanding and generating outcomes that recognize multiple interests.	Utilize Hawai‘i Sea Grant’s research, extension, and education capabilities to encourage and support the creation of public decision-making processes that minimize overlap, maximize effectiveness, and provide an integrated response to coastal problems and opportunities.
		Build consensus on complex issues such as coastal land use, energy development, public access, invasive species control, and climate change impacts by supporting cutting-edge research, building broader understanding among diverse constituency groups, and convening diverse groups of interested parties to work together to find common solutions.
		Strengthen partnerships to promote national, regional, and issue-related collaboration among federal, and state programs and other partners to support more effective and integrated coastal decision-making.

4.5 CROSS-CUTTING METRICS:

We gauge our programmatic achievements through the following performance metrics:

1. Core-funded proposals: number and origination of core funding pre- and full-proposals
2. Leveraged resources
3. Number of attendees at Sea Grant-sponsored/organized events
4. Number of attendees at public or professional presentations
5. Number of P-12 students who participated in Sea Grant-supported formal education programs
6. Number of P-12 students reached through Sea Grant-trained educators
7. Number of educators who participated in Sea Grant-supported professional development programs
8. Number of postsecondary students and degrees financially supported by Sea Grant in higher education programs (undergraduate, graduate)
9. Number of public or professional presentations
10. Number of peer-reviewed publications produced with Hawai‘i Sea Grant support
11. Number of Sea Grant-sponsored/organized events
12. Number of volunteer hours
13. Sea Grant staffing: number of individuals and full-time equivalents (FTEs) by Sea Grant

5.0 FOCUS AREAS

Hawai‘i Sea Grant will concentrate effort in four areas:

1. **Healthy Coastal Ecosystems**
2. **Sustainable Fisheries and Aquaculture**
3. **Resilient Communities and Economies**
4. **Environmental Literacy and Workforce Development**.

Adapted from the Network Plan, these foci emerged from national and regional strategic planning processes as areas of critical importance to the health and vitality of coastal communities and resources in Hawai‘i and the Pacific Islands. They respond to issues of major importance to NOAA and are topical areas in which Hawai‘i Sea Grant has made substantial contributions in the past. These foci also position Hawai‘i Sea Grant to make significant future contributions and are driven by the following overarching principles and realities:

- Successful mitigation of and adaptation to climate change are essential to maintain the health of the environment and human safety and welfare.
- The workforce and informed communities that our research, outreach, and education activities build are among the most important long-term assets produced through Sea Grant investment.
- Except for the direct extraction of resources (e.g., fish from the ocean) most of the issues that we face seaward of the shoreline result from the impacts of human behavior on land and associated policies.
- The environment, society, and economy are inseparably linked.
- Coastal uses and their economic importance have changed dramatically in the last 50 years and will continue to do so.
- Hawai‘i and the other Pacific Islands will become more sustainable and resilient through renewable energy, food security, innovation, and workforce development capacity building efforts.

For each focus area, we have identified goals and actions to take that will utilize our strengths in integrated research, outreach, and education and our established presence and reputation in coastal communities. Desired outcomes from our activities and related performance measures will indicate if we have achieved our goals in the shorter term. Cross-cutting performance measures and output metrics are also included to ensure we remain on track toward the long view. These elements are important guidelines but are not intended to constrain our response to emerging or unforeseen opportunities and challenges; we will continue to apply creativity and intellectual capacity to reprogram appropriately as the local context requires. The cross-cutting focus area measures for success are:

- Number of Sea Grant tools, technology, and information services that are used by our partners and interested parties to improve ecosystem-based management.
- Economic and societal impacts and benefits derived from Sea Grant activities market and non-market, jobs and businesses created or sustained, and patents.

5. 1 Focus Area: Healthy Coastal Ecosystems (HCE)

The Healthy Coastal Ecosystems focus area includes two goals and associated actions and desired outcomes.

Two performance measures are also identified for this focus area:

- Number of resource managers and community members who use ecosystem-based approaches in the management of land, water, and living resources as a result of Sea Grant activities.

- Number of acres of coastal habitat protected, enhanced, or restored as a result of Sea Grant activities.

Focus Area: Healthy Coastal Ecosystems

Goal: Habitat, ecosystems, and the services they provide are protected, enhanced, and/or restored.	
Action	**Desired Outcome**
Identify, develop, and share scientific understanding, decision-support tools, technologies, and best practices to protect and restore ecosystems.	Scientific understanding and technological solutions inform and improve the management and conservation of natural resources.
	Ecosystem science and conservation priorities developed through stakeholder participation are addressed.
	Greater awareness and understanding of ecosystem functions and services they provide improves stewardship efforts.
Sustain the habitat, biodiversity, and abundance of coastal ecosystems, fish, wildlife, and plants.	Biodiversity, habitats, and ecosystem functions and services are restored and sustained.
	Improved collaborative planning and decision-making leads to enhanced stewardship.
Goal: Land, water, and living resources are managed by applying science, tools, and services to sustain resilient coastal ecosystems.	
Action	**Desired Outcome**
Support a science- and management-driven framework that integrates research, observations, monitoring, and modeling to provide a scientific basis for informed decision- making.	Inclusive collaborations with partners and other interested parties support planning, research, and innovative solutions to address coastal resource management needs, especially for vulnerable communities.
	Community science initiatives are utilized and contribute to improving our knowledge with respect to stewardship of ecosystems and their contributios to coastal communities and economies.
	Coastal communities and resource managers have access to and use science, data, tools, and training to be effective in planning and decision-making processes.
	Resource managers and communities understand the risks, options, trade-offs, and impacts of their decisions.
Identify and advance successful strategies that enhance resilient ecosystems and watersheds in the context of changing conditions, including environmental variability and climate change.	Communities share, understand, and use information regarding projected changes and related impacts within coastal ecosystems.
	Communities can apply knowledge from case studies, training, and tools to improve their ability to plan, prepare, and adapt to environmental variability and climate change.

5. 2 Focus Area: Sustainable Fisheries and Aquaculture (SFA)

The Sustainable Fisheries and Aquaculture focus area includes two goals and associated actions and desired outcomes.

One performance measure is also identified for this focus area:

- Number of fishers, seafood processors, and aquaculture industry personnel who modify their practices using knowledge gained in fisheries sustainability and seafood safety as a result of Sea Grant activities.

Focus Area: Sustainable Fisheries and Aquaculture

Goal: Fisheries, aquaculture, and other coastal and freshwater natural resources supply food, jobs, and economic and cultural benefits.	
Action	**Desired Outcome**
Support development of a trained and diverse workforce and enhance technology transfer in a manner that recognizes a variety of methodologies and approaches, including those based on Traditional and Local Knowledge.	Increased understanding and technological solutions aid management and production.
	Engagement with interested parties and partnerhips enable the industry to acquire innovative technologies and adapt to changing conditions.
Promote and support harvesting, culturing, and processing techniques that lead to safe, sustainable, and high-quality food as well as social, ecosystem, and economic benefits.	Coastal residence and U.S. seafood consumers understand the benefits of domestically-produced seafood, both wild and farmed, for individual and environmental health.
	Coastal resource industries employ technologies and reinforce strategies to ensure safe and sustainable products.
	Coastal resource industries employ strategies that balance economic, community, and conservation goals.
Goal: Natural resources are sustainably managed to support fishing coastal communities and working waterfronts, including commercial, recreational, subsistence fisheries, and aquaculture.	
Action	**Desired Outcome**
Ensure science, services, and tools are available to and trusted by resource managers, the fishing and aquaculture communities, and consumers.	Commercial and recreational fishers and aquaculturists are knowledgeable about efficient, sustainable, and responsible tools, techniques, and uses of coastal and freshwater resources.
	Resource managers and fishing and aquaculture communities have access to science and share diverse knowledge and tools to increase their capability to adapt to changing resource management needs, including those driven by climate change
	Consumers understand the health and sustainability benefits of domestically produced seafood and use that knowledge to inform their seafood purchasing decisions.

5. 3 Focus Area: Resilient Communities and Economies (RCE)

The Resilient Communities and Economies focus area includes two goals and associated actions and desired outcomes.

Two performance measures are also identified for this focus area:

- Number of communities that adopt/implemented sustainable economic and environmental development practices and policies as a result of Sea Grant activities.

- Annual number of communities that adopt/implemented hazard resilience practices to prepare for and respond to/minimize coastal hazardous events as a result of Sea Grant activities.

Focus Area: Resilient Communities and Economies

Goal: Coastal communities have the capability and resources to prepare for and adapt to extreme and chronic weather and coastal hazards, climate change, economic disruptions, and other threats to community health and well-being.	
Action	**Desired Outcome**
Improve and expand exchanges of knowledge to better identify the diverse needs of communities and to increase the public's understanding of changes conditions and related impacts.	Scientific understanding, including Traditional and Local Knowledge, provides foundational information, and all community members understand the impacts of changing conditions and coastal hazards and have the capability to prepare, respond, and adapt.
	Community leaders improve their understanding of changing conditions and coastal hazards and their capability to implement mitigation and adaptive strategies.
Work with communities to advance collaborative comprehensive planning, actionable science, and adaptive management strategies.	Inclusive collaborations with diverse partners and interested parties support mitigation and adaptation efforts built on knowledge from and responsive to the needs of all, especially the most vulnerable.
Work with communities to explore and support diversification, strengthening, and sustainability and social equity within coastal economic sectors and the blue economy.	Communities have access to and share knowledge, tools, services, and technologies to adapt and grow resilient economies.
	Leaders in coastal economic sectors understand how they can become more resilient through diversification including expanded renewable, regenerative, and clean practices.
Goal: Water resources are enhanced, sustained, and protected to meet existing and emerging needs of the communities, economies, and ecosystems that depend on them.	
Action	**Desired Outcome**

Use engagement and information exchange to advance the understanding of how actions impact water quality, quantity, and availability.	Community members understand watershed and coastal functions and the ecosystem services they provide, understand how their actions will impact water resources, and are able to inform decisions.
Collaborate with diverse partners and interested parties, especially the most vulnerable, to advance plans and management practices for protecting and managing water resources.	Communities work with knowledge networks to share and access science, data, tools, and services to anticipate changes in water resources, to protect and sustain water resources, and to make informed decisions.
	Communities have diverse, sustainable economies and industries that support the existing and emerging water resource needs.

5. 4 Focus Area: Environmental Literacy and Workforce Development (ELWD)

The Environmental Literacy and Workforce Development focus area includes two goals and associated actions and desired outcomes.

Three performance measures are also identified for this focus area:

- Number of Sea Grant products that are used to advance environmental literacy and workforce development.
- Number of people (youth and adults) engaged in Sea Grant-supported nonformal education programs.
- Number of Sea Grant-supported graduates who become employed in a job related to their degree within two years of graduation.

Focus Area: Environmental Literacy and Workforce Development

Goal: A diverse, skilled, and environmentally literate workforce that is engaged and able to build prosperous lives and livelihoods in a changing world.	
Action	**Desired Outcome**
Identify and remove barriers to accessing training and learning opportunities so that diverse populations are connected to and prepared for the range of career paths that support the needs of coastal communities.	All members of a community are enabled to explore and pursue the variety of occupations that are essential to sustain coastal communities, economies, and ecosystems.
Increase opportunities for students at all levels (P-12, undergraduate, post-graduate, and technical and vocational) to gain knowledge and experience addressing issues that are important to our ocean and coasts, and their respective watersheds.	Student opportunities provide increased literacy, experience, and preparedness in critical disciplines, skills, and issues.
	Students from all backgrounds and with diverse needs are thoughtfully and intentionally supported in and have access to formal, nonformal, and experiential learning, training, and research experiences.

Develop and carry out programs that help people discover, create, and grow within careers that support the current and future needs of coastal communities and ecosystems and to adapt and thrive in changing conditions.	Employment in coastal and watershed communities expands and diversifies.
	The existing and future workforce is able to adapt and thrive in changing environmental, social, and economic conditions.

6.0 IMPLEMENTATION

6.1 The Center of Excellence Model

A nationally recognized *Best Practice* highlighting collaboration and connecting University, local, state, regional, national, and international partners in areas of importance to Hawai‘i.

Hawai‘i Sea Grant continues to develop and refine a paradigm to implement strategic priorities and goals through its Center of Excellence model. Centers of Excellence (Centers) include researchers, extension faculty, state and local government representatives, industry, and community members as well as “non-traditional” Sea Grant partners such as the U.S. Geological Survey and the American Institute of Architects, among others. The Centers build connectivity among academics and other interested parties who can benefit from their scholarship. Linking researchers and users also allows researchers to directly learn from communities about their needs. The Centers also provide for inter-college, inter-school and inter-departmental collaboration not readily facilitated by traditional academic institution structure. The Center model has been embraced by the University of Hawai‘i administration, which recognizes its value to the university at-large, via support to Hawai‘i Sea Grant including university administration salary support for Center directors and the hiring of a cluster of coastal sustainability resilience faculty described below.

The interdisciplinary Centers provide a vehicle for building connections university-wide, engaging the best and brightest minds available to address issues facing coastal communities. The Centers have successfully attracted faculty participation from the Schools of Architecture, Travel Industry Management, and Hawai‘inuiākea School of Hawaiian Knowledge; the Colleges of Business and Education; and the Departments of Urban and Regional Planning, Geography, Economics, Oceanography, Natural Resources and Environmental Management, and Geology and Geophysics, as well as the University of Hawai‘i Joint Institute for Marine and Atmospheric Research, one of 20 Joint/Cooperative Institutes under NOAA’s Office of Oceanic and Atmospheric Research. Hawai‘i Sea Grant researchers and extension faculty working through the Centers have significantly expanded their project efforts through increased collaboration with multidisciplinary center faculty.

The Centers have also been playing an increasing role in defining the Hawai‘i Sea Grant research agenda. They are involved with projects that directly affect or impact coastal communities and are keenly aware of existing knowledge gaps to be addressed to help interested parties. The Centers have also been very effective in disseminating research results to the community at-large.

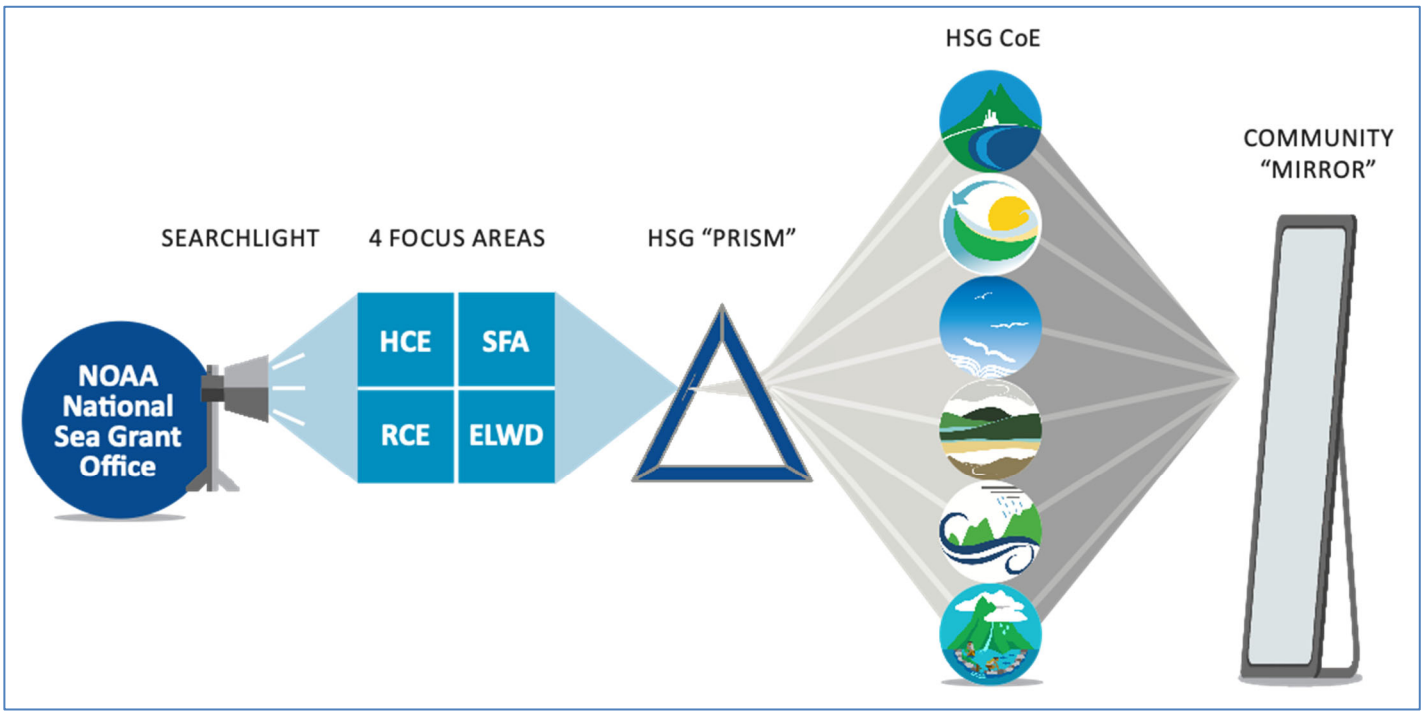


Figure 2. A schematic illustrating how the Centers of Excellence (CoE) serve as the place-based expression and functional implementation of the Sea Grant National Office focus areas.

The Centers also serve as a mechanism for regional collaboration among the Sea Grant College Programs. The inaugural Center for Smart Building and Community Design has provided a dynamic and successful platform for collaborative activities among Hawai‘i Sea Grant and Oregon Sea Grant, Texas Sea Grant, Maine Sea Grant, Rhode Island Sea Grant, Mississippi/Alabama Sea Grant, Louisiana Sea Grant, and other network programs. Similarly, the Center for Sustainable Coastal Tourism led an effort involving Delaware Sea Grant, Michigan Sea Grant, Pennsylvania Sea Grant, and Indiana-Illinois Sea Grant to co-organize and conduct a session at the 25th International Congress on Coastal and Marine Tourism in Kailua-Kona, Hawai‘i, which highlighted Sea Grant coastal tourism activities focused on sustainability and resilience.

In short, the Centers encompass Hawai‘i Sea Grant’s mission while providing the critical service of focusing program resources to optimize effectiveness. The Centers also play a significant role in broadening engagement in Hawai‘i Sea Grant’s strategic planning activities. Perhaps most importantly, they serve as the functional realization and embodiment of both national and state focus areas. By conducting integrated research, outreach, and education activities they serve as the implementation arm of Sea Grant and play a critical role in dissemination of evidence-based information among researchers and to users to inform coastal resource management and policy decisions.

Creating and supporting economically, socially, and culturally inclusive, equitable, and resilient communities that work within the carrying capacity of their environments.

Hawai'i Sea Grant and the School of Architecture established the ***Center for Smart Building and Community Design*** *(CSBCD) in 2004. This unique partnership combines design and planning with the natural and social sciences to address issues related to development and urbanization, and their impacts on the natural and human environments and climate change. The core mission of the CSBCD is to encourage vibrant, resilient, coastal communities that exist sustainably within their environmental footprint and exemplify restorative pathways in building design and community development. The CSBCD seeks to consolidate partnerships and focus university expertise, resources, and networks to assist stakeholders in demonstrating long-term solutions in the built environment.*

KEY PARTNERS: University of Hawai'i at Mānoa: School of Architecture, College of Social Sciences, School of Ocean and Earth Science and Technology, Hawai'i Natural Energy Institute, Office of Sustainability; State of Hawai'i Office of Planning; State of Hawai'i Energy Office; City and County of Honolulu Office of Climate Change, Sustainability, and Resilience; City and County of Honolulu Department of Planning and Permitting; County of Maui Department of Planning; County of Kaua'i Department of Planning; Department of Hawaiian Home Lands; WSP Built Ecology; American Institute of Architects; NOAA Office of Coastal Management.

CENTER FOR
SMART BUILDING & COMMUNITY DESIGN

SERVES TO:

- ✓ Contribute to sustainable, resilient building and community design through research that informs practices and policies
- ✓ Provide guidance to reduce energy and water use in buildings and communities to mitigate climate change and meet Hawai‘i’s 100 percent clean energy goals
- ✓ Conduct research on how to maintain thermal comfort while using little energy and preparing for future warmer weather

RESULTING IN:

Resilient communities that sustainably utilize energy and water resources, are prepared to adapt to future climate change, and support social equity

Sea Grant
University of Hawai‘i

SIGNATURE PROJECTS

DEMONSTRATE NET-ZERO ENERGY USE

Published a study demonstrating how to reduce energy use in multifamily residential buildings in subtropical climates to achieve net-zero energy use and mitigate climate change by reducing emissions produced by buildings.

?

WHAT IS “SMART BUILDING”?
The process of designing and constructing a structure while considering how it will interact with its inhabitants and its environment.

WHAT IS “COMMUNITY DESIGN”?
A holistic approach to development; it is mindful that neighborhoods, towns, and cities can be more sustainable and inclusive in their design.



ENERGY EFFICIENCY IN DETACHED HOUSES

To support Hawai‘i’s 100 percent renewable energy goal by 2045, a peer-reviewed paper, brochure, and video were developed to show how house design can be modified to meet the new energy codes and renewable energy goals.


ENVISIONING SEA-LEVEL RISE ADAPTATION IN WAIKĪKĪ

As a major tourist destination, Waikīkī cannot immediately retreat from sea-level rise, and will need to rely on an “in-place” adaptation strategy. This project is the first to address this challenge and merges architectural design with climate science to create visual renderings.

The Ala Wai watershed, which includes Waikīkī, is ***the most densely populated watershed*** in Hawai‘i, accounting for nearly **20%** of O‘ahu’s population.

Conducting research, education, and outreach to advance an ethical, responsible, and vibrant tourism economy while ameliorating visitor impact on culture and the environment, and increasing visitor understanding of marine and coastal environments.

*The **Center for Sustainable Coastal Tourism** (CSCT), established in 2009, is a collaboration among the College of Social Sciences, School of Ocean and Earth Science and Technology, School of Travel Industry Management, Hawai'inuiākea School of Hawaiian Knowledge, and School of Architecture. In partnership with local businesses, government, and the community, the CSCT conducts research, outreach, and education activities on sustainable coastal tourism in Hawai'i and various economic, cultural, and environmental impacts of the visitor sector. The primary focus of the CSCT is to support applied research and extension and outreach efforts that support a regenerative tourism model that contributes to the overall well being of the local community, and improve the quality of Hawai'i's natural environment.*

KEY PARTNERS: University of Hawai'i at Mānoa: College of Social Sciences and School of Travel Industry Management; State of Hawai'i Department of Land and Natural Resources-Office of Conservation and Coastal Lands; State of Hawai'i Department of Business, Economic Development and Tourism; the Hawai'i Tourism Authority; City and County of Honolulu; Waikīkī Improvement Association; and the Waikīkī Special Improvement District Association.

CENTER FOR SUSTAINABLE COASTAL TOURISM

SERVES TO:

✓Support regenerative and sustainable tourism

✓Conduct beach and marine ecosystem restoration and maintenance

✓Develop and foster strategic partnerships between the university and the visitor industry to support sustainable tourism initiatives

RESULTING IN:

Positive impacts on the sustainability of the tourism industry and improve the quality of Hawai'i's environment

Sea Grant University of Hawai'i

SIGNATURE PROJECTS

BEACH RESTORATION IN WAIKĪKĪ

Restoring and ***maintaining*** the health and vitality of these natural resources is integral to the continued economic contributions of Hawai'i's flagship visitor destination. Simultaneously, this supports a healthy environment for surfing, paddling, fishing, and other ocean-based activities that contribute to the overall quality of life for Hawai'i residents.

Waikīkī is the state's **LARGEST** tourist destination.

Hawai'i Sea Grant extension faculty provide scientific, technical, and policy support for beach restoration in Waikīkī.

Projects include:
- Public and private property issues
- Coastal land use
- Coastal hazard mitigation
- Coastal erosion control
- Beach and dune conservation and restoration

WINDWARD OAHU TOURISM ASSESSMENT

Hawai'i Sea Grant surveyed the community to measure the perception related to tourism benefits and impacts in Windward O'ahu

The project evaluated and prioritized potential options to address the community priorities.

It also provided a baseline estimate of visitors at representative Windward communities.

SUSTAINABLE TOURISM SYMPOSIUM

Brought together experts to support regenerative tourism in Hawai'i and develop sustainable tourism best practices, and research sustainability opportunities in energy, water, and resource use for the visitor industry.

Providing leadership and support to formal and informal educational institutions and organizations through the education of scientists, professionals, teachers, and the public about the benefits of wise and sustainable stewardship of coastal and ocean resources in Hawai'i and the Pacific region.

*The **Center for Marine Science Education** (CMSE), established in 2008, builds partnerships that enhance marine science education at all levels, lifelong, to foster understanding of the natural world, the critical importance of our earth's oceans and the role of humans in it.*

Ocean and aquatic sciences are among the most underrepresented disciplines in K-12 curricula. Even in Hawai'i, where the ocean is a daily part of life and Hawaiian cultural practices recognize the connectivity of land and sea, ocean knowledge is rarely connected to school learning. The CMSE is a place that scientists and educators look to for ideas and support, acting as both a repository and a point of initiation for new projects to bridge the gap between daily life, culture, and ocean science research, and education. The aim of the CMSE is to facilitate partnerships and connections among scientists, teachers, students, and life-long learners and enhance understanding, literacy, and appreciation of the marine and coastal environments.

KEY PARTNERS: University of Hawai'i at Mānoa: College of Education, Curriculum Research & Development Group, Center on Disability Studies, Hawai'i Institute of Marine Biology, and Center for Pacific Island Studies; NOAA: Hawaiian Islands Humpback Whale National Marine Sanctuary, Office of Coastal Management, Pacific Region Outreach Group; Hawai'i State Department of Education; and City and County of Honolulu Department of Parks and Recreation.

CENTER FOR
MARINE SCIENCE EDUCATION

SERVES TO:

- ✓ Build partnerships and enhance marine science education at all levels
- ✓ Connect scientists, teachers, students, and life-long learners
- ✓ Act as a repository and a point of initiation for new ocean science and ocean education projects

RESULTING IN:

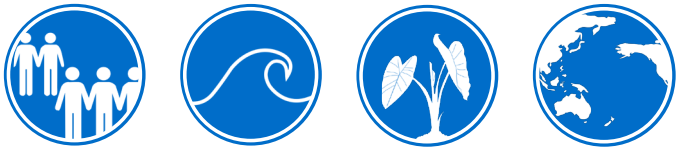
Enhanced understanding and appreciation of the marine and coastal environment

Sea Grant
University of Hawai'i

SIGNATURE PROJECTS

CARING FOR OUR ISLANDS THROUGH NA KILO ʻĀINA

The Na Kilo ʻĀina network is working directly with community members of all ages to actively care for the shoreline and marine environment through ongoing, monthly monitoring activities and training.



KILO were people who made detailed observations of the nuances of their surroundings in relation to their cultural practice and livelihood.

ʻĀINA refers to our lands and oceans which are our sources of sustenance.

VOICE OF THE SEA

The original, half-hour television series airs throughout Hawai'i and the Pacific and shares stories of current research and local cultures, perpetuating traditional knowledge and promoting careers in ***Science, Technology, Engineering, and Mathematics*** (STEM).

40 Since launching in 2014,VOS has won **TELLY AWARDS**, the premier award for regional television.

Episodes are also available online, with links to additional resources, activities, and curriculum.
VOICEOFTHESEA.ORG

HANAUMA BAY EDUCATION PROGRAM

Created and operated by Hawai'i Sea Grant, the Hanauma Bay Education program has been educating visitors for more than

30 years

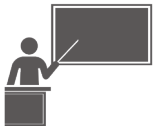
1967

DECLARED HAWAI'I'S FIRST MARINE LIFE CONSERVATION DISTRICT

APPROXIMATELY 350,000 ANNUAL VISITORS ARE EDUCATED ON THE VALUE OF MARINE RESOURCES AND APPROPRIATE BEHAVIOR

Home to some of the most colorful, unique marine life in the world.

A premier snorkeling location.



Public events share marine and coastal research with the community.

Supporting, enhancing, perpetuating, utilizing, and learning from past understanding and practices derived through traditional knowledge and cultural heritage in Hawai'i and the Pacific region to integrate and inform current research, outreach, and education activities.

*The **Ulana 'Ike Sea Grant Center of Excellence**, (formerly called the Center for Integrated Knowledge Systems) seeks to serve as a collaborative hub coordinating Sea Grant faculty and partners who work on projects that engage multiple knowledge systems. The vision of Ulana 'Ike is that customary practitioners from multiple knowledge systems have decision-making power and direct co-management of coastal and marine resources. Place-based stewardship requires drawing from multiple knowledge systems in order to achieve authentic co-management. What constitutes "legitimate knowledge" for the purposes of decision-making can be limited. The work of the staff and faculty within this Center are deeply aligned with the values, communities, and knowledge of Hawai'i and the Pacific (Moananuiākea), and are motivated to advance Indigenous cultural survival, restoration, self determination, and healing. This is necessary because, too often, customary beliefs, values, and practices are not viewed as a valid basis for action.*

The name Ulana 'Ike draws upon the archetypal imagery of weaving or braiding together distinct knowledge systems. Across Moananuiākea, the hala plant (Pandanus tectorius) is foundational to the Pasifika identity, featuring prominently in cosmogonic origin stories and mythologies. Ulana, or weaving leaves of the hala tree for canoe sails, building materials, and mats, is a practice shared by the people of Moananuiākea.

KEY PARTNERS: University of Hawai'i at Mānoa: Chancellor's Office, Hawai'inuiākea School of Hawaiian Knowledge, College of Education, College of Tropical Agriculture and Human Resources, and School of Ocean and Earth Science and Technology; University of Hawai'i System; University of Hawai'i at Hilo; NOAA Pacific Islands Regional Office; and National Science Foundation Experimental Program to Stimulate Competitive Research (EPSCoR).

ULANA ʻIKE
SEA GRANT
CENTER OF
EXCELLENCE

SERVES TO:

✓ Draw from multiple knowledge systems in order to achieve authentic co-management and place-based stewardship

✓ Advance Indigenous cultural survival, restoration, self-determination, and healing

RESULTING IN:

Increased coordination of Hawaiʻi Sea Grant projects involving Indigenous knowledges and communities, and enhanced connection to a broader community of Indigenous scholars.

Sea Grant
University of Hawai'i

SIGNATURE PROJECTS

The practice of weaving together knowledges can be uncomfortable and challenging especially when applied across knowledge systems that occupy different positions of privilege and power. However, in this place of discomfort, there is also a ***tremendous opportunity for growth***.

KŪLANA NOIʻI

A set of guidelines to help ensure that research projects engage in equitable and reciprocal partnership with those connected to and caring for the ahupuaʻa which serves as a starting point for deeper conversation. It lays out a set of ideas, values, and behaviors that, when applied alongside hard work, can build more just and generative relationships between researchers and communities.

SCIENCES AND THE SACRED

A speaker series designed to create safe, generative spaces for the University of Hawaiʻi community to come together in a dialogue about complex issues, and to explore topics from various knowledge systems.

In spring 2022 the seminar series centered conversations in a knowledge-sharing exchange to advance kanaka ʻōiwi efforts towards data sovereignty.
SCIENCESANDTHESACRED.COM

COMMUNITY BASED SUBSISTENCE FISHING AREA

HAʻENA

IN 2014, rules were approved by the state and ***signed into law by the Hawaiʻi Governor in August 2015***, creating the state's very first community-based subsistence fishing area.

Other communities in Hawaiʻi have embarked on a similar process to protect their nearshore resources and are using the lessons learned from Haʻena to guide their efforts.

Promoting trans- disciplinary collaboration among university, community, and government partners to address critical and emerging issues relating to all aspects of coastal and climate science and management throughout Hawai'i and the U.S.-affiliated Pacific Islands.

After building capacity and achievements in this realm for more than ten years, the ***Center for Coastal and Climate Science and Resilience*** *(CCCSR) was formally established in 2016 to increase support for collaborative and transdisciplinary coastal and climate research, outreach, and education to understand and address impacts of coastal hazards, climate change, and sea-level rise in Hawai'i and the Pacific region. University of Hawai'i researchers and Hawai'i Sea Grant extension faculty working through the CCCSR significantly amplify project impacts and outcomes through increased collaboration and involvement of multidisciplinary center faculty. The CCCSR engages a broad range of regional stakeholders involved in coastal community resilience and coastal ecosystem management to inform the CCCSR's research agenda, advise decision-makers on potential impacts of climate change and the implementation of adaptation measures, and improve sustainable management of public coastal resources and shoreline land use.*

KEY PARTNERS: University of Hawai'i at Mānoa: Joint Institute for Marine and Atmospheric Research, Coastal Geology Research Group and Department of Geography; International Pacific Research Center; NOAA: Pacific Islands Ocean Observing System and National Ocean Service Sentinel Sites Program; U.S. Geological Survey Pacific Islands Climate Science Center; State of Hawai'i: Department of Land and Natural Resources-Office of Conservation and Coastal Lands and Office of Planning; County of Maui Department of Planning; County of Kaua'i Department of Planning; and the City and County of Honolulu Department of Planning and Permitting.

CENTER FOR
COASTAL & CLIMATE SCIENCE & RESILIENCE

SERVES TO:

- ✓ Provide access to and improve understanding of the best available science for decision-makers and local communities
- ✓ Increase coastal community resilience to natural hazards and adaptation to climate change
- ✓ Improve conservation and management of coastal resources

RESULTING IN:

Resilient coastal communities that are better prepared for the impacts of natural hazards and climate change

Sea Grant University of Hawai'i

SIGNATURE PROJECTS

PACIFIC ISLANDS SEA LEVEL RISE ADAPTATION SCIENCE DIALOGUES

Hawai'i Sea Grant and the **PACIFIC ISLANDS CLIMATE ADAPTATION SCIENCE CENTER (PI-CASC)** with university and government partners are working to improve coproduction and collaboration in addressing needs for sea level rise adaptation science through ongoing dialogues and information sharing.

HAWAI'I AND PACIFIC ISLANDS KING TIDES PROJECT

Members of the general public, or "community scientists," contribute photographs documenting the impacts of **PERIGEAN TIDES** (or King Tides) on coastal resources and infrastructure. The project and photos collected have been featured in research and planning documents and local and national news.

Hawai'i & Pacific Islands KING TIDES PROJECT

As sea-level rise 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.

CONSERVATION AND RESTORATION OF COASTAL ENVIRONMENTS

Projects in cooperation with local government to improve management of Hawaii's beach and dune environments:

- Hawai'i Dune Restoration Manual
- Coordination of dune restoration projects on Maui and statewide
- Coordination of a statewide Small-Scale Beach Restoration permitting program
- Beach maintenance in coastal tourism areas of Waikīkī, O'ahu and Ka'anapali, Maui

SEA LEVEL HAS RISEN OVER THE LAST CENTURY ON EACH ISLAND AT RATES VARYING FROM **0.5-1.3 INCHES** PER DECADE

Providing leadership, support, and coordination for the cultivation of iʻa through Indigenous and western practices for food sustainability throughout Hawaiʻi and Pacific island communities.

*The **Pacific Region Aquaculture and Coastal Resource Hub** builds strategic partnerships that revitalize and expand aquaculture development in the region. It seeks to improve and support aquaculture practices, restoration, and success of traditional Hawaiian fishponds, management of coastal resources, Science, Technology, Engineering, and Math (STEM) education, and the economic condition of the state. The Hub aims to be a major source for aquaculture and coastal resource-related research and products, and will encourage participation and contributions from all University of Hawaiʻi System departments to achieve its mission of linking the aquaculture industry with the sustainability of our natural resources, promotion of healthy coastal ecosystems, and respect for our indigenous people and the unique multicultural fabric of our society. The collaborative efforts will include researchers, extension faculty, federal, state and local government staff, nonprofit organizations, industry, and community members.*

KEY PARTNERS: University of Hawaiʻi at Hilo Pacific Aquaculture and Coastal Resources Center; University of Hawaiʻi at Mānoa College of Tropical Agriculture and Human Resources; University of Guam Sea Grant Program; Washington Sea Grant; The Marine and Environmental Research Institute of Pohnpei; Hawaiʻi Aquaculture and Aquaponics Association; American Samoa Community College; College of the Marshall Islands; Kuaʻāina Ulu ʻAuamo; National Oceanic and Atmospheric Administration Pacific Islands Regional Office; Hawaiʻi Department of Agriculture Aquaculture and Livestock Support Services; Natural Energy Laboratory of Hawaiʻi Authority; HATCH Accelerator; University of Hawaiʻi Windward Community College; and Waiwai Ola Waterkeepers Hawaiian Islands.

PACIFIC REGION AQUACULTURE & COASTAL RESOURCE HUB

SERVES TO:

- ✓ Address the needs of Indigenous aquaculture practitioners and aquaculture industry in Hawai‘i and the Pacific region through integrated research, extension, and education services
- ✓ Provide formal and informal educational opportunities that support the development of the next generation of aquaculturists, practitioners, and managers
- ✓ Strengthen and increase strategies to improve food security through sharing science and traditional ecological knowledge

RESULTING IN:

Resilient and thriving coastal communities that reduce their dependence on imported seafood by increasing local food production sustainably through aquaculture

Sea Grant
University of Hawai‘i

SIGNATURE PROJECTS

HAWAI‘I AQUACULTURE COLLABORATIVE (HAC)

Engages 30 aquaculture industry leaders from different segments of Hawai‘i’s aquaculture industry including loko i‘a (Hawaiian fishponds); open-ocean, freshwater, land-based and ornamental aquaculture operations; and aquaponics. The HAC seeks to strengthen and grow aquaculture in Hawai‘i through increased government support, technology and research, workforce development, communications and marketing, and processing and feed.

ADDRESSING COVID-19 IMPACTS TO LOCAL FOOD SECURITY

In an effort to support traditional cultural and aquaculture practices, Hawai‘i Sea Grant collaborated with the Pacific American Foundation and Kua'āina Ulu 'Auamo to design and construct a land-based tank system to acclimate hatchery-raised fish fry and macroalgae for wild restocking, sale, and consumption at Waikalua Loko I‘a.

CROSS-PACIFIC INDIGENOUS AQUACULTURE COLLABORATIVE HUB

Initiated the Cross-Pacific Indigenous Aquaculture Collaborative Hub in 2019 to advance knowledge, implementation, outreach, and education of Indigenous aquaculture practices and enhance marine food production for cultural-ecological benefits in the broader Pacific region, in partnership with Washington Sea Grant, Alaska Sea Grant, and others.

GOFISH HAWAI‘I

In this beginning farmer training program for aquaculture, participants learn how to integrate small-scale aquaponics systems into existing farm operations. Those who complete the program have the opportunity to continue learning through activities and monthly training for approximately one year.

6.2 The Sustainability Strategic Hires

The University of Hawai‘i at Mānoa recognized the excellence of Hawai‘i Sea Grant and its longstanding commitment to coastal sustainability by initially awarding the program seven permanent faculty positions in 2012 as the result of a competition among 11 university-based proposals. One of those positions was not continued due to a hiring freeze. Over the next 30 years, these faculty represent an investment of more than $50 million in Hawai‘i Sea Grant’s research and outreach programs. To our knowledge, this is an unprecedented commitment on the part of a university to a Sea Grant College Program and our parent organization, NOAA. These coastal resilience sustainability hires greatly increase Hawai‘i Sea Grant’s ability to address diverse challenges, needs, and opportunities for decades to come.

The six coastal resilience sustainability faculty embodies integrated research, outreach, and education efforts focused on deepening our understanding of the energy-water-food nexus while realizing the development and implementation of energy and water conservation, technology, and design practices toward a resilient, economically and socially inclusive future for Hawai‘i’s people. These faculty are also making significant contributions in transportation science, community design, and “greening” infrastructure. Effective implementation of new technologies requires that Hawai‘i’s communities make informed decisions based on an understanding of their environmental, social, engineering, and economic impacts, as well as alternate technologies’ strengths and limitations compared with “business-as-usual.” The six coastal resilience sustainability faculty are tenured and each have joint research and outreach appointments to formally support the Sea Grant mission.

These faculty build on the established partnerships of our Centers of Excellence by integrating science and design into decisions on development and public policy in coastal communities. These hires, recruited under a rubric of multi-, inter- and trans-disciplinary collaboration, strategically add faculty capability to existing partnerships facilitated and supported through the Centers of Excellence and partner schools/colleges. By intention, these faculty hold loci of tenure in their respective areas of expertise within collaborating schools and colleges of he University of Hawai‘i at Mānoa including the Department of Oceanography in the School of Ocean and Earth Science and Technology, and Departments of Economics in the College of Social Sciences, the Department of Civil and Environmental Engineering in the College of Engineering, the Department of Natural Resources and Environmental Management in the College of Tropical Agriculture and Human Resources, the School of Architecture, and the Hawai‘inuiākea School of Hawaiian Knowledge.

6.3 Research Proposal Process

Hawai‘i Sea Grant research is a critical element of programmatic implementation through its core research value, including graduate education, but also by serving as a significant foundation for extension activities. The *Hawai‘i Sea Grant 2024-2027 Strategic Plan* encompasses two research funding cycles, each of two years duration. The 2024-2026 research component will be initiated by a request for proposals (RFP) announced in December 2022. The request will be sent to University of Hawai‘i departments at the Mānoa and Hilo campuses, the University of Guam, Brigham Young University of Hawai‘i, Chaminade University, and Hawai‘i Pacific University, as well as to community colleges in the insular Pacific. The RFP will also be placed in the University of

Hawai‘i campus bulletin, shared via social media, and sent to an extensive email listserv to achieve broad distribution.

The RFP process consists of two general phases, a pre-proposal request and subsequent development and submission of select full proposals as described below. All complete pre-proposals submitted undergo the following. The Hawai‘i Sea Grant Advisory Council meets to advise Hawai‘i Sea Grant on the relevance of submitted pre-proposals to constituents and the greater community. In addition, Hawai‘i Sea Grant extension faculty provide their input on pre-proposal relevance. To complete the pre-proposal review process, an additional *ad hoc* Pre-proposal Science Panel conducts an independent peer-review and incorporates an assessment of all other reviews to make recommendations for development of full proposals. As a result of this process, approximately one-third to one-half of submitted pre-proposals are invited for development as full proposals. Full proposals are subsequently vetted by additional *ad hoc* peer review and a Full Proposal Science Panel as described below.

Based on topical areas of full proposals received, referees are sought from accredited institutions of higher education worldwide. A minimum of three peer-reviews are sought per proposal. A Full Proposal Science Panel is formed with appropriate expertise to undertake final review and selection of proposals for funding. All Full Proposal Science Panel members receive copies of all full proposals submitted. Each panel member is asked to review and lead the panel in a discussion as a primary reviewer for several proposals and to act as secondary reviewer for several additional proposals. All panel members are asked to have a working knowledge of all full proposals submitted. Thus, each proposal is initially considered in a dialogue among the two assigned reviewers. Other panel members are invited to contribute to the discussion of each proposal once assigned panel members have presented. The number of proposals assigned to each panel member varies depending on the number of full proposals appropriate to their area(s) of expertise. Panel members are provided with the *ad hoc* peer reviews noted previously prior to the Full Proposal Science Panel meeting, i.e., prior to their arrival in Hawai‘i. This peer review/referee process mirrors the rigorous methods of the U.S. National Science Foundation and is overseen by the Hawai‘i Sea Grant program officer assigned by the NOAA National Sea Grant Office. Due to limits on available funding, many meritorious research proposals are not funded during any given funding cycle.

6.4 Program Development

Program development grants are extramural to the process described above and impart agility to the program to respond to meritorious proposals, opportunities, and challenges that emerge outside the realm addressed by the formal biennial research program. Program development funds are disbursed at the discretion of the Hawai‘i Sea Grant director when projects or actions are identified that will assist the program in serving its constituents or increasing its capacity. For example, program development grants may be awarded to attract new investigator participation in the program. Emphasis is placed on fostering proof of concept work or method validation with a relatively small award of “seed” funds that enhance project competitiveness in subsequent Sea Grant funding biennial cycles and other extramural funding opportunities (e.g., U.S. National Science Foundation). Program development grants may also be awarded to build specifically needed capacity within the university through training and other experiential opportunities.